MINUTES

Genetic Conservation Technical Advisory Committee

10:00 am – 4:00 pm. Wednesday, November 8, 2017

Forest Sciences Centre, University of British Columbia and via Skype

Members present:

Pia Smets (Chair), Sally Aitken, Charlie Cartwright, Dave Kolotelo, Michael Murray, Alan Vyse, Tongli Wang, Alvin Yanchuk.

Others:

Brian Barber, Christine Chourmouzis, Sabina Donnelly, Jon Degner, Shane Ford, Don Pigott, Rafael Candido-Ribeiro, Ward Strong, Marie Vance, Jack Woods.

Regrets:

Andreas Hamman, Jun-Jun Liu, Michael Murray, Tory Stephens

Summary of Actions

1. Dave to contact Andy Bower, Pacific Forest Region, US Forest Service regarding the status of US *ex situ* seed conservation program.
2. Michael and Charlie to provide Don with a list of putatively resistant whitebark pine parents/populations to help guide future seed collections.
3. Brian to post approved meeting minutes on GCTAC website
4. Tongli to add National Parks and Reserves to the *in situ* gap analysis.
5. GCTAC members encouraged to respond to the federal whitebark pine recovery strategy by Dec 17.
6. Shane to meet with Pia to complete GCTAC chair transition.

1. Update on Ex situ conservation program – Dave Kolotelo

Dave provided an update on *ex situ* seed collections. He introduced Joanna Walker as the Tree Seed Centre's new auxiliary cone and seed improvement technician working on seed bank and kilning projects. Progress towards obtaining representative seed samples for all commercial and non-commercial species was provided. In the past year, 235 individual tree seed samples from 13 populations were added to the bank, which now totals 563 individual collections from 55 populations. Dave acknowledged Don Pigott for making this year's collections - under a contract renewable for 3-years with the Ministry.

Charlie asked if there is need to know or consider conservation seed collections south of the border.

Action: Dave to contact Andy Bower, Pacific Forest Region, US Forest Service regarding the status of US *ex situ* seed conservation program.

Dave also provided updates on seed viability testing (X-rays) and stratification methods for whitebark pine. He recommended a pre-sowing treatment consisting of a 3-day running water soak, H_2O_2 treatment for 2-4 hours, 56 days of warm stratification followed by 112 days of cold stratification. Plan ahead. Contact Dave for details.

2. Ex-situ collections: "no country for old men" – Don Pigott

Don provided summary of the seed collections he made in 2017. Entertaining as usual with several misadventures. Species collected included Cascara, bitter cherry, dogwood, Douglas maple, and big leaf maple. He also presented

some of his other projects including offering an alder management workshop in Prince George, and efforts to protect a Grand fir stand near Waterloo Creek on Vancouver Island, and some birch trials also on Vancouver Island.

Don is also finalizing a whitebark pine best management practices guide with Randy Moody for a broad audience (forestry, mining, oil and gas, recreation). Strategies include avoid, minimize, restore and offset disturbances. Also see agenda item #7: Whitebark Pine Federal Recovery Strategy.

3. Nursery inoculations of whitebark pine – Ward Strong

Ward presented an update on this blister-rust screening project led Michael Murray with assistance from staff at the Ministry's Kalamalka Forestry Centre in Vernon. Seedlings grown from numerous parent tree collections were exposed to rust-infected gooseberry leaves in a temperature and humidity controlled chamber, and outplanted in raised nursery beds at Kalamalka. Some families exhibit genetic tolerance to the rust while others are very susceptible – based on observed needle infections, stem cankers, and survival. Resistance mechanisms are not fully understood, and no evidence of major gene resistance (yet). Scion from putatively resistant parent trees are being grafted and held in a clone bank for future breeding and testing, and, perhaps, seed production. Only 10% of these selections is estimated to be of future value. Alvin suggested using susceptible populations in future tests, as "controls" to establish a baseline and value for genetically resistant parents (e.g. R+XX).

Grafting timing and methods, including use of limber pine for root stock, was discussed. Climate conditions for seed orchards also needs to be examined. Poor results from establishing yellow cedar orchards at low elevations were noted as a case in point.

Action: Michael and Charlie to provide Don with a list of putatively resistant whitebark pine parents/populations to help guide future seed collections.

4. Whitebark pine field testing – Charlie Cartwright

Charlie provided an update on the whitebark pine field tests. Seedlings representing approx. 500 families collected throughout the species range in BC, Alberta and US have been outplanted in several high elevation sites in BC and Alberta, and at the Skimikin Seed Orchard site near Salmon Arm. Access, variable site conditions and slow growth pose significant challenges – but Charlie remains enthusiastic and optimistic that these trials will help to identify approximately 50 rust-resistant individuals.

5. Subalpine Larch – Marie Vance

Marie provided an overview of her PhD study on the range-wide genetic structure of subalpine larch (*Larix lyalli*). She collected samples from 64 populations of subalpine and western larch (for comparison). DNA was extracted (cut with a restriction enzyme, and the amplified portion of DNA was sequenced – i.e. a semi-random selection of DNA across the genome) and SNP variation analyzed. Results show there are four distinct subalpine larch populations clustered in four geographic areas.

