***Transect Data History 1987-2011***

Lixi Kong 9/05/2015

Contents

[*1.* *East, West, and North Transect Established in 1987* 3](#_Toc306887472)

[*1.1 Data collected in 1987* 3](#_Toc306887473)

[*1.2 Data collected in 1998:* 4](#_Toc306887474)

[*1.3 Data collected in 2010* 5](#_Toc306887475)

[*1.4 Data collected in 2011:* 5](#_Toc306887476)

[*1.5 Questions/Problems about Old Data:* 6](#_Toc306887477)

[*2. Negative, High-high, and South Transects established in 1999* 7](#_Toc306887478)

[*2.1 Tree/Sapling Data* 7](#_Toc306887479)

[*2.1.1 Tree/Sapling Data collected in 1999* 8](#_Toc306887480)

[*2.1.2 Tree/Sapling Data collected in 2000* 9](#_Toc306887481)

[*2.1.3 Tree Data collected in 2010* 9](#_Toc306887482)

[*2.1.4 Tree/Sapling Data collected in 2011* 10](#_Toc306887483)

[*2.1.5 Questions/Problems about Old Data* 13](#_Toc306887484)

[*2.2 Seedling Data* 13](#_Toc306887485)

[*2.2.1 Seedling Data collected in 1999* 13](#_Toc306887486)

[*2.2.2 Seedling Data collected in 2000* 14](#_Toc306887487)

[*2.2.3 Questions/Problems about Old Data* 14](#_Toc306887488)

[*2.2.4 Seedling Data collected in 2011* 15](#_Toc306887489)

[*2.3. Substrate Data* 17](#_Toc306887490)

[*2.3.1 Data collected in 1999* 17](#_Toc306887491)

[*2.3.2 Data collected in 2011* 17](#_Toc306887492)

[*2.4 Plant Cover Data* 18](#_Toc306887493)

[*2.4.1Data collected in 1999* 18](#_Toc306887494)

[*2.4.2 Data collected in 2011* 18](#_Toc306887495)

[*2.5 Witness Tree Data 1999* 18](#_Toc306887496)

[*2.6 Data didn’t get re-measured in 2011* 18](#_Toc306887497)

[*2.6.1Destructive Plots Data 1999* 18](#_Toc306887498)

[*2.6.2Destructive Plots Canopy Height Data 2000* 18](#_Toc306887499)

[*2.6.3GLI Data 2000* 19](#_Toc306887500)

[*2.6.4Trap Data 2000* 19](#_Toc306887501)

[*3. Mater files created in 2011* 20](#_Toc306887502)

[*3.1 Tree/sapling master file 1987~2011* 20](#_Toc306887503)

[*3.2 Tagged Seedling master file 1999~2011* 23](#_Toc306887504)

[*3.3 Seedling count master file 1999~2011* 23](#_Toc306887505)

[*3.4 Substrate master file 1999~2011* 23](#_Toc306887506)

# 1986 extensive transect data: never entered. We have soil data and a rough location of them on topo map.

# *Tree and Sapling data*

## *1.1 East, West, and North Transect Established in 1987*

*Plot 1~15 on E320, E330, E334, E335, W32, W46, W60, W70, and N326*

*First sampled in 1987; all re-sampled in 1998; then re-sampled in 2010, EXCEPT N326. N326 was re-sampled in 2011.*

### *1.1.1Tree Data collected in 1987*

SAS data set: [R:\MOOSHUBB\longterm\Permplots\Permplot98\mas98.ssd](../../Permplots/Permplot98/mas98.sas7bdat) (this file has permanent tree/sapling, and transect tree data collected in 1987 and 1998)

PLOT: Transect Azimuth in degrees.

SUBPLOT transect plot numbers

SOIL: H (Histosol) or S (Spodosol).

SLOPE: slope of each transect plot in percentage.

TAG: All live and dead trees (dbh ≥5cm) were tagged. Tag numbers are 1, 2, or 3 digits.

SPECIES: 1987 Species identification. Some got corrected in1998; we started to use SPFINAL since 1998.

DBH: DBH measured in 1987, for both live and dead trees.

YRMORT : Dead trees were given a “1987” for YRMORT.

CRPOS: Crown position measured for red spruce (PIRU) in 1987. (Other species have CRPOS of “0” in mas98.ssd, which was set as “.” In data sheet for 2011 data collection).

DECM/DECW: Decline class measured for red spruce in 1987. (Other species have DECM/DECW of “0” in mas98.ssd, which were set as “.” In data sheet for 2011 data collection)

NOSAP: number of PIRU saplings (dbh < 5cm and ht >=1m) in each transect in 1987. Recorded more than once for each plot (should only has one record for each plot though).

DISTANCE: Distance to witness trees from the center stake. (“0” values were set as “.” in data sheet for 2011 data collection)

AZ: Azimuth to the witness trees from the center stake. (“0” values were set as “.” in data sheet for 2011 data collection)

ELEV87: Elevation of the plot recorded at least five minutes after arrival.

ELEVATIO: Some of the values are different from ELEV87. We started to use GPS to measure elevation since 1998 which is more precise, so trust ELEVATIO, and can ignore ELEV87.

ASP: Azimuth down the fall line

MICRO: Micro-relief of the plot (visual estimate) 1-concave, 2-convex, 3-planar

HERB: An estimate of the % Herb cover on the transect plot based on 100%.

HERB1: Most abundant herb species.

HERB2: Second most abundant herb species.

HERB3: Third most abundant herb species.

Herb codes: 1= oxmo; 2 = clbo; 3= drsp/drin; 4= removed as a code when drsp and drin combined; 5= Lylu; 6= Coca; 7= Arnu; 8= Asspp; 9= Trbo; 10= Caspp ; 11= moss (any type); 12= Cogr; 13= Sospp; 14= Euru snakeroot

SHRUB1: Shrub species most abundant on transect plot.

SHRUB2: Second most abundant shrub species on transect plot

SHRUB3: Third most abundant shrub species on transect plot

Shrub codes: 1= vial, hobble bush; 2= acsa Mt. maple; 3= acpe striped maple; 4= sapu red-berried elder; 5= rubus raspberry or blackberry; 6= rigl skunk current; 7= Saca elderberry

### *1.1.2 Tree Data collected in 1998*

*Re-visited all transect plots established in 1987, and new trees were tagged*

TAG: New alive trees were tagged, and tag numbers all start with “98”

SPFINAL: Corrected species. We will use this for all data collection afterwards.

DBH98: DBH measurements in 1998

YRMORT: 1998 for trees which were dead in 1998.

DISTANCE: Distance to witness trees from the center stake.

AZ: Azimuth to the witness trees from the center stake.

SAPLINGS: Number of saplings for each species in the transect plot. The data were recorded for trees with “0” tag numbers which don’t exist. These “0” trees were just created to record number of sapling data.

* E330, plot10 has two values for ABBA sapling count, one is 3, the other is 30, checking hard copy, it should be 30. Corrected this in 2011 master file
* E330, 14, no tag 0s, checking hard copy, it should be: ABBA 38, BECO 3. Corrected this in 2011 master file

### *1.1.3 Tree Data collected in 2010*

*Revisited all West and East transect plots established in 1987 and new trees were tagged; also some 1999 established negative transect plots. All trees which were still alive in 1998 were collected for DBH and survivorship data, except a few are missing; Trees dead in 1998 were collected for survivorship data when they came alive in 2010; No trees dead in 1987 were included in 2010 data sheet except one which got sampled by accident and come alive in 2010 (E334, PLOT 15, ABBA 793)*

SAS data set: [R:\MOOSHUBB\longterm\lixi kong\transect2010\trans10.ssd](../transect2010/trans10.sas7bdat)

TAG: some trees were retagged in 2010. New trees were also tagged.

SPFINAL: species for new trees were identified.

DBH2010: DBHs were measured for all live trees in 2010.

SLOPE10\_D: Some of the plots were re-measured for slopes in degrees in 2010

SLOPE10\_P: These plots were also re-measured for slopes in percentage in 2010. Slope re-measurement raw data see [R:\MOOSHUBB\longterm\lixi kong\transect2010\ Clinometer Readings](../transect2010/Clinometer%20Readings.xls)

NOTE10:

“D” - dead. “N/A” -not available. When updating YRMORT, both “D” and “N/A” are considered as “dead in year 2010”.

“RL”-trees those were relabeled this year. Details see “Corrections2010updated”. Old tag numbers were retained in 2010 data set. After merging with old data, these number got updated in final master file.

“CA” - trees which were dead before but come alive this year. They are Abba, Piru, or Beco. YRMORT were corrected.

“PTG”-Previous tagged plants. Tagged tree found in the plot, but no data were recorded in previous year’s data set. Relevant data were collected this year

Details about note and relevant corrections see “[Corrections2010updated](../../RawData2010/Corrections2010.xlsx)”.

### *1.1.4 Tree Data collected in 2011:*

*Revisited 15 plots on N326 in 2011, and tagged new trees. Data were also collected on 1999 established plots which will be explained later*

SAS data set: [R:\MOOSHUBB\longterm\lixi kong\Transect2011\ntranmas11.ssd](ntranmas11.sas7bdat)

TAG: New trees were tagged in 2011

SP: tree species

DBH11: DBH re-measurements for 2011 newly tagged trees only.

STAT11: Recorded status in 2011 for both newly/previously tagged trees. To update YRMORT. A=alive; D=dead; NF=not found, assuming dead.

COND11: Conditions for both live and dead trees. H=healthy; UH=unhealthy; SD=standing; SN=snapped; LN=leaning; TI=fallen.

DIST: Measured for live trees in 2011, this was only measured for witness tree before.

HR: Measured for live trees in 2011, this was not recorded before.

AZ: azimuth in degrees for new witness trees.

NK11: Note keeper

TECH11: Technician

### *1.1.5 Questions/Problems about Old Data:*

According to 87 protocol “The north transect is identical to the east and west transects except that additional spruce data are collected. The number of live and dead spruce within five meters of the trail are tallied and given a visual estimate of size class.

Notes found on hard copy: tally # spruce live and dead along the transect line 5 meters each side. Visual estimate of size class: 1=5~10; 2=10~20; 3=20~30; 4=30+

Found some data on printed hard copy. Some of the data were entered. See file [addn326](addn326.xls) 06/01/2012

## *1.2 Negative, High-high, and South Transects established in 1999*

E320: Plot 16~20

E330: Plot -1; 16~19

E334: Plot -3~-1; 16~20

E335: Plot -4~-1; 16~18

W32: Plot -6~-1; 16~19

W46: Plot -4~-1; 16~20

W60: Plot -3~-1; 16~20

W70: Plot -5~-1; 16~21

S26: Plot 1~4; plot 14~19

S344: Plot 3~19; plot 20~24 (HH)

*1999 & 2000 transect Data were NOT merged into mas98.ssd. All the raw data are located at “*[*R:\MOOSHUBB\longterm\Transects\Tran1999\rawdata\_1999*](../../Transects/Tran1999/rawdata_1999)*”, and “*[*R:\MOOSHUBB\longterm\Transects\Tran1999\rawdata\_2000*](../../Transects/Tran1999/rawdata_2000)*”.*

*SAS data codes created by Kevin which edit and merge 99/00 data are located at “*[*R:\MOOSHUBB\longterm\Transects\Tran1999\Edit\_Update*](../../Transects/Tran1999/Edit_Update)*” These codes were rerun by Lixi in 2011 to create permanent SAS data sets.*

*Only Trees (DBH≥ 5 cm) were sampled in Negative plots, S26, and S344 plot 3~19. Tree/sapling data were collected in all “high-high elevation” transect plots, which are East & West Side plots with plot numbers larger than 15, and South Side plot S344, plot 20~24.* *All trees would be tagged in a 4m or 5m radius area.* *A maximum of 30 saplings (taller than 1 m with a dbh < 5 cm) were tagged in the 5 m radius plot in which the trees were tagged. Saplings were tagged starting with a 1 m radius plot, increasing the plot size by 0.5 m increments until at least 30 saplings of each species was tagged*

*All high-high transect plots were re-visited in 2000. NO new trees/saplings tagged in 2000 (E334, plot 16 tree 31~48 were found tagged in2000 but missing in 1999 data. CII, HR, DIST were collected for them in 2000, but status missing, assuming they were all alive in 2000). All negative transect plots and S344, plot 3~15 were re-sampled and new trees (No new saplings) were tagged in 2010. All high-high plots and S344 plot 16~24 were re-sampled in 2011.*

### *1.2.1 Tree/Sapling Data collected in 1999*

***SAS data sets:***

*R:\MOOSHUBB\longterm\Transects\Transect analysis 2010\tranext2000.ssd (data for 1999-2000)*

*R:\MOOSHUBB\longterm\Transects\Tran1999\Datasets\tplot99.ssd (Some plot level data collected in 1999)*

**TRANAZ**: Transect Azimuth in degrees.

**PLOT:** transect plot numbers

**ELEVATIO**: elevation in meters

**SLOPE**: plot slope in percentage? Unites were inconsistent. We will need to re-measure them in the future.

**ASP**: Azimuth down the fall line

**PLOTRAD**: Plot areas where trees were tagged. All negative transect plots; E335 plot 16~18; All plots on S26, S344 plot 3~19 and W46 plot 17~20 used a 5 m radius plot; the others used a 4m radius plot. **W46, plot 17, 18 and 20 actually have PLOTRAD of 4, but was recorded in old SAS file from Kevin as 5. David and Lixi discovered this during 2011 field season and data checking in 2014, and will correct this.**

**ABBARAD**: plot area where ABBA saplings were tagged, which has maximum of 5m, meaning the area between 1m and 5m?. Other species were comparatively rare (none of them had 30 between the 1m and 5m plot), so plot areas for them were not recorded, and assumed are all between 1m and 5m. **W46, plot 18 and 20 should have ABBA RAD of 4,** **but was recorded in old SAS file from Kevin as 5. David and Lixi discovered this during 2011 field season and data checking in 2014, and will correct this.**

Saplings were not tagged in all negative plots, S344 PLOT 3~19, so they have ABBARAD missing. Not sure about that for S26, found a few saplings on S26 (plot 4, 14, 15, 19). Some have ABBARAD=5, the rest are missing. We will not use sapling data from S26 for density purpose since we are not sure if we tagged all saplings there.

