***Data collected in 2015***

Lixi Kong Updated 9/05/2015

# *1. HH transect Height and Leader condition*

## 1.1 Protocol

Goal was to measure tallest 5 (sometimes measured > 5) live trees in High high plots to (1) assess evidence for reliability of 2011 height data and (2) establish CHT 2015.

Heights measured in some cases to nearest cm (interpolating on scale) or (at least) to nearest 5 cm. Measures to nearest 5 cm should be very reliable- v. disciplined Ht measurements this time!

Used either short height pole where long enough (sometimes raising it and measuring the amount raised), or longer HT pole (which was always long enough).

Omitted two transects: W32 and E334.

## 1.2 Data

### 1.2.1 Raw Data

*R:\MOOSHUBB\longterm\Rawdata2015\HHtranHeightdata2015.xlsx*

Lixi made a copy of this file, and adjusted some column names so it’s legal for SAS to read:

*R:\MOOSHUBB\longterm\lixi kong\Trans\_Other2015\HHtranHeightdata2015.xlsx*

### 1.2.2 SAS data set

SAS program to read 2015 data:

*R:\MOOSHUBB\longterm\lixi kong\Trans\_Other2015\Data2015.sas*

*SAS data set:*

*R:\MOOSHUBB\longterm\lixi kong\Trans\_Other2015\hhtr15ht.ssd*

**TRAN**

**TRANSECT**

**TPLOT**

**TAG:** there are four trees we collected data in 2015, but we couldn’t find them in previous data set, the tag number could be miswritten in 2015, but we are not sure. Because our focus on 2015 data is the 5 tallest trees, so this shouldn’t influence, we should correct them in the future if we get a chance. They are:

Transect 320, plot 16, tag 387, this looks like 357;

Transect 320, plot 20, tag 1686, looks like 1689

Transect W46, plot 19, tag 799, looks like 779.

Transect W60, plot 16, tag 420, could be 720.

**SPEC:** 149 out of 150 are ABBAs, only E330, PLOT 19, tree 136 is BECO, it was identified as ABBA before 2015. This tree also has TCOND15 of “alive and well no dieback”

**HT15:** height in meters measured in 2015, sometimes was measured to nearest 5cm.

**TCOND15:** top 2 m condition. Different technicians used slightly different definition, details can be found in this file:

*R:\MOOSHUBB\longterm\lixi kong\Trans\_Other2015/top condition 2015 docx*

We will use Hana’s definition as follows:

1=straight growth, no evidence of damage to the top;

2=Evidence of leader change within 2 m of the top;

3=multiple leaders visible;

4=Dead leader

**DATE**

**NK**

**TECH**

A new canopy height file including 2015 data is also created with the SAS program:

*R:\MOOSHUBB\longterm\lixi kong\Trans\_Other2015\HHtrCHT.sas*

Canopy height master file:

*R:\MOOSHUBB\longterm\lixi kong\Trans\_Other2015\hhtr15ht.ssd.sas*

# *2. Mid to HH ABBA maximal EX*

## 2.1 Protocol

Goal- collect data to estimate max potential ext growth for Abba at mid to high-high elevations. Data were sampled on the trail of Carriage Road(CR) and South Peak (SP) .

Abba sampled had > 50% open sky in vertical 60 degree cone angle (i.e. cone traced out by line with one end at top live crown, at 30 deg to vertical, when rotated around vertical line

Locations opportunistic- required local areas with this much open sky above, Abba present, Abba lower than main canopy so protected from elements (leader death rare in areas sampled- all measurements on clear leaders)

Sample size varies among locations- mainly due to available Abba, also some time limitation at end (sampled low to high elevation)

Chose Abba with highest ext growth - NOT random sample within locations. These were Abba without tall near neighbors

Potential ext growth will depend on plant size (ht) so sampled across height range available

On CR, excellent opportunity for this sampling, because heavy equipment opened space mid 1990s when maintaining trail

On SP trail, did not have this opportunity, so nature of sample a bit different. Depended on the regular cut trail to provide wind protection.

Difference in HT between sampled trees and main canopy generally < 2m on SP (ca. 3-10 m depending on elevation, on CR), and in some cases I had to take trees in main canoopy that had no sign of leader damage in last 2 yrs

## 2.2 Data

### 2.2.1 Raw data

*R:\MOOSHUBB\longterm\Rawdata2015\PotExtGrAbbaAug2015.xlsx*

Lixi made a copy of this file, and adjusted some column names so it’s legal for SAS to read:

*R:\MOOSHUBB\longterm\lixi kong\Trans\_Other2015\ PotExtGrAbbaAug 2015.xlsx*

### 2.2.2 SAS data set

SAS program to read 2015 data:

*R:\MOOSHUBB\longterm\lixi kong\Trans\_Other2015\Data2015.sas*

SAS data set:

*R:\MOOSHUBB\longterm\lixi kong\Trans\_Other2015\abba15ex.ssd*

**ELEV:** elevation in meters

**HThalfM:** Height collected

**EX\_cm:** extension growth in cm.

**Location:** CR= Carriage Road ; SP= South Peak