Marie will start work as a tree breeder with the Ministry of Forests in Vernon starting in January 2018. Congratulations Marie!

6. Whitebark pine assisted migration trials and Garry Oak - Christine Chourmouzis

Christine described her and Eric Alonso travels to the whitebark pine field trials established in 2007, and last visited in 2010. Seed collected from seven provenances (from Ft St John to Oregon) were planted in eight common garden field tests: 2 sites within the species' existing range; 3 outside its existing range but within its predicted range for 2055, and 3 sites outside its current and predicted range. Trees were measured for height and survival. Results were also compared by site and seed treatment (some seeds were not stratified). The site with best survival and growth (mean height 20 cm) was Haines, Alaska, which is within the species predicted range. The poorest survival and growth (mean height 5 cm) at nearby Atlin, a harsher site outside the species predicted range.

Christine also presented results from assessments of the Garry oak provenance trial. Two field tests were established at Totem Park, UBC and the Ministry's North Arm clone bank near Cowichan Lake in 2007 and 2008, respectively. The trees at the UBC look like trees with an average height of 250 cm, and with 95% survival. The Cowichan Lake trees have been suppressed by vegetation, grazing, and a wetter climate. Their average height is only 20 cm and survival 70%, but the trees appear to be robust. The latter site was subsequently brushed by Charlie.

7. Past meeting minutes -

Pia circulated meeting minutes from the following previous meetings: 25-26/05/2015; 25/11/2015; 28/11/2016; 10/02/2017. The latter meeting included GCTAC's budget options and recommendations for fiscal 2017/18.

Motion: The minutes for the GCTAC meetings held on May 25-26, 2015, Nov 11, 2015, Nov 28, 2016 and Feb 10, 2017 are hereby approved. (Dave Kolotelo/Alvin Yanchuk) CARRIED.

Action: Brian to post approved meeting minutes on GCTAC website

8. Genetic Conservation Catalogue – Tongli Wang and Pia Smets

Tongli and Pia presented an update on the i*n situ* conservation catalogue including a revised matrix for species conservation priorities by biogeoclimatic zone. The 2004 *in situ* conservation gap analysis was updated based on improved ecological plot data, updates to BEC (version 10), updated layer of protected areas, and the addition of provincial ecological reserves, conservancy areas and recreation areas.

Results using the updated data and revised methodologies indicate that of the 226 conservation units (species x BEC zone) only 13 unit representing 5 species are inadequately covered by *in situ* reserves. The 5 species that *may* require special attention are: limber pine, water birch, western flowering dogwood, bitter cherry and cascara. However, the relatively limited ranges and small crown cover of these species would make it difficult to find a minimum cumulative cover of 2.5 ha – warranting special protection. Different evaluation criteria may be necessary and/or *ex situ* seed collections may be adequate.

Next steps include updating species distribution maps and publishing these shape files. Also, developing a web platform so the *in situ* catalogue can be updated (i.e. BEC updates, climate change), interactive, and (eventually) overlaid with *ex situ* and *intra situ* conservation status.

Action: Tongli to add National Parks and Reserves to the *in situ* gap analysis.

9. Whitebark Pine Federal Recovery Strategy

The federal government released its draft recovery strategy for whitebark pine on October 18, 2017. Comments are accepted until December 17, 2017. Who is responsible for determining destruction of critical habitat is not clear. The Ministry of Environment is preparing BC's response. The FLNRO contact is Michael Stoehr.
Brian suggested the 2009 genetic conservation strategy for whitebark pine be updated in case federal or provincial funding is subsequently made available. It was also proposed the Chief Forester could write a letter to forest licensees advising on how to best manage for whitebark pine* and reference the forthcoming best practices guide co-authored by Don and Randy.

*Post script: An article *Incorporating whitebark pine into your forestry practice* by Sybille Haeussler was just published in the ABCFP's Nov-Dec 2017 Forest Professional magazine.

Action: GCTAC members encouraged to respond to the federal whitebark pine recovery strategy by Dec 17.

10. FGC Update – Brian Barber

Brian provided an update on recent Forest Genetics Council initiatives and "hot topics". The latter included a governance and business planning streamlining initiative. Council adopted a new model that better aligns FGC

subprogram, budgets and technical advisory committees (TACs) with FGC's goals for conservation, resilience and value.

The three remaining TACs include Genetic Conservation TAC, Coastal TAC, and Interior TAC. The only significant change for GCTAC is the appointment of Shane Ford, as its new chair. Having an FGC council member serve as GCTAC chair will ensure conservation remains in front of Council and GCTAC remains aligned with FGC's strategies and goals. ITAC and CTAC are also chaired by FGC members.

Pia was thanked for chairing GCTAC since 2014. Shane and others shared their gratitude and accolades for Pia's leadership and commitment over the past few years. Brian presented Pia with a gift on behalf of council.

Action: Shane to meet with Pia to complete GCTAC chair transition.

Minutes by: Brian Barber. Revised Dec 5, 2017

Approved March 1, 2018