**SAP1, SAP2, SAP3, SAP4, SAP5, SAP7, SAP16, SAPN**: saplings counts data for each plot. The number represents tree species code. SAPN has some extra notes about other sapling species count. One is”DOGWOOD 4” Cross checked these counts with number of tagged saplings for HH, they are very inconsistent!! Those have CNTTAG and CNT, for ABBA, ABBARAD should probably be 5. It looks like 0 should be missing data, and the few count data for ABBA might be count of ABBA in the entire 5m radius area. ***We decided we’ll not use the CNT data we found since we are not sure about how these data were collected.***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| TRAN | TPLOT | SPEC | ABBARAD | CNTTAG | CNT |
| E320 | 16 | ABBA | 2 | 31 | 69 |
| E320 | 16 | BECO | 2 | 6 | 0 |
| E320 | 17 | ABBA | 4 | 33 | 0 |
| E320 | 17 | BECO | 4 | 3 | 0 |
| E320 | 18 | ABBA | 4 | 6 | 0 |
| E320 | 19 | ABBA | 4 | 38 | 0 |
| E320 | 19 | BECO | 4 | 1 | 0 |
| E320 | 20 | ABBA | 4 | 9 | 0 |
| E330 | 16 | ABBA | 4 | 18 | 0 |
| E330 | 16 | BECO | 4 | 3 | 0 |
| E330 | 17 | ABBA | 4 | 11 | 0 |
| E330 | 17 | BECO | 4 | 11 | 0 |
| E330 | 18 | ABBA | 4 | 8 | 0 |
| E330 | 18 | BECO | 4 | 6 | 0 |
| E330 | 19 | ABBA | 4 | 5 | 0 |
| E334 | 16 | ABBA | 1.5 | 46 | 0 |
| E334 | 17 | ABBA | 4 | 4 | 0 |
| E334 | 18 | ABBA | 4 | 5 | 0 |
| E334 | 19 | ABBA | 4 | 6 | 0 |
| E334 | 19 | BECO | 4 | 3 | 0 |
| E334 | 20 | ABBA | 4 | 38 | 0 |
| E335 | 16 | ABBA | 5 | 17 | 0 |
| E335 | 18 | ABBA | 5 | 7 | 0 |
| E335 | 18 | BECO | 5 | 12 | 0 |
| S344 | 20 | ABBA | 4 | 1 | 0 |
| S344 | 21 | ABBA | 4 | 28 | 0 |
| S344 | 21 | BECO | 4 | 6 | 0 |
| S344 | 22 | ABBA | 4 | 35 | 0 |
| S344 | 23 | ABBA | 4 | 17 | 0 |
| S344 | 23 | BECO | 4 | 3 | 0 |
| S344 | 24 | ABBA | 2 | 34 | 158 |
| W32 | 16 | ABBA | 2.5 | 38 | 96 |
| W32 | 17 | ABBA | 4 | 37 | 0 |
| W32 | 17 | BECO | 4 | 1 | 0 |
| W32 | 17 | PIRU | 4 | 1 | 0 |
| W32 | 18 | ABBA | 4 | 20 | 0 |
| W32 | 18 | BECO | 4 | 1 | 0 |
| W32 | 19 | ABBA | 4 | 11 | 0 |
| W32 | 19 | BECO | 4 | 1 | 0 |
| W46 | 16 | ABBA | 4 | 32 | 0 |
| W46 | 18 | ABBA | 5 | 28 | 0 |
| W46 | 18 | BECO | 5 | 1 | 0 |
| W46 | 19 | ABBA | 5 | 39 | 0 |
| W46 | 19 | BECO | 5 | 4 | 0 |
| W46 | 20 | ABBA | 5 | 2 | 0 |
| W60 | 16 | ABBA | 4 | 19 | 0 |
| W60 | 17 | ABBA | 4 | 3 | 0 |
| W60 | 18 | ABBA | 4 | 33 | 0 |
| W60 | 19 | ABBA | 4 | 8 | 0 |
| W60 | 20 | ABBA | 4 | 48 | 0 |
| W60 | 20 | BECO | 4 | 1 | 0 |
| W70 | 16 | ABBA | 4 | 5 | 0 |
| W70 | 17 | ABBA | 4 | 2 | 0 |
| W70 | 18 | ABBA | 4 | 12 | 0 |
| W70 | 19 | ABBA | 4 | 24 | 0 |
| W70 | 20 | ABBA | 4 | 30 | 0 |
| W70 | 21 | ABBA | 4 | 12 | 0 |

**NOTES**

**CREW, DATE, TIME**: crew who collected data at plot level (Data in tplot9900.ssd), and when they collected them.

**TAGNO**: Both alive/dead trees and saplings were tagged in an area 4m or 5m in radius centered around the PVC stake. Saplings were tagged starting with a 1 m radius plot, increasing the plot size by 0.5 m increments until at least 30 saplings of each species were tagged.

**SPECIES:** species identifications for both trees and saplings.

**DBH**: DBHs were measured for both trees and saplings in cm in all plots. Some were recorded as 0, which should be set as missing.

**DAH:** DAHs were measured for both trees and saplings in cm only in high-high plots if available. Regression of DBH/DAH is to be done to decide if we only need to measure **DBH**. Some were recorded as 0, which should be set as missing.

**HTCLASS:** Height classes were recorded for both trees and saplings only in high high plots. Some are missing.

**STAT99**: Status as “LIVE” or “DEAD” were recorded for both trees and saplings.

**CONDITN**: Conditions for dead trees/saplings were recorded as “STANDING”, “SNAPPED”, or “LEANING”. A few are missing. And conditions for some living trees/saplings were recorded as “LEANING”, “SNAPPED”, “FORKED”, or “TOP DEAD”.

***1.2.2 Tree/Sapling Data collected in 2000***

SPECIES2: Species identifications made in 2000. Some errors were found in 2000 data and corrected according to species identified in 1999. We should use SPECIES from 1999 in further data collection.

**STAT2000**: Status recorded as “ALIVE”, “DEAD”, “NF” (not found), or “MD” (missing data). “MD” refers to trees/saplings miss 2000 data.

**CII2000:** crown illumination index, recorded as 1, 1.5, 2, 2.5, 3, 4, or 5. only recorded for live trees/saplings. E320, plot20, tree 658 miss CII2000 data.

**HOUR:** General direction from the center using the hours on a clock face as reference

Some are missing.

**METER**: Distance of the individual from the center in m. It has values of 0, 0.5, 1, 2, 3, 4, 5. Some are missing.

***1.2.3 Tree Data collected in 2010***

*All negative plots and S344 plot 3~15 were revisited in 2010, and new trees were tagged:*

E330: plot -1

E334: plot -3 ~ -1 (Re-measurements were done in the same year.)

E335: plot – 4 ~ -1

W32: plot – 6 ~ -1

W46: plot – 4 ~ -1

W60: plot -3 ~ -1

W70: plot -5 ~ -1

S344: plot 3~15

***SAS data set:*** *R:\MOOSHUBB\longterm\lixi kong\transect2010\trans10.ssd*

**SPFINAL**: Species were identified for new trees in 2010

**DBH2010:** DBH measurements for all live trees

**NOTE10:** D=dead; N/A=not found; RL=trees retagged in 2011; ND=trees come alive in 2010; MD=tagged trees found in plot, but missing from old data. Relevant details see “Corrections2010updated”

**SLOPE10:** Some plots got re-measured for slope in degrees and percent.

### *1.2.4 Tree/Sapling Data collected in 2011*

*All East & West high-high transect plots and S344 plot 16~24 were re-sampled in 2011* ***About E335****: In June (Data collected on Jun.17 and 20, and entered on Jun.24), field crew sampled plot 15 and 16 but thought they were plot 17 and 18. Then in August, they sampled actual plot 17 and 18. They resampled old trees in plot 15, and also tagged saplings which we never tagged in regular transect plots before. This already got corrected in excel raw data and SAS data.*

E320: Plot 16~20

E330: Plot 16~19

E334: Plot 16~20

E335: Plot 15, 16~18

W32: Plot 16~19

W46: Plot 16~20

W60: Plot 16~20

W70: Plot 16~21

S344: Plot 16~24

***SAS data set:*** *R:\MOOSHUBB\longterm\lixi kong\Transect2011\trsaptree9911.ssd*

TAG: Tag new trees in 4m/5m radius areas decided in 1999. Since saplings in 1999 might grow into trees, so starting with 1m radius area, tag new saplings until there are at least 30 tagged saplings for each species in a plot. So me old tag numbers were corrected in 2011 too.

ELEV11: Garmin elevation in ft and trimble elevation in meter. Not measured for all plots.

SLOPE11: slope in degrees. Not measured for all plots.

ASP11: in degrees. Not measured for all plots.

ABBARAD11: New sapling radius in 2011. S344, plot 20, ABBARAD was changed from 4 to 3 in 2011 due to fir wave aftermath; W46, plot 17, it was changed from 5 to 4.

PLOTRAD11: New plot radius in 2011. Only W46, P17 PLOTRAD changed from 5 to 4.

SPECIES: species identifications for new trees and saplings and some species got corrected.

DBH11: Re-measure DBHs for both trees and saplings.

DAH11: Re-measure DAHs, NOT done for south transect regular plot 16~19.

HTCL11: Re-estimate Height classes in meter intervals for trees (eg. 5-6), and in 0.5m intervals for saplings (eg. 1-1.5). NOT done for South transect regular plot 16~19. Some were recorded as “9+” rather than a range; some were recorded as a single number such as “5”, which was an estimation of height (W60, P20 in early field season). After looking at data collected in 2015, we decided at least some of the HTCL11 was overestimated, probably crew didn’t always use a height pole. We should probably not use height data from 2011.

STAT11: Record Status of trees/saplings in 2011. A=alive; D=dead; NF=not found assumed dead; PD=possibly found, dead. (Untagged individual found at the same location dead); PF=possibly found, alive (Untagged individual found at the same location, alive). Status were not always recorded for individuals which were dead in 2000.

COND11: Record Conditions for both live and dead trees/saplings and if applies. H=healthy; UH=unhealthy; SD=standing dead; SN=snapped<crown base; TI=tipped up; LE=leaning >20° from vert; FO=forked main stem (tag all if forked <dbh and put a note on data sheet). Standardize FO

SNHT11: Snap height, created basing on relevant notes made in 2011. IF “BASE” set SNHT11 as 0.5=<0.5; if a range, take the middle value; if top, take the middle value of ht class.

CII11: Re do CII estimation in 2011. NOT done for South Transect regular plot 16~19.

HOUR: Relevant corrections were made on old HR data; some new HR data were collected also.

DIST: Relevant corrections were made to old DIST data; some new DIST data were also collected. Some witness trees have more precise distance measurements.

WITNESS: Created basing on field crew’s notes. 1=witness tree; missing for all the other individuals.

AZ: Azimuth values for witness trees.

NOTES11: Some notes are extra information. Some notes might lead to change in master file, which got standardized in data management and basing on which “TransCorrection2011.xlsx” was created. Details can check this file.

Other NOTES11 in codes:

* MNG: Minimal new growth
* FO(###) : forked with ### tree
* AT/@ ## (m): snapped at ## meters, basing on with SNHT11 was created.
* ALONG ##: The actual length of the stem if ## cm.
* NL:new leader
* NR: new recruit

NK11/TK11: All recorded on hard copies, NOT all entered as excel file.

WITNESS: Created by Lixi according to field crew’s notes. 1=witness tree.

AZ: Azimuth values for witness trees,

### *1.2.5 Questions/Problems about Old Data*

* According to “High Extension protocol”, “high-high elevation” plots would have elevations higher than 1219m, which are East & West Side plots with plot numbers larger than 15, and South Side plot S344, plot 20~24. However, W32 plot 16 has elevation of 1189; and W70 plot 16 has elevation of 1205. Similarly, negative plots would have elevations lower than 762, but W32, -1, -2; W70 -1 have elevations higher than 762m. And S26, plot 19 and E320 plot 20 have elevations of 0.
* Duplicated tag numbers: W32, plot 18, two trees have tag number of 512. E335, plot 16, two trees have tag number of 990862. We should field check them and see if we need to retag them.
* More research is needed on reasons why some data are missing.

## *1.3 Tree/sapling master file 1987~2011*

SAS program: R:\MOOSHUBB\longterm\lixi kong\Transect2011\TRSAPTRMAS11.sas

SAS data set: [*R:\MOOSHUBB\longterm\lixi kong\Transect2011\trsaptrmas11.ssd*](trsaptrmas11.sas7bdat)

For details of available/missing data in each census year, see data availability table:

*R:\MOOSHUBB\longterm\lixi kong\Transect2011\TRMISS.pdf* (all species included)

*R:\MOOSHUBB\longterm\lixi kong\Transect2011\TRMISS\_Abba.pdf*

*R:\MOOSHUBB\longterm\lixi kong\Transect2011\TRMASS\_Beco.pdf*

**TRAN:**

**TPLOT**

**SPEC:** 3 plants don’t have SPEC. They are included in field check file for future checking

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TRAN | TPL | TAG | SPEC | YRTAG | STAT98 | STAT00 | STAT10 | STAT11 | Dbh10 | HR | WITN |
| E334 | 16 | 704 |  | 2011 |  | ALIVE |  | ALIVE |  | 2 | 1 (witness tree) |
| E335 | 3 | 9090 |  | 2010 |  |  | ALIVE |  | 10.3 |  |  |
| N326 | 7 | 98608 |  | 1998 |  |  |  | DEAD |  |  |  |

**TAG:** In 1987, both live and dead trees (DBH>=5cm) were first tagged on East, West, and North transect plot 1~15; in 1998, new live trees were tagged on East West, and North transect plot 1~15; in 1999, both live and dead trees and saplings were first tagged on all plots on S26 (we found a few tagged saplings on S26, but since we are not sure if all saplings were tagged, we’ll not use sapling data from S26 for density analysis), plot 20~24 on S344, and East, West transect plots 16~, and only live and dead trees were first tagged on negative transect plots and S344 plot 3~19; in 2010, new live trees were tagged on East and West transect plot 1~15, all negative plots, and S344 plot 3~15; in 2011, new live trees and saplings were tagged on East and West transect plot 16~ and plot 20~24 on S344, and new live trees were tagged on S344 plot 16~19, and North transect plot 1~15.

***Duplicated tag numbers:*** In 2011, S344 plot 24, and old tree 884 was “tagged as 990389” with a note” no tag same location”, no data recorded. Then on the new recruitment sheet, a new ABBA was tagged with the same tag number 990389. Change tag number to 990389.1 for the 2011 tagged plant, and will field check this in the future.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TRAN | TPL | TAG | SPEC | YRTAG | STAT99 | STAT11 | Dbh99 | Ht99 | Dbh11 | Ht11 | NOTE11 | HR | DIST |
| S344 | 24 | 990389 | ABBA | 2011 |  | ALIVE |  |  | 6.2 | 2.5 |  | 3 | 1.5 |
| S344 | 24 | 990389 | ABBA | 1999 | ALIVE | ALIVE | 6.2 | 3.5 |  |  | POSSIBLY 884;TAGGED AS 990389, NO TAG. SAME LOCATION | 1 | 4 |

***Missing tag:*** One plant misses tag number (we probably can’t do anything with it)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| TRAN | TPL | TAG | SPEC | YRTAG | STAT11 | COND11 | NOTE11 |
| N326 | 14 |  | BECO | 2011 | DEAD | standing | Nail, but no tag |

**YRTAG**: The first time a plant was given a tag number. If a plant was retagged with a new tag number, YRTAG is the year the new tag was given. Some plants were retagged in 2010.

**YRREC**: influenced by tagging method in different years.

**STAT87**: ALIVE or DEAD for regular East, West, and North transect trees tagged in 1987. It was created basing on YMORT and CENSUS1 data from mas98.ssd. It’s available for all 1987 tagged trees.

**STAT98:** ALIVE, DEAD, MD, or CUT for regular East, West, and North transect trees tagged in 1987 and 1998 (only newly tagged live trees in 1998). Created basing on YMORT and CENSUS1 data from mas98.ssd. If a plant is dead in 1987 and not come back alive in 1998, it always has a STAT98 equal to DEAD as well.

***Missing STAT98:***

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| tran | tpl | tag | yrtag | Stat87 | NOTE98 | Stat10 | Stat11 | Yrmort | Notes Lixi |
| N326 | 7 | 98608 | 1998 |  |  |  | DEAD | 2011 | We probably forgot to collect data in 1998. Add STAT98=’ALIVE’ |
| E320 | 9 | 327 | 1987 | ALIVE | Tree cunt down by trail | DEAD |  | 1998 | Add STAT98=’CUT’ |
| E320 | 9 | 382 | 1987 | ALIVE | Tree cunt down by trail | DEAD |  | 1998 | Add STAT98=’CUT’ |
| E320 | 9 | 530 | 1987 | ALIVE | Tree cunt down by trail | DEAD |  | 1998 | Add STAT98=’CUT’ |
| E320 | 9 | 580 | 1987 | ALIVE | Tree cunt down by trail | DEAD |  | 1998 | Add STAT98=’CUT’ |
| W60 | 12 | 935 | 1987 | ALIVE |  | DEAD |  | 2010 | We forgot to collect data in 1998. Add STAT98=’MD’ |
| W70 | 7 | 759 | 1987 | ALIVE |  | NF |  | 2010 | We forgot to collect data in 1998. Add STAT98=’MD’ |

**STAT99**: ALIVE or DEAD, collected for high-high, negative, and South side transect trees and saplings tagged in 1999.

***Missing STAT99:***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| tran | tplot | tag | yrtag | Stat10 | Notes Lixi |
| S344 | 3 | 991383 | 1999 | ALIVE | Add STAT99=’ALIVE’ |

**STAT00:** ALIVE, DEAD, MD or NF, collected for high-high transect trees and saplings tagged in 1999. . If a plant was dead in 1999 and not come back alive in 2000, it always has STAT00=DEAD

***Missing STAT00:***

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| tran | tplot | tag | spec | yrtag | Stat99 | DBH99 | HT99 | Stat11 | Yrmort | Notes Lixi |
| E330 | 17 | 133 | BECO | 1999 | ALIVE | 3.2 | 3.5 | DEAD | 2011 | Add MD for STAT00 |
| E334 | 20 | 63 | ABBA | 1999 | ALIVE | 2.7 | 2.5 | NF | 2011 | Add MD for STAT00 |
| E334 | 20 | 73 | ABBA | 1999 | ALIVE | 3.1 | 2.5 | NF | 2011 | Add MD for STAT00 |
| E335 | 17 | 121 | ABBA | 1999 | ALIVE | 2.68 | 1.75 | PD | 2011 | Add MD for STAT00 |
| E335 | 17 | 163 | ABBA | 1999 | ALIVE | 2.15 | 2.5 | ALIVE | . | Add ALIVE for STAT00 |
| E335 | 17 | 734 | ABBA | 1999 | ALIVE | 3.1 | 2.5 | PD | 2011 | Add MD for STAT00 |
| E335 | 17 | 778 | ABBA | 1999 | ALIVE | 2.1 | 2.5 | ALIVE |  | Add ALIVE for STAT00 |
| S344 | 21 | 149 | ABBA | 1999 | ALIVE | 2.77 | 2.5 |  |  | Add MD for STAT00 |
| W60 | 18 | 993020 | ABBA | 1999 | ALIVE | . | 1.25 |  |  | Add MD for STAT00 |
| W60 | 18 | 993544 | ABBA | 1999 | ALIVE | . | 1.25 | DEAD |  | Add MD for STAT00 |

***Plants come back live in 2000:***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TRAN | TPLOT | TAG | SPEC | YRTAG | STAT99 | STAT00 | STAT11 | DBH99 | DAH99 | HTCL99 | COND99 | CII00 | COND11 |
| E334 | 20 | 46 | ABBA | 1999 | DEAD | ALIVE | DEAD | 5.1 | 5.8 | 2-3 | SD | 2 | SD |
| S344 | 23 | 938 | ABBA | 1999 | DEAD | ALIVE | DEAD | 5.4 |  | 4-5 | SD | 3 | SN |

**STAT10:** ALIVE, DEAD, MD or NF, collected for regular East and West (tagged in 1987, 1998, or newly tagged in 2010), negative plots and S344, plot 3~15 (tagged in 1999 or newly tagged in 2010) that were still ALIVE from last census. This was created basing on NOTE from 2010 field data A DBH would be recorded if a plant is ALIVE, and a D would be recorded for dead plant, and a NA or N/A would be recorded if it’s NF. Some other notes might be made for NOTE in field too. . If a plant was DEAD in 1998 or 1999 or 2000, it was ***NOT*** always checked for STAT.

***Missing STAT10:***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PLOT | SPLT | TAG | SPEC | TAGYEAR | STAT87 | STAT98 | STAT99 | DBH87 | DBH98 | DBH99 | NOTEs Lixi |
| E330 | 9 | 98487 | ABBA | 1998 |  | ALIVE |  |  | 5 |  | All Add MD for STAT10 |
| E334 | 15 | 98793 | ABBA | 1998 |  | ALIVE |  |  | 5.1 |  |  |
| S344 | 5 | 991357 | ACSA | 1999 |  |  | ALIVE |  |  | 5.6 |  |
| S344 | 7 | 991174 | ACSA | 1999 |  |  | ALIVE |  |  | 45 |  |
| W46 | -4 | 990351 | BECO | 1999 |  |  | ALIVE |  |  | 6.6 |  |
| W46 | -4 | 990365 | BECO | 1999 |  |  | ALIVE |  |  | 7.3 |  |
| W60 | 2 | 745 | ABBA | 1987 | ALIVE | ALIVE |  | 5.5 | 7.2 |  |  |

***Plants come back live in 2010. Original files from data logger were checked:***

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PLOT | SPLT | TAG | SPEC | TAGYEAR | STAT87 | STAT98 | STAT10 | YRMORT | DBH87 | DBH10 | NOTE98 | NOTE |
| 32 | 5 | 457 | ABBA | 1987 | ALIVE | NF | ALIVE | 1998 | 5.1 | 10.6 |  |  |
| 32 | 6 | 430 | ABBA | 1987 | ALIVE | NF | ALIVE | 1998 | 8.5 | 15.6 |  |  |
| 32 | 14 | 859 | ABBA | 1987 | ALIVE | NF | ALIVE | 1998 | 9 | 10.3 |  | A cf was recorded for tree 860 which was live in 1998 |
| 46 | 6 | 508 | ABBA | 1987 | ALIVE | DEAD | ALIVE | 1998 | 6.2 | 8.2 |  |  |
| 46 | 9 | 382 | BECO | 1987 | ALIVE | NF | ALIVE | 1998 | 6.7 | 8.2 |  |  |
| 46 | 10 | 59 | BECO | 1987 | ALIVE | NF | ALIVE | 1998 | 12.3 | 13.2 |  |  |
| 46 | 10 | 64 | ABBA | 1987 | ALIVE | NF | ALIVE | 1998 | 14.8 | 19 |  |  |
| 46 | 10 | 70 | PIRU | 1987 | ALIVE | NF | ALIVE | 1998 | 6.4 | 8.1 |  |  |
| 60 | 3 | 732 | BECO | 1987 | ALIVE | NF | ALIVE | 1998 | 7.7 | 6.5 |  |  |
| 60 | 13 | 890 | BECO | 1987 | ALIVE | NF | ALIVE | 1998 | 8.6 | 9.8 |  |  |
| 70 | 9 | 236 | ABBA | 1987 | ALIVE | NF | ALIVE | 1998 | 10.4 | 13.4 |  | Cf(confirmed?) |
| 320 | 9 | 361 | BECO | 1987 | ALIVE |  | ALIVE | 1998 | 15.3 | 17.4 | CUT | Not dead |
| 320 | 11 | 526 | BECO | 1987 | ALIVE | NF | ALIVE | 1998 | 9.4 | 10.5 |  |  |
| 320 | 14 | 136 | ABBA | 1987 | ALIVE | NF | ALIVE | 1998 | 6 | 10 |  | Not dead |
| 320 | 14 | 180 | ABBA | 1987 | ALIVE | DEAD | ALIVE | 1998 | 5.8 | 6.8 |  | Not dead |
| 320 | 14 | 199 | ABBA | 1987 | ALIVE | NF | ALIVE | 1998 | 12.7 | 17.7 |  | Not dead |
| 334 | 12 | 604 | ABBA | 1987 | ALIVE | DEAD | ALIVE | 1998 | 6.2 | 6.7 |  |  |
| 334 | 15 | 793 | ABBA | 1987 | DEAD | DEAD | ALIVE | 1987 | 6.1 | 5.8 |  |  |

**STAT11:** ALIVE, DEAD, MD NF, PD, or PF for East and West HH plots and S344, plot 16~24 tagged in 1999 that were still ALIVE from previous census or newly tagged trees and saplings. E335 plot 15 was also resampled by chance. This was recorded in field as A, D, NF. It a plant was dead in 2000, it was ***NOT*** always checked for status in 2011.

***Missing STAT11***: after checking hard copy, it seems we missed these plants in 2011, and this was because for these plots, crew didn’t take data sheet with previously tagged plants, so they didn’t look specifically for all previously tagged plants.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| trans | pl | tag | spec | dbh99 | dah99 | ht99 | STAT99 | STAT00 | notes11 | Notes Lixi |
| E330 | 17 | 111 | ABBA | 9.1 | . | 5.5 | ALIVE | ALIVE |  | All Add MD for STAT11 |
| E334 | 20 | 82 | ABBA | . | 1.32 | 1.25 | ALIVE | ALIVE |  |  |
| E335 | 16 | 990862.1 | ABBA | 14.7 | 17.3 | . | ALIVE | ALIVE |  |  |
| S344 | 21 | 149 | ABBA | 2.7725448027 | 3.9 | 2.5 | ALIVE |  |  |  |
| W32 | 18 | 512.1 | ABBA | 8.8 | . | 4.5 | ALIVE | ALIVE |  |  |
| W46 | 19 | 919 | ABBA | 2 | 2.8 | 2.5 | ALIVE | ALIVE |  |  |
| W46 | 19 | 926 | ABBA | 2.1 | 3.4 | 2.5 | ALIVE | ALIVE |  |  |
| W60 | 18 | 993020 | ABBA | . | . | 1.25 | ALIVE |  |  |  |
| W60 | 18 | 993544 | ABBA | . | 2.1 | 1.25 | ALIVE |  |  |  |
| W60 | 20 | 993448 | ABBA | 2.4 | . | 2.5 | ALIVE | ALIVE | NFNC (Not Found Not Checked) |  |

***Plants come back live in 2011:***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| trans | pl | tag | spec | dbh99 | dah99 | htcl99 | stat99 | STAT00 | STAT10 | dbh11 | htcl11 | sta11 | con11 | cii11 | notes11 |
| E330 | 16 | 351 | ABBA | 2.5 | 0 | 1.5-2 | ALIVE | DEAD |  | 2.9 | 1.5-2 | A | SN | 1.5 | NL |
| E335 | 15 | 138 | ABBA | 5.2(dbh98) |  |  |  |  | DEAD | 6.3 |  |  | UH | 1.5 | No new growth |
| E335 | 17 | 990832 | ABBA | 2.4 | 3 |  | ALIVE | DEAD |  |  | 7-8 | A | H |  | TOP DEAD |
| S344 | 24 | 877 | ABBA | 0 | 2.1 | 1-1.5 | ALIVE | DEAD |  |  | 1-1.5 | A | H |  | COME ALIVE, HR=7, DIST=1 |
| W32 | 16 | 473 | ABBA | 8.9 | 0 | 5-6 | ALIVE | NF |  | 10.9 | 6-7 | A | H | 5 |  |
| N326 | 14 | 978 | ABBA | 6.7(dbh87) |  |  | NF(stat98) |  |  | 8.4 |  | A |  |  |  |

**YRDERC**: year death was recorded for a plant. If value missing, it means until the last census, a plant was still alive. We used to call this ***YRMORT***, but because of the interval we sampled, the actually year of mortality would be between the year recorded for YRMORT and previous census, so we decided to rename this.

**DBH87:** DBH measured in cm for both live and dead trees in 1987. All are greater or equal to 5.

***Missing DBH87: 18 trees.*** we can’t do anything with it, but we know they were all “trees”.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| tran | tplot | tag | spec | yrtag | stat87 | stat98 | DBH98 |
| E320 | 9 | 227 | ABBA | 1987 | ALIVE | ALIVE | . |
| E330 | 11 | 448 | PIRU | 1987 | ALIVE | ALIVE | . |
| E334 | 10 | 373 | ABBA | 1987 | ALIVE | ALIVE | 11.6 |
| E334 | 12 | 999 | ABBA | 1987 | ALIVE | DEAD | . |
| E335 | 9 | 804 | BECO | 1987 | ALIVE | DEAD | . |
| E335 | 11 | 694 | ABBA | 1987 | ALIVE | DEAD | . |
| E335 | 12 | 671 | BECO | 1987 | ALIVE | ALIVE | 7.1 |
| E335 | 12 | 673 | BECO | 1987 | ALIVE | ALIVE | 10.5 |
| N326 | 9 | 869 | ABBA | 1987 | ALIVE | ALIVE | 15.9 |
| N326 | 15 | 995 | BECO | 1987 | ALIVE | ALIVE | 6.9 |
| W46 | 5 | 941 | PIRU | 1987 | ALIVE | ALIVE | 15.5 |
| W46 | 6 | 511 | PIRU | 1987 | ALIVE | ALIVE | 12.4 |
| W46 | 9 | 316 | BECO | 1987 | ALIVE | ALIVE | 7.7 |
| W46 | 15 | 525 | ABBA | 1987 | ALIVE | ALIVE | 9.1 |
| W46 | 15 | 994 | ABBA | 1987 | ALIVE | ALIVE | 10.7 |
| W60 | 5 | 607 | ABBA | 1987 | ALIVE | ALIVE | 28.8 |
| W60 | 6 | 894 | ABBA | 1987 | ALIVE | ALIVE | 8.8 |
| W70 | 10 | 244 | BECO | 1987 | ALIVE | DEAD | . |

**DECM87:** 1~5. Crosscheck this with STAT87. When STAT87=’ALIVE’, all DECM87s are less than 4; when STAT87=DEAD, all DECM87s are equal to 4 or 5. For live tree, this was only collected for PIRU. Some 4, or 5s were collected for ABBA, BECO, and SOAM.

**DECW87:** 1~5

**CPO87:** d=dominant; c=co-dominant; i=intermediate; o=overtopped. Collected for both live and dead trees on regular transect plots, only for PIRU except 3 ABBA and 1 PRPE

**DBH98:** DBH for 1998 live regular transect trees that were tagged in 1987 or 1998. All are greater or equal to 5 except one tree had DBH98 equal to 4.8.

***Missing DBH98:*** Some plants that were “DEAD” in 1998 but come back alive in 2010 miss a DBH98, and some other plants we tagged in 1998 but forgot to collect DBH: Leave it now, we can estimate DBH98 for certain analysis such as BA. There are **22 plants** in total.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| tran | tplot | tag | spec | yrtag | stat87 | stat98 | DBH87 | NOTE98 | NOTE10 |
| E320 | 9 | 227 | ABBA | 1987 | ALIVE | ALIVE | . |  | PTG |
| E320 | 9 | 361 | BECO | 1987 | ALIVE | ALIVE | 15.3 | CUT | CA |
| E320 | 11 | 526 | BECO | 1987 | ALIVE | ALIVE | 9.4 |  | CA |
| E320 | 14 | 136 | ABBA | 1987 | ALIVE | ALIVE | 6 |  | CA |
| E320 | 14 | 180 | ABBA | 1987 | ALIVE | ALIVE | 5.8 |  | CA |
| E320 | 14 | 199 | ABBA | 1987 | ALIVE | ALIVE | 12.7 |  | CA |
| E330 | 11 | 448 | PIRU | 1987 | ALIVE | ALIVE | . |  | PTG |
| E334 | 12 | 604 | ABBA | 1987 | ALIVE | ALIVE | 6.2 |  | CA |
| N326 | 14 | 978 | ABBA | 1987 | ALIVE | ALIVE | 6.5 |  |  |
| W32 | 1 | 619 | BECO | 1987 | ALIVE | ALIVE | 5.2 |  |  |
| W32 | 5 | 457 | ABBA | 1987 | ALIVE | ALIVE | 5.1 |  | CA |
| W32 | 6 | 430 | ABBA | 1987 | ALIVE | ALIVE | 8.5 |  | CA |
| W32 | 9 | 98267 | ABBA | 1998 |  | ALIVE | . |  | PTG |
| W32 | 9 | 98274 | ABBA | 1998 |  | ALIVE | . |  | PTG |
| W32 | 14 | 859 | ABBA | 1987 | ALIVE | ALIVE | 9 |  | CA |
| W46 | 6 | 508 | ABBA | 1987 | ALIVE | ALIVE | 6.2 |  | CA |
| W46 | 9 | 382 | BECO | 1987 | ALIVE | ALIVE | 6.7 |  | CA |
| W46 | 10 | 59 | BECO | 1987 | ALIVE | ALIVE | 12.3 |  | CA |
| W46 | 10 | 64 | ABBA | 1987 | ALIVE | ALIVE | 14.8 |  | CA |
| W46 | 10 | 70 | PIRU | 1987 | ALIVE | ALIVE | 6.4 |  | CA |
| W60 | 3 | 732 | BECO | 1987 | ALIVE | ALIVE | 7.7 |  | CA |
| W60 | 13 | 890 | BECO | 1987 | ALIVE | ALIVE | 8.6 |  | CA |
| W70 | 9 | 236 | ABBA | 1987 | ALIVE | ALIVE | 10.4 |  | CA |

**Check on DBH growth 1987~1998:** Maximum DBH growth is 9 cm, and minimum if -1.6 cm. retain all the measurements, we might want to correct negative growth to 0 when we do growth analysis.

**NOTE98:** created basing on CODE98A from mas98.ssd.

* CUT: tree cut down by trail.
* PM=precise measurements. Trees measured from the tree core.
* ST1-#/ST2-# Individual sharing base with 1 or 2other stems. When it shares base with 2 or more other stems, # is the tag number of one of the other stems, as recorded for CODE98A.

**HTCL99:** Height class in 1999 for High-High dead and live saplings and trees only. 1-1.5; 1.5-2; 2-3; 3-4; 4-5; 5-6; 6-7; 7-8, 9-(**taller than 9m. 14 trees have this HTCL**). Still **around 200 plants** miss HTCL99 (around130 live).

**HT99:** Mid-point of HTCL99.

* Most live plants that miss HTCL99 has a DBH99 recorded, so HT99 is estimated basing on ***DBH/HT regression.***  For ABBA: HT=0.91+0.560\*DBH-0.014\*DBH\*DBH. For BECO, HT=1.27+0.75\*DBH-0.032\*DBH\*DBH. Then HTCL99 was created.
* 2 ABBA that were tagged in1999 but no data collected in 1999, then it was measured in 2000, NF in 2011, No relevant data can be used to estimate HT99.
* SOAM doesn’t have enough HT and DBH data to run regression.
* The estimation is for the purpose of density analysis, and for demographic analysis, we should exclude these plants. All regression are done with this program: Details can be found: longterm\lixi kong\Transect2011\HHtrEDBHEHT

**EHT99:** if HT99/HTCL99 is estimated EHT99=1, otherwise it’s missing. I removed all the estimated height for now.

**DBH99:** DBH measured for HH live and dead trees and saplings in 1999.

* For live trees that were tall enough to measure DBH (HT99 >1.37) but only had DAH measured, DBH was predicted basing on the ***regression of DBH/DAH*** (pooling DBH and DAH data from 1999 and 2011, for plants we sampled twice, only use the first measurements.). for ABBA, DBH=-0.395+0.818\*DAH (all estimation needs to be checked and updated); for BECO, DBH=-0.146+0.739\*DAH. SOAM doesn’t have relevant data to run this regression.
* If a plant miss DBH and DAH but has HT>1.37, DBH is estimated basing on ***DBH/HT regression.*** For ABBA, DBH=-2.159+HT\*2.94-0.21\*HT2; for BECO, DBH=1.19+0.91\*HT.
* If a plant miss DBH99, but have HT <1.37( HTCL <1~2), or DBH11 <5 then we assume it’s a sapling in 1999. Do not estimate DBH99
* If a plant miss all DBH, DAH and HT, but has DBH11, then DBH99 is estimated basing on ***regression of DBH/DBH growth.*** ABBA: DBHGR=1.21+0.048\*DBH99, so DBH99=(DBH11-1.2)/1.048.
* The estimation is for the purpose of density analysis, and for demographic analysis, we should exclude these plants. All regression are done with this program: Details can be found: longterm\lixi kong\Transect2011\HHtrEDBHEHT

**EDBH99:** if a DBH99 was estimated from DAH99 then EDBH99=1; if it was estimated from DBH growth, then EDBH99=2; if it was estimated from DBH-HT relationship, then EDBH99=3. SOAM doesn’t have DBH/DAH data to estimate this.

**DAH99**: When a plant is not tall enough to measure DBH, DAH was measured. Sometimes when DBH99 was measured, DAH99 was also measured.

**FORM99:** variable to indicate whether a plant was a “tree’ or “sapling” in 1999 for density purpose. After DBH99 is estimated, there are 2 plants we don’t know whether it was a sapling or tree in 1999.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TRAN | TPLT | TAG | SPEC | YRTAG | STAT11 | DBH99 | DAH99 | HT99 | DBH11 | DAH11 | HT11 | Notes Lixi |
| E334 | 16 | 38 | ABBA | 1999 | NF | . | . | . | . | . | . | Don’t know |
| E334 | 16 | 39 | ABBA | 1999 | NF | . | . | . | . | . | . | Don’t know |

**COND99:** condition for dead and live plants. FO=forked; LN=leaning; SD=standing dead; SN=snapped; TD=top dead (only 1). It’s missing for a lot of LIVE plants,

***STANDING for live plants:*** 64 live plants have a CONDITION of “STANDING”, and most of them are in W46, plot 19, it was probably a mistake, COND99 was set as missing for these plants.

***Missing COND99 for DEAD plants***: we can’t do anything with it.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| tran | tplot | tag | spec | yrtag | stat99 | dbh99 | cond11 |
| E334 | 18 | 261 | BECO | 1999 | DEAD | 19.5 | SN |
| S344 | 14 | 991197 | ABBA | 1999 | DEAD | 14.9 |  |
| W70 | 17 | 466 | ABBA | 1999 | DEAD | 13.9 | SN |

**CII00:** crown illumination index collected for LIVE saplings and trees on High-high transect in 2000. It’s missing for ***12 HH plants*** that were alive in 2000.

1=No direct light (crown is not lit directly vertically or laterally);

1.5=Low lateral light;

2=Medium lateral light;

2.5=High lateral light; All the above are similar to **“overtopped”.**

3=Some vertical light (10–90% of the vertical projection of the crown is exposed to vertical light); This is similar to “**intermediate”.**

4=Crown completely exposed to vertical light, lateral light blocked within some or all of the 90° inverted cone encompassing the crown. This is similar to **“co-dominant”.**

5=Crown completely exposed to vertical and lateral light within the 90° inverted cone encompassing the crown. This is similar to **“dominant”.**

([Clark and Clark, 1992](http://www.sciencedirect.com/science/article/pii/S0378112707000849#bib3))

**NOTE00:** Additional notes for 2000 data.

* CA: Plant came back live in 2000, created basing on STAT99 and STAT00.
* PTG: In E334 plot 16, live tree 31~48 (tree 47 was retagged as 1532 in 2011) were found tagged in 2000, but no data were recorded in 1999. Give these plant YRTAG=1999 and STAT99=ALIVE

**DBH10:** DBH collected for LIVE trees in 2010. All are equal or greater than 5 except 2 PLANTS. **4 miss** DBH10.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| tran | plot | tag | sp | Dbh87 | Dbh98 | Dbh10 | DBH11 | Notes Lixi |
| W32 | 14 | 498 | ABBA | 13.6 | 14.32 | 0 |  | Set DBH10 as missing |
| E335 | 15 | 138 | ABBA | 5 | 5.2 |  | 6.3 |  |

**Check on DBH growth for 1998~2010:** Maximum growth is 8cm, minimum is -8.1. The biggest two negative values need corrections, for BA analysis, we can use DBH estimated from growth model.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TRAN | TPLOT | TAG | SPEC | YRTAG | DBH87 | DBH98 | DBH10 | GRDBH | Notes lixi |
| E334 | 14 | 749 | ABBA | 1987 | 10.3 | 17.5 | 12.8 | -4.7 | Set DBH10 as missing |
| E334 | 12 | 656 | ABBA | 1987 | 14.1 | 15.9 | 7.8 | -8.1 | Set DBH10 as missing |

**NOTE10:**

* **CA**
* **NYR:** no year of recruitment. Only one plant.
* **PTG:** previously tagged plants but no data recorded before. YRTAG were added if only one census before current year or tag year can be guessed from other variables.
* **RL#:** plant relabeled in 2010. # is the old tag number

**DBH11:** DBH measured for live trees and saplings in 2011.

* For trees that were tall enough to measure DBH but only had DAH measured, DBH was predicted basing on the regression of DBH11/DAH11. We use the same DBH/DAH regression we used to estimate DBH99 to estimate DBH11.
* For those miss both DBH11 and DAH11 but has DBH99, DBH11 was estimated by by DBH/DBH growth regression

**EDBH11:** if a DBH was predicted, then EDBH11=1.

**DAH11:** DAH measured in 2011 mostly for live plants, only a few for dead plants on W60 plot 20.

**HTCL11:** Height class collected for LIVE plants on HH plots in 2011, which is different than HTCL99. <1; 0-0.5; 0.5-1; 1; 1-1.5; 1-2; 1.5-2; 2; 2-2.5; 2-3; 2.5-3; 3; 3-4; 3.5-4; 4; 4-5; 5; 5-6; 6; 6-7; 7-8; 8-9; 9-10; 10-11; 11-12; 12-13; 13-14; 2 plants have HTCL11 recorded as 9+(standardized as 9-). ***4 dead plants*** were also collected for HTCL. After looking at data collected in 2015, we decided at least some of the HTCL11 was overestimated, probably crew didn’t always use a height pole. We should probably not use height data from 2011.

**HT11:** mid-point of HTCL11. For ambiguous HTCL such as 9+, HT11 was set as missing; and for integer values for HTCL, which were estimations of HTs, the original values were used as HT.

**Check on HT growth 1999~2011**: maximum growth of 8, and minimum growth of -6.

E330, plot 19, tree 138, which had growth of -6 should have HTCL11 of 12-13 instead of 2-3.(it was written as 2-13 on the hard copy). This was corrected.The rest look OK.

**SNHT11:** snap height. This was created from notes recorded in field. It was usually recorded in the form of ‘at #’ with # as the snap height in m and COND11 would be SN.

***Missing DBH11/HTCL11:*** If a plant miss both DBH11 and DAH11 and have HTCL less than 1~2, we assume it’s a sapling not tall enough to measure height. Still some individuals miss both DBH and DAH and have height above 1.37. Do DBH/HT regression by ELEV (<=10cm DBH):

These plants are so short they are probably all saplings.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TRAN | TPLOT | TAG | SPEC | YRTAG | STAT99 | DBH99 | DAH99 | HT99 | HT11 | COND11 | CII11 | NOTE11 | Notes |
| E320 | 20 | 657 | ABBA | 1999 | ALIVE |  | 3.7 | 1.25 |  |  |  |  | sapling |
| S344 | 20 | 404 | ABBA | 2011 |  |  | . | . | 2.25 | H | 3 |  | They are all saplings because of small heights. |
| S344 | 20 | 431 | ABBA | 2011 |  |  | . | . | 1.75 | H | 3 |  |  |
| S344 | 20 | 433 | ABBA | 2011 |  |  | . | . | 1.75 | H | 3 |  |  |
| S344 | 20 | 434 | ABBA | 2011 |  |  | . | . | 1.75 | H | 3 |  |  |
| S344 | 20 | 435 | ABBA | 2011 |  |  | . | . | 1.75 | H | 2.5 |  |  |
| S344 | 20 | 463 | ABBA | 2011 |  |  | . | . | 2.25 | H | 3 |  |  |
| S344 | 20 | 465 | ABBA | 2011 |  |  | . | . | 1.75 | H | 3 |  |  |
| S344 | 20 | 466 | ABBA | 2011 |  |  | . | . | 1.75 | H | 3 |  |  |
| S344 | 20 | 483 | ABBA | 2011 |  |  | . | . | 1.75 | H | 3 |  |  |
| S344 | 20 | 1610 | ABBA | 2011 |  |  | . | . | 1.75 | H | 3 |  |  |
| S344 | 21 | 155 | ABBA | 1999 | ALIVE |  | . | 1.25 | 1.5 | H | 2.5 |  |  |
| S344 | 23 | 940 | ABBA | 1999 | ALIVE |  | . | 1.25 | 1.5 | H | 2.5 |  |  |
| S344 | 24 | 697 | ABBA | 1999 | ALIVE |  | . | 1.25 | 1.75 | H | 4 | WT |  |
| S344 | 24 | 870 | ABBA | 1999 | ALIVE |  | 1.315089 | 1.75 | 1.75 | H | 4 |  |  |
| S344 | 24 | 878 | ABBA | 1999 | ALIVE |  | . | 1.25 | 1.75 | H | 4 | WT (WIRE TAG, TOO SMALL TO NAIL) |  |

**Check on DBH growth for 1999~2011**: Maximum growth is 10.73, minimum is -8.9. Some corrections were made:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TRAN | TPL | TAG | SPEC | YRTAG | DBH99 | HT99 | DBH11 | HT11 | COND11 | NOTE11 | DBHGR | Corrections |
| E335 | 17 | 159 | ABBA | 1999 | 11.7 | 4.5 | 2.8 | 5.5 | H |  | -8.9 | set DBH11 as missing |
| W46 | 20 | 563 | ABBA | 1999 | 3.27 | 2.5 | 14 | 5.5 | H | FO above DBH | 10.73 | Set DBH99 as missing referring to Note11 |
| w70 | 19 | 601 | ABBA | 1999 | 5.9 | 2.5 | 4.5 | 3.5 | UH | minimal new growth;  tag moved to dbh; growing sideways | -1.4 | Set DBH99 as missing, assuming crew moved the tag to the right place in 2011( 1.37m along the stem) |
| E334 | 20 | 75 | ABBA | 1999 | 12.2 | 2.5 | 7.1 | 5.5 | H | New leading stem, main stem dead,  tag moved to new leading stem | -5.1 | Make COND11 NS (new stem) |
| E320 | 20 | 1591 | ABBA | 1999 | 2.3 | 1.75 | 1.9 | 1.75 | UH | RL648;NL, old one snapped; was #648 | -0.4 | Make COND11 NS (new stem) |

**COND11:** Condition for both dead and live plants in 2011. Categories are different than COND99. H= healthy (live only); UH=unhealthy(live only); SD=standing dead; SN=snapped(live or dead); LN=Leaning (minimal 20 degrees.live and dead); TI=fallen (live or dead); NS(new stem, which might lead to negative growth between 1999 and 2011. This was created during data checking in 2014)

**CII11:** crown illumination index collected for live plants in 2011.

***CII11 for dead plants:*** W60, plot 20, 993437 and 993464 dead but had CII11 recorded. Check hard copies, consistent. There are some other dead plants had CII11 recorded in the same plot but not entered.

**NOTE11:** additional notes. Comparing to other census years, 2011 has more abundant extra information, and it was hard to standardize all the notes, so some standardized notes were added, followed with a ‘;’ and the original notes, and some were retained as what they were. Typical standardized notes are in the categories below:

* At #: snap at certain height. SNHT11 was created basing on this and COND11 would be SN
* DEC=#: some decline class was recorded.
* FO #/ST#: forked with another plant # #/percentage of plants have this code?
* RL #=relabeled. The old tag number was #.
* TC=tag correction. Tag number recorded wrong in old data and got corrected in 2011.
* PSEED=Individuals which were seedlings in 2000 and grew into saplings in 2011.
* MNG: minimal new growth.
* NYR=no precise year of recruitment. Individuals tagged in 2011 but big enough they would have been included. So we don’t know precise year of recruitment for them
* NR: newly tagged plant. We should refer to old data and other notes to decide whether it’s a real “new recruitment”.
* NL: new leader
* NPM=no precise point of measurement. This happened when a plant is tagged with wire rather than nail.
* POSSIBLY #: possibly an old individual with tag number #. A plant found untagged at the same location as the old plant. For future data collection purpose, the new tag number was retained in the data set. Stat11 for these are PF.
* PTG=previously tagged. Individuals found tagged in 2011 but missing from old data.
* RNYR=retagged, no precise year of recruitment. Individuals found with nail but no tag and get retagged in 2011. We are sure they were tagged before, but don’t know when, what.
* TAG FOUND ON GROUND:
* WT: wire tag.
* SPECIES11=: plants with species identification different in 2011. Corrected if needed.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| TRAN | TPLOT | TAG | STAT98 | STAT11 | SPEC | NOTE11 | Notes Lixi |
| N326 | 2 | 780 | DEAD | DEAD | BECO | SPECIES11 = BESSP | Correct to BESPP. Unlikely to be a BECO at L. |
| N326 | 5 | 749 | ALIVE | ALIVE | BEAL | CHANGE SPECIES TO BEAL | No correction needed |
| N326 | 6 | 796 | DEAD | DEAD | PIRU | SPECIES11=ABBA | Change SP to ABBA |
| N326 | 10 | 896 | DEAD | DEAD | SOAM | SPECIES11=BECO | Change SP to BECO |
| N326 | 12 | 930 | DEAD | DEAD | ABBA | SPECIES11=UK, TAG FOUND ON GROUND | Do not change |
| N326 | 14 | 985 | DEAD | DEAD | ABBA | SPECIES11=UK | Do not change |
| N326 | 14 | 986 | DEAD | DEAD | ABBA | SPECIES11=UK | Do not change |

* Other notes:W60, plot 20, 993473 has a NOTE11 of “30o to 35o” which indicate leaning, but COND11 was recorded as H. we changed COND11 to LN.

**HR/DIST:** General direction from the center using the hours on a clock face as reference

And distance from the plot center to an individual plant. It was recorded for all trees/sapling in East, West and South HH plots. Some are missing, some got updated in 2011. Data were newly collected for live trees in S344 plot 16~ 19 and some of the North transect plots. One plant from 1999 data have both DIST and HR equal to 0, and the HR was corrected to 12 in 2011, 15 other plants from 1999 or 2011 have only DIST equal to 0. We should keep the 0s.

**WTAZ/DIST:** Azimuth values and distance from the plot center to witness trees for regular elevation plots, and negative plots. Some new witness trees in 2011 miss AZ values.

**WITN:** 1=witness trees. Missing for the others.

**ELEVCL**: For high-high plot, ‘HH’ were given as elevation class, for negative plots, or plots has elevation less than 762 meters on South plots, ‘LL’ were give as elevation class. The rest plots on South plots, use the standard we have been using to give L, M, or H as elevation class: L: 762~914; M: 914~1066; H: 1067~1219; W32P16 has elevation of 1189m, and W70P16 has elevation of 1205m, but they both followed high-high protocol, so I still gave them ELEVCL of high-high.

**ASPCL**

**SOILOLD:** old soil class which has two categories: Histosol or Spodosol

**SOILCL:** new soil class which has three categories: Histosol, Spodosol, and Inceptosol. Details can be find in “Soil Data History 86~11”.

**CLASS:** T=transect

**CODE98A:**

**CODE98B**

**SLOPE87:** slope collected for regular transect plot in 1987 in percentage.

**SLOPE99:** slope collected for negative, high-high and some south plots in 1999 in percentage.

**SLOPE10\_D/SLOPE10\_P**

Slope re-measurement in 2010 in degrees or percentage for some of the transect plots were sampled before Comparing SLOPE10\_D with SLOPE10\_P, and SLOPE10\_D with SLOPE87 and DEM extracted slope in Jan.2013, set SLOPE10\_D for W46, PLOT-4, PLOT8, and W32, PLOT9 as missing because they were not consistent with the other data. In future data analysis, if a plot has 2010 data and data from previous years, we would trust data from 2010 more. Lixi 01/31/2013 (In SAS, to convert between degree and percentage, use this: SLOPE\_P=100\*TAN(PI\*SLOPE\_d/180)); SLOPE\_D=180\*ATAN(SLOPE\_P/100)/PI

**ASP**: Recorded for all plots except for E334 plot-3.

**ELEV**: elevation in meter for all plots.

**TRAD**: Plot radius where trees were tagged. For all negative and regular transect plots, it’s all equal to 5, for some high-high plots, it’s equal to 4. W46, plot 17, 18, and 20 had TRAD recorded as 5 in old SAS file from Kevin, which was an error, they should all be 4.

**TRAD11**: Recorded when plot radius got changed in 2011. There is actually no change in tree radius in 2011.

**ABSRAD:** Radius for areas where ABBA sapling were tagged. For all the other species, the sapling area is always 5cm because we never found more than 30 sapling in a area smaller than the 5cm radius. Sapling were only tagged in S26(?), plot 20~24 on S344, and East & West plots 16~.

**ABSRAD11:** Recorded when sapling area changed in 2011. New saplings will be tagged in new sapling area. S344, plot 20, SRAD changed from 4 to 3 due to fir wave.

**ELEV\_FT11/ELEV\_M11:** Some of the elevations were re-measured in 2011 in ft and m.

**ASP11:** Some aspect was re-measured in 2011 in degrees.

**MICR:** PLAN, CONC, or CONV

**PISAP87:** number of PIRU sapling count collected in 1987 for East, West, and North regular plots.

**HRB87:** Percentage of herb cover on the plot estimated in 87. Only collected for East, West, and North transect regular plots (plot 1~15) in 1987. Averages of at least 3 field readings were already taken. All herb?

**HRB1\_87/ HRB2\_87/ HRB3\_87:** Most, second and third abundant herb species. Number 1~18.

**SHRB1\_87/ SHRB2\_87/ SHRB3\_87:** Most, second and third abundant shrub species. 0~14.

# *2 Seedling Data*

*Live Seedling were tagged and measured in donut shaped area between 0.5m and 1m from the plot center in all High-High elevation transects plots (East & West Side plots with plot numbers larger than 15, and South Side plot S344, plot 20~24) in 1999,* *15 fir seedlings, 3 in each height size class were tagged. If a size class is not represented then select another size class randomly. Fir seedlings were counted by age and height class to. Other species were tagged following 1999 segment protocol, which means seedlings in all species are all tagged. (No 30 seedling rule?); all these plots were revisited in 2000 for survivorships except a few seedlings were missed; then these seedlings were re-measured in 2011, and new seedlings were tagged in 2011 too.*

## *2.1 Seedling Data collected in 1999*

***SAS data sets:***

[*R:\MOOSHUBB\longterm\Transects\Tran1999\Datasets\putseed.ssd*](../../Transects/Tran1999/Datasets/putseed.sas7bdat) *(This also included data from 2000)*

[*R:\MOOSHUBB\longterm\Transects\Tran1999\Datasets\tfrden99.ssd*](../../Transects/Tran1999/Datasets/tfrden99.sas7bdat) *(fir seedling count data)*

TRANID: Transect Azimuth in degrees.

PLOT: Transect plot numbers.

TAGNO: tag numbers.

SPECIES: species identifications. STAT99: HT99: Seedling height in cm. 0 values should be set as missing.

CII99: Crown illumination index, recorded for all live seedlings in 1999.

TERM99: Terminal leader. Some are missing.

DIST: Distance from the plot center

HOUR: general direction from the center using the hours on a clock face as reference

SUB: Substrate type. Some are missing.

ON: Substrates if they occur on deadwood

E99~E94: Extension growth from 1999 to 1994 for ABBA only. Some are missing.

DISTREM1: Distance remaining after all readable extension growth.

MINAGE: Seedling minimum age.

DISTREM2: distance remaining after reading minimum age.

EXTNOTES: notes for extension growth.

NOTES: other notes.

h0t10y~h75t100: Balsam fir seedlings were counted by age and height class in the donut shaped seedling area between 0.5 and 1.0m in each plot.

## *2.2 Seedling Data collected in 2000*

STAT2000: Status in 2000, recorded as “ALIVE”, “DEAD”, “NF” (not found), or “MD” (trees/sapling miss 2000 status data).

CII2000: Crown illumination index recorded in 2000.

## *2.3 Questions/Problems about Old Data*

* No seedlings were tagged in W70, plot 18, E320 plot 18, and W46 plot16, no seedlings found in 1999? New seedlings were tagged in these plots in 2011. They did look for them, comparing with seedling count data. (We don’t tag first year seedlings)

## *2.4 Seedling Data collected in 2011*

### 2.4.1 1Tagged Seeding Data:

*All tagged seedlings on East and West and S344 high-high transect plots were re-sampled. New seedlings were tagged.*

***About E335:*** *The same as tree/saplings data, E335 plot 15 was sampled by accident, Plot “17” and “18” sampled in early season were actually plot 15, and 16. (Data collected on Jun.17 and 20, and entered on Jun.24). Seedlings were tagged for the first time in plot 15 This already got corrected in both excel raw data and SAS data.*

***SAS data set:*** [*R:\MOOSHUBB\longterm\lixi kong\Transect2011\trseed11.ssd*](trseed11.sas7bdat)

TAGNO: Tag new seedlings until we have 15 fir seedlings for 3 in each size. For other species, also tag new seedlings. No new recruits for ABBA, but for other speices. Yes.

SPECIES: species identifications for new seedlings

STAT11: Status. A=alive; D=dead ; NF=not found assumed dead (tag & plant both not found).

HT11: Re-measure seedling height in cm

CII11: Crown illumination index

TERM11: Terminal leader. HE=apparently healthy, alive; ND=no dominant leader; NG=no growth this year through apparently alive; BR=browsed off; BK=broken off (mech damange); IN=clear insect damage; DE=dead or missing without clear cause; make notes if none of there applies.

DIST11: Check DIST from old data and make corrections if needed, and record DIST for new recruitments in mm.

HR11: Check HOUR from old data and make corrections if needed, and record HR for new recruitments.

SUB11/ON11: *SO=bare mineral soil; MO=moss; CL=conif litter; DL=decid litter; ML= mixed litter;* DW= dead wood >2cm; AW=aerial wood > 2cm; LS=live stem incl roots; DS=dead stem standing incl roots; ST=stump top (< 1m); RO= bare rock; WA= standing or running water; TP=tipup mound

E11~E06: Estimate extension growth from 2006 to 2011 in mm for seedlings in all species. Adjusted to cm in master file. Make notes as appropriate (eg. NL08=if a new leader become the apical dominant in 2008). NOT done for South transect plots.

DISTR1\_11: Distance remaining after all readable extension growth in mm. Adjusted to cm in master file. NOT done for South transect plots.

MINA11: Seedling minimum age. NOT done for South transect plots.

DISTR2\_11: distance remaining after reading minimum age in mm. Adjusted to cm in master file. NOT done for South transect plots.

NOTES11: Some notes are extra information made in 2011.

### 2.4.2 Seedling Count Data:

*Seedlings in all species, not distinguished by age were counted in three 1\*1 quadrats (L, R, and U) outside each plot in 2011. This was only done for West and East high-high Plots. Data are missing for the following plots: W32 plot18; W60, plot 19, 20; W70 plot 16~21; E334 plot 19, 20.*

***SAS data set:***[*R:\MOOSHUBB\longterm\lixi kong\Transect2011\trseedcnt11.ssd*](trseedcnt11.sas7bdat)

TRAN/PLOT

QUADRAT: L, U, or R.

SPECIES: All species were sampled. (Only ABBA, BECO, SOAM found in actual data collection)

SZCLASS: Height class: 0~10 (including both 1yr and older than 1yr), 10~25, 25~50, 50~75, and 75~100.

COUNT: Actual counts of seedlings in each quadrat. During data management, give 0 values to species which were not found.

Location of the 3 quadrats?

## *2.5 Tagged Seedling master file 1999~2011*

SAS program: R:\MOOSHUBB\longterm\lixi kong\Transect2011\TRSEEDMAS11.sas

SAS data set: [*R:\MOOSHUBB\longterm\lixi kong\Transect2011\trseedmas11.ssd*](trseedmas11.sas7bdat)

**TRAN**

**TPLOT**

**TAG**

**SPEC:** 2 seedlings had SPEC as **UK**. They were tagged in 1999, but not included in the data set, field crew found them in 2011 dead.

**YRTAG**

**YRREC**

**STAT99:** status for 1999 tagged seedlings. All “ALIVE” in 1999 except for the 2 UK seedlings mentioned above.

**STAT00:** ALIVE, DEAD, or NF.

**STAT11**

**YRMORT**

**HT99: 4 seedlings** that were alive in 1999 miss HT99, they are NF or DEAD in 2011.

HT99 was crosschecked with Stem length, which is the sum of EXs plus MINAGE, there are some plants have HT99 greater than stem length, and we decided to leave them

Original data were collected with one decimal, but somehow data were only entered as integers, this could be the reason why HT99 is greater than stem length, but there is only a few hand written hard copies, so we decided to leave as what it is now. We should be careful when we correct 0 values. Lixi 6/10/2013.

**4 live seedlings** miss HT99, and they were DEAD or NF in 2011. If they had EX distrem ,can estimate height.

**TERM99:** Terminal leader condition estimated in 1999. It was cross checked with PEX99, and relevant corrections were made. It’s missing for **11** seedlings that were alive in 1999.

* BK: Broken. EX99 should be missing, and all other EXs not reliable for year. EXs are all missing. No correction needed.
* BRS: browsed off. EX99 should be missing. All other EXs not reliable for year. EXs are all missing. No correction needed.
* DE: dead top. EX99 should be missing. One plant has PEX99=0 correct it. Trust the rest EXs.
* FOLIAGE: “foliage die back” found on hand written hard copy.
* HE: no correction needed.
* ND: no dominant leader. EX99 should be missing. All EXs not reliable for year. One plant has PEX99=0, corrected it to missing and add variable YRREX
* NG: no growth. retain 0s, no correction needed

**PEX99, EX98-EX94:** As many as 6 year EXs growth were measured for ABBA seedlings tagged in 1999. Some are missing.

Plants with EXs equal to 0 were double checked with available hand written hard copies: One plant has a dead top, set PEX99 from 0 to missing.

Found by chance: E334, PLOT 18, 252 and 238 have a note of “did not enter E”, and EXs, DRM, MINAGE were not entered. Data entered by Lixi. Lixi 6/10/2013

For other EXs equal to 0, we can set them to 0.5 for analysis. Check how many are there

**YRREX:** The earliest year of reliable extension growth measurement for 1999 and 2011 tagged seedlings. For plants that were measured for EX in both 1999 and 2011, this is based on 2011 measurements.

**MINAGE99:** minimal age for 1999 tagged ABBA seedlings. For all seedlings had EXs measured, NO MINAGE99 is missing, or equal to 0/1.

Plants with MINAGE99 <=EXCNT were double checked:

* MINAGE99=EXCNT: D1RM98 should be equal to D2RM98. If not equal, leave D2RM98 as missing.
* MINAGE99 < EXCNT: make MINAGE99 missing

**D1RM99**

**D2RM99**

Plants with D1RM99 or/and D2RM99 missing or equal to 0 or D1RM99 <= D2RM99 were double checked:

* D1RM99=D2RM99=0: Since there is only as many as 6 year EXs measured, if there are less than 6 year EXs measured, MINAGE should be equal to count of EXs; if there are 6 year EXs measured, MINAGE should be larger or equal to 6. Make MINAGE99 missing if not consistant.
* D1RM99 > 0 and D2RM99=0: In this case, MINAGE should be larger than count of EXs. All correct.
* D1RM99 >0 and D2RM99 missing: leave it
* D1RM99 < D2RM99: only one case. Set both missing.
* D1RM99 >0 and D2RM99>0 and D1RM99=D2RM99 MINAGE should be equal to count of EXs. If not equal, set MINAGE as missing

Original data were collected with one decimal, but somehow data were only entered as integers, this could be the reason for some 0s. However, there is only a few hand written hard copies, so we decided leave it as what it is for now. Lixi 6/10/2013

**EXTNOTES99:** Year in which a new leader came out. EXs before the first year of new leader are not reliable for year.

**NOTES99:** Notes made in 1999. Some data got truncated.

* 1 LAT LIVE
* CANT DO E
* L-SHAPED STE/ STEM IS L-SH
* SPARES NEEDL
* TAG IS MADE

***\* EX, MINAGE, D1RM/D2RM, HT, NOTES checking file:*** *R:\MOOSHUBB\longterm\lixi kong\Transect2011\EXHT\HHTR99tagged.xls*

**CII99:** crown illumination index collected for all1999 tagged live seedlings.

**SUB99/SUBON99:**

* LITC:
* LITC on WDG5:
* LITM:it was originally recorded just as “LITTER”, assume it’s mixed litter
* MSS
* MSS on BLA5
* MSS on WDG5
* WDG5
* WOOD on DEAD WOOD:was corrected to WDG5. If DBH is less than 5cm, it would be identified as litter.
* **1.5:** set as missng

**CII00:** crown illumination index collected for live seedlings in 2000.

**HT11:** height collected for live seedlings in 2011. **7 seedlings** that were tagged in 1999 and still alive in 2011 miss HT11.

***Check on HT growth 1999~2011: maximum HT growth is 67 cm, minimal is -10. No correction needed.***

**NOTES11:** Notes recorded in 2011. For some of the notes, standardized notes were added followed by an ‘;’ and the original notes, and some were just retained as what they were originally. More Details can be found in “R:\MOOSHUBB\longterm\lixi kong\Correction&Fieldcheck\Trans Notes&Correction 2011/xls” (“seeding” worksheet)

Standardized codes used include:

* NL/NL ##: new leader (in certain year). If a year was recorded, this was used to decide till which year EX was reliable.
* RL: relabeled. Seedlings retagged in 2011; or tag numbers recorded wrong in old data; or found a seedling without a tag, but matching other data, it should be certain old seedling.
* TC: tag correction. Tag number recorded wrong in old data.
* SAP: seedlings grow into saplings in 2011. Seedling data were NOT collected. Sapling data were collected instead.
* PTG: previously tagged, but were missing in the data set before.
* NR: new recruit. ‘
* NR appear older than last census’? too old to be a NR in 2011

**TERM11:** Terminal leader condition collected in 2011 for some 1999 tagged and 2011 tagged plants. TERM11 was cross checked with PEX11:

* BK: Broken. PEX11 should be missing. All other EXs not reliable for year. Corrected for 0s. What if PEX11 GT 0? It’s possible.
* BRS: browsed off. EX99 should be missing. All other EXs not reliable for year. No EX were recorded for plants with TERM11=BRS. No corrections needed.
* DE: dead top. PEX11 should be missing, trust the EXs. Corrected 0 values to missing. “terminal bud discolored” What if PEX11 gt 0? The current top is not dead, pervious top is dead.
* HE: healthy. Some were recorded as ‘A’ (alive), and was set as HE also.
* ND: no dominant leader. All EXs not reliable for year. PEX11 > 0? Trust the data
* NG: no growth. Retained the 0 values.What if PEX11 > 0? Set it as 0. Only 1 plant.

**PEX11, EX10-EX06:** Extension growth collected for 2011 and some 1999 tagged plants (mostly ABBA) tagged plants in all species in mm. Plants with EX equal to 0 were double checked (there is only one case which is PEX11=0), and we decided to trust the data.

**D1RM11:** in mm

**D2RM11:** in mm

* D1RM11=D2RM11=0: When D1RM11=0, MINAGE should be equal to count of EXs (data all equal), and MINAGE should be the actual AGE. Set both as missing. **Should we trust all the 0 values since we trust the data entry in 2011? Yes, trust the 0s.**
* D1RM11=0 and D2RM11>0: D1RM11 should not be less than D2RM11. Consistent with hard copy, set D1RM11 as missing.
* D1RM11>0 and D2RM11>0 and D1RM11 < D2RM11: only one case, which is a layered individual, which has a NOTE11. Might want to make a special note so we can exclude it from certain analysis.
* D1RM11>0 and D2RM11>0 and D1RM11=D2RM11: MINAGE should be equal to count of EXs. If not equal, make MINAGE missing.
* D1RM11 > 0 and D2RM11=0: In this case, MINAGE should be larger than count of EXs. If not**,** make MINAGE as missing

Usually when D2RM<1, we can take MINAGE as AGE, except one case

**MINAGE11**

* MINAGE11=1:set as missing
* MINAGE11=EXCNT11: D1RM11 should be equal to D2RM11. If not equal, leave D2RM98 as missing.

***\* EX, MINAGE, D1RM/D2RM, HT, NOTES checking file:*** *R:\MOOSHUBB\longterm\lixi kong\Transect2011\EXHT\HHTR11tagged.xls*

**CII11:** crown illumination index collected for live seedlings in 2011.

**SUB11/SUBON11:** early season defined WDG as dead wood on the ground >5cm and >2cm in late season; WDA was “**up 10**” (assumed >5cm) in early season and >2cm in late season. Also for some plots, seedling data were NOT collected in the same day as plot quadrat substrate data, which was marked bold in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **TRANS** | **TPLOT** | **FIELD SEASON for tagged seedling** | **FIELD SEASON for quadrat substrate** |
| E320 | 16~20 | late | Late |
| E330 | 16~19 | late | Late |
| **E334** | **16~20** | **late** | **16~18:late; 19~20:early** |
| E335 | 15, 16 | early | Early |
| 17,18 | late | Late |
| W32 | 16~19 | late | Late |
| W46 | 16~20 | late | Late |
| W60 | 16~18 | Late | Late |
| 19,20 | early | early |
| **W70** | **16~19** | **late** | **16, 17: late; 18~21: early** |
| **20,21** | **Early(Data was on E335 data sheet )** |  |
| S344 | 21~24 | late | NA |

* **BSOIL**
* **LITM**
* **LITD**
* **LITC**
* **LITC on BLA5**
* **LITC on RCK**
* **LITC on STP**
* **LITC on WDG2**
* **MSS**
* **MSS on BLA5**
* **MSS on RCK**
* **MSS on STP**
* **MSS on WDA10**
* **MSS on WDG2**
* **WDG5/WDG2**

**E334 plot 18, tag 252, SUBON11=9, but on hard copies, SUBON11 is missing, and EX11=9, all EX were shifted to the left by one year, should correct both SUBON and EXs.**

**HR**

**DIST**

**CLASS**

**ELEVCL**

**ASPCL**

**ASP**

**ELEV**

**SLOPE87:**only for E335, PLOT 15, which we thought was 17 and missampled for seedlings

**MICR:** only for E335, PLOT15.

**SLOPE99**

**ASP11**

**ELEV\_FT11**

**ELEV\_M11**

## *2.6 Seedling count master file 1999~2011*

SAS data set: [*R:\MOOSHUBB\longterm\lixi kong\Transect2011\trseedcntmas11.ssd*](trseedcntmas11.sas7bdat)

**TRAN**

**PLOT**

**AREA**

**QPOS**

**SPEC**

**HTCL:** 0-10; 10-25; 25-50; 50-75; 75-100

**AGE:** 1YR, >1YR(besides 0-10old recorded, assume all seedlings with HTCLASS larger than 0-10 are older than one year), or ALL(when 1yrs and older ones for 0-10 HTCL were not distinguished)

**CNT**

**CENS**

# *3. Substrate Data*

## *3.1 Data collected in 1999*

*In each of the high-high transect plot on East, West, and South side, one 1\*1 quadrat was sampled for substrate data in 1999, following 1998 protocol with 1999 amendments*

*E335 PLOT 16 has two sets of records.*

***SAS data set:***[*R:\MOOSHUBB\longterm\Transects\Tran1999\Datasets\tsub99.ssd*](../../Transects/Tran1999/Datasets/tsub99.sas7bdat)

ROCK: Percent cover of rocks

H2O: Percent cover of water

BSOIL: Percent cover of bare soil

GWOOD: Percent cover of wood debris\_ground>5cm

AWOOD: Percent cover of wood debris\_aerial>5cm (includeing substrate growing on it?)

BOLEA: Percent cover of live standing-stem

BOLED: Percent cover of dead standing-stem

TIPUP: Percent cover of tipup mound

STMP: Percent cover of stumps

MOSS: Percent cover of moss

LITTER: Percent cover of litter (total) = MIXEDLIT+CONLIT+DECLIT

MIXEDLIT: percent cover of mixed litter

CONLIT: Percent cover of conifer litter

DECLIT: Percent cover of deciduous litter.

LAIRWOOD: Percent cover of litter on aerial wood.>5cm

AMOSS: Percent cover of Aerial moss >5cm

## *3.2 Data collected in 2011*

*Substrate data were collected in three 1\*1 quadrat in each of the East and West high-high transect plots in 2011. Data is missing for W32 plot18.*

*The same as tree/sapling and seedling data, E335 plot 15 was sampled by chance. Substrate data were collected which we never did in transect regular plots.*

***SAS Data set:*** [*R:\MOOSHUBB\longterm\lixi kong\Transect2011\trsub11.ssd*](trsub11.sas7bdat)

TRAN/PLOT

QUADRAT: In early data collection, this was recorded as 1, 2, 3 to just differentiate them rather than identify specifically. After that, quadrat was recorded as “L”, “U”, or “R”. For observer facing uphill, U=upslope; R=right; L=left.

Substrate Cover data:

* *This got changed in mid of the season. Early in the season, Plot 19, 20 on E334; Plot 15, 16 on E335; Plot 19, 20 on W60; and Plot 18, 19, 20, 21 on W70 used substrate types as follows:*

WATER: not found for early season

BSOIL: not found for neither early season nor late season

RCK:

BLA5:

BLD5:

TIPA:

STPA:

LITC:

LITM:

LITD: not found for neither early or later seaon.

LIWDA5: Early in the season, this is litter on aerial wood>5cm; later in the season, this is litter on aerial wood>2cm, but it was not found.

WDA5/WDA2: In early season, this is aerial wood >5cm (excluding substrate growing on it). Later in field season, this is aerial wood>2cm.

WDG5/WDG2: In early season, this is dead wood on the ground>5cm. Later in field season, this is dead wood on the ground>2cm.

MSSG: moss on the ground. This doesn’t include Moss on other substarte on the ground.

MSWDA5/MSWDA2: In early season, this is moss on aerial wood>5cm, and no other kind of MOSS on \*\* were recorded. Later in field season, this is moss on aerial wood>2cm.

***Later in field season, more substrate growing on another substrate was recorded for the rest of plots:***

MO\_LS: Moss on live bole

MO\_DS: Moss on standing dead bole

MO\_DW: Moss on dead wood on the ground>2cm

MO\_AW: Moss on aerial wood>2cm. This is always less than WDA2, except one obs (probably an error. Can check hard copy. If consistant, correct WDA the same as MSWDA.. So WDA2 includes MO\_AW)

MO\_ST: Moss on stump with top<1m

MO\_RO: Moss on rock

MO\_TP: Moss on tipup

DW\_ST: Dead wood on stump

## *3.3 Substrate master file 1999~2011*

SAS program: R:\MOOSHUBB\longterm\lixi kong\Transect2011\trsubmas11.sas

SAS data set: *R:\MOOSHUBB\longterm\lixi kong\Transect2011\trsubmas11.ssd*

**SAS data set: *R:\MOOSHUBB\longterm\lixi kong\Transect2011\trsubmas11c.ssd (corrected for SUMG for 2011 data)***

TRAN

TPLOT

QPOS

CENS

FIELD: early (early season); late (late season).

RCK

BSOIL

WATER

WDG5

WDG2

WDA5

WDA2

MSWDA5

MSWDA2

In 1999, 8 quadrats have MSWDA >WDA

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TR | PL | CENS | RCK | SOIL | WAT | BLA | BLD | TIP | STP | LITT | MSSG | WDG5 | **WDA5** | **MSWDA5** | LTWDA5 | SUMG | SUMA |
| E320 | 18 | 1999 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 83 | 15 | 0 | **0** | **2** | 0 | 100 | 100 |
| E320 | 19 | 1999 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 95 | 0 | **0** | **10** | 0 | 100 | 100 |
| E330 | 18 | 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 90 | 0 | **0** | **0.5** | 3 | 100 | 103 |
| S344 | 21 | 1999 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 7 | 90 | 1 | **0** | **0.5** | 0 | 100 | 100 |
| W60 | 19 | 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 53 | 35 | 10 | **0.5** | **2** | 0 | 100 | 100.5 |
| W70 | 17 | 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 80 | 0 | **0** | **2** | 2 | 100 | 102 |
| E335 | 16 | 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0.5 | 60 | 40 | 0 | **0** | **0.5** | 0 | 100.5 | 100.5 |
| S344 | 24 | 1999 | 0 | 0.5 | 0 | 2 | 0 | 0 | 0 | 16 | 80 | 2 | **2** | **4** | 0 | 100.5 | 102.5 |

LTWDA5

BLA5

BLD5

TIPA

STPA

LITT: litter collected in 1999. In 2011, this is equal to LITM+LITD+LITC

LITM

LITD

LITC

MSSG: For 2011 late season, this doesn’t include MSBLA5, MSBLD5, MSWDG2, MSSTP, MSRCK and MSTIP, this got corrected.

MSBLA5: % cover of moss on standing bole live collected in 2011 later season only.

MSWDG2: % cover of moss on dead wood on the ground collected in 2011 later season only.

MSSTP: % cover of moss on stumps collected in 2011 later season only

MSBLD5: % cover of moss on standing dead collected in 2011 later season only

MSRCK: % cover of moss on rock collected in 2011 later season only

MSTIP: % cover of moss on tipups collected in 2011 later season only.

WDSTP: % cover of dead wood on stumps collected in 2011 later season only.

SUMG: sum of everything on the ground before correction.

* 1999: SUMG=RCK+WATER+BSOIL+WDG5+TIPA+STPA+MSSG+LITC+LITD+LITM+BLA5+BLD5. It varies between 100 and 100.5, no correction needed.
* 2011 early season: SUMG= RCK+WATER+BSOIL+WDG5+TIPA+STPA+MSSG+LITC+LITD+LITM+BLA5+BLD5. It varies between 89 and 102. For values not equal to 100, LITC (no LITD or LITM were recorded for early season) and LITT were adjusted to make SUMG equal to 100.
* 2011 late season: SUMG= RCK+WATER+BSOIL +WDG2+ TIPA+STPA+MSSG+LITC+LITD+LITM+BLA5+BLD5 +WDSTP. This varies between 73 and 139. Forsmall SUMG, looks like WDA/MSWDA was treated as on the ground when field crew adjusted litter, so LITM(and LITT) was corrected. For big SUMG, there is duplication between “one substrate on another” and “one substrate”. For example, MSBLA5 overlaps with MSSG or BLA5. MSBLA5 was subtracted from BLA5, and if BLA5 < MSBLA5, BLA5 was subtracted from MSSG. 3 Observations which couldn’t be made sense of were excluded from the corrected data set.
* SUMA: sum of everything including aerial substrates before correction.
* 1999: SUMA=SUMG+WDA5+LTWDA5
* 2011 early season: SUMA=SUMG+WDA10+MSWDA10+LTWDA10
* 2011 late season: SUMA=SUMG+WDA2+MSWDA2

SUMGC: sum of everything on the ground after correction only for plots where we made corrections. This varies between 99.5 and 100.5.

CORRECT:

* 1: LITM or LITT was corrected so SUMG is equal to 100.
* 2: In 1999, WDA5 was corrected to WDA5+MSWDA5 when WDA5 < MSWDA5

# *4 Species Cover Data*

## *4.1Data collected in 1999*

*Data in hardcopies were not entered before. Entered by Noah/Lixi in Jan. 2012: R:\MOOSHUBB\longterm\lixi kong\Transect2011\spcov99.xls*

*One quadrat in each transect plot(David is pretty sure the quadrat is in the plot center) was sampled for species cover within the 1\*1\*1 cube. Among all high-high transect plots, no data for E320 P20, W60 P17~20, w70 P19~21; E335 P16 has two sets of data, and an average was taken. (also has two sets of data for substrate)*

## *4.2 Data collected in 2011*

*Species cover data were collected in three 1\*1 quadrats in each of East and West high-high transect plots (outside the plots).*

*The same as tree/sapling, seedling, and substrate data,* ***E335 plot 15*** *was sampled by chance. Species cover data were collected which we never did in transect regular plots.*

***SAS Data Set:*** [*R:\MOOSHUBB\longterm\lixi kong\Transect2011\trspcover11.ssd*](trspcov11.sas7bdat)

TRAN/PLOT

QUAD: In early data collection, this was recorded as 1, 2, 3 to just differentiate them rather than identify specifically. After that, quadrat was recorded as “L”, “U”, or “R”.

For observer facing uphill, U=upslope; R=right; L=left.

SPECIES: Species abbreviations.

PCTCOV: Percentage of cover. For each quadrat, a complete list of species found in 2011 was added, and percentage of cover for those we didn’t find was set as 0.

## *4.3 Species Cover Master file 1999~2011*

SAS program: R:\MOOSHUBB\longterm\lixi kong\Transect2011\trspcovmas11.sas

SAS data set: R:\MOOSHUBB\longterm\lixi kong\Transect2011\trspcovmas11.ssd

**TRAN**

**TPLOT**

**PCVQ:** position of species covers quadart

**SPEC**

**PCVR: For both 1999 and 2011 data, if a coverage was not recorded for a species, a row with PCVR of 0 was added so we don’t overestimate average in later analyisis.**

**AREA:** since all were sampled in 1\*1m quadrat, so AREA=1 for all.

**CENS**

Different species we had cover data in two years are listed as follows:

|  |  |  |
| --- | --- | --- |
| 1999 | 2011 | SPTYPE |
| ABBA | ABBA | TREE |
|  | ARNU | HERB |
| ASAC | ASAC | HERB |
|  | ASSPP | HERB |
| BECO | BECO | TREE |
|  | CASPP | HERB |
| CLBO | CLBO | HERB |
| COCA | COCA | HERB |
| COGR | COGR | HERB |
| DRSP | DRSP | HERB |
|  | DRSPP | HERB |
| LYLU |  | HREB |
| MACA | MACA | HERB |
| OXMO | OXMO | HERB |
|  | RISPP |  |
| SOAM | SOAM | TREE |
| SOMA |  | HERB |
|  | STSPP | HERB (we have STAM on the species list |
| TRBO | TRBO | HERB |
|  | UKFE | HERB |
|  | UKSPP |  |

# *5 Witness Tree Data 1999*

[*R:\MOOSHUBB\longterm\Transects\Tran1999\rawdata\_1999\ Witness trees ext trans*](../../Transects/Tran1999/rawdata_1999/Witness%20trees%20ext%20trans.xls)

*Updated witness tree data were included in transect tree/sapling master file 1987~2011*

# *6 Destructive Data 1999*

One destructive plot paired with one high-high transect plot was sampled in 1999.

Establish a reference point 15 m from the plot center along the contour on the left side of the transects as you travel up slope. If the transect is running with the contour than establish the sample point to the left, perpendicular to and 15 m from the transect line. At the 15 m point measure 2 m in a randomly chosen cardinal direction to set the sampling point.

In the following size classes select one individuals nearest to the sampling point established.

|  |  |
| --- | --- |
| Destructive Sample Size Classes | Sampling Method |
| 0 - 25 cm | Shear (disk) |
| 26 - 50 cm | shear |
| 51 - 75 cm | shear |
| 76 - 150 cm | Cut (disk) |
| 151 - 300 cm | cut |
| > 3.0 cm < 5.0 cm dbh | core |
| ≥ 5.0 cm dbh | core |

Disks and cores were both taken at the base of the plant. Do not take disks within 5 m of the transect plot. Another individual in another size class was not randomly selected if an individual in a given size class was not found.

For many samples, only one core was taken (parallel to the contour). Eventually, the crew began collecting two cores for the sample tree. One along the contour (marked '=') and one perpendicular (marked 'T') to the contour (either upslope or downslope; also marked on the core board).

Disks taken were given a unique number as the key identifier in the database. Cores were glued to a core board, each receiving a unique number as well. A photograph was taken of each sample with a digital camera mounted on a light microscope, and were analyzed using WinDENDRO. Absolute ages were determined for the disk samples by counting all rings from pith to bark, while minimum ages were determined for the cores by counting all rings from the point nearest the pith to the bark. Ring widths were obtained by using WinDENDRO to calculate the distance between each marked tree ring.

On each individual cut down or cored, field data were also collected: species, height, dbh, diameter at 10 cm (dah) and substrate in which it grows (seedlings). Assess condition of terminal and if possible measure extension growth for 97, 98, and 99. Crown Illumination Index (Clark and Clark, 1992) was assessed starting 8/3/99.

Core/Disk scan copies on CDs were transported to AFS data base on 04Feb2013 by Lixi.

* **Fir**: 175 individuals had disk data that were analyzed by WinDENDRO and 75(77, 2 were not included in Dora’s analysis) individuals had Core data analyzed (1~2 cores were taken for each plant, so there were 130 obervations).

Field data has 219 plants with disk IDs, and 75 plants with core IDs. All core data was able to match; for disk data, all plants that had WinDENDRO data have field data, but 44 plants that had field data don’t have WinDENDRO data, of which each transect has a few.

* **Birch:**

Possible done data file:

CD1\Data files\BirchCoresTangent.txt (68 observations for 44 individuals)

CD1\Data files\BirchDisks.txt (8 individuals)

Field data had 57 individuals with core numbers, and 110 individuals with disk numbers.

1 plant had WinDENDRO core data didn’t have field data, and 14 plants had field data but no WinDENDRO core data, but found all corresponding photo scan copies (Dori Ryan CD4 26Feb2002\todobirchcores)

All 8 plant had WinDENDRO disk data had field data, but 102 plant that had field data didn’t have WinDENDRO disk data. 42 photo scan copies were found here: Dori Ryan CD2 20Feb2002\DoryRyan\To Do\Disks\Birch

S344, disk 223, and E330 disk 257 diameter growths extremely high? Unit error?

* **Spruce**

Field data has1individual with Disk ID (194**);** and 4individuals with core IDs: core37.3, core18.1, core32.1, core72.1

No relevant data files. Corresponding scan photos all found on CD2.

* **Mountain Ash**

Field data has 3 individuals with core IDs: core 10.1; core21.2; core44.1 and19 individuals with disk IDs.

No relevant data files. Core photos for 3 individuals are on CD2; 8 disk photos were found on CD2

*All scan copies of core/disk and documents copied from CDs:*

R:\MOOSHUBB\longterm\TRAN Destructive Data

SAS programs for fir:

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\Fir.sas

*WinDENDRO SAS data sets for Fir:*

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\fircore.ssd

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\fircoreave.ssd (average of ring count and ring width (for each year) was taken when two cores were taken for the same plant).

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\firdisk.ssd

*Filed data*:

*R:\MOOSHUBB\longterm\Transects\Tran1999\Datasets\tdisk99.ssd*

***Fir Master data set*** *including both WinDENDRO and field data:*

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\firmash (data set has a horizontal structure for ring width)

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\firmasv(data set has a vertical structure for ring width)

TRANID

PLOT

DISK: disk number for smaller plants

TRAKCORE: For bigger plants with DBH >=3cm

SPECIES

CII

DAH1/DAH2

DBH1/DBH2: Core16.1: DBH1=14.1, DBH2=0. DBH2 was set as missing.

HT99

SUB/ON: substrate type seedlings grow on

TERM99

E99~E97

NOTES

RCNT: total ring counts. For plants which two cores were taken, this is an average of two.

AGECL: age class Dora used in the paper. We can probably drop this.

RW1998-RW1892: For horizontal structured data set, this is ring width for each year of 1998 to 1892 in mm?. For core data, this is average of two values if two cores were taken for the same plant and two ring widths were read for the same year. For fir, DISK116 (yr 1971 and 1993), DISK183 (yr1988), DISK209 (yr1981), and DISK348(yr1969), RWIDTH was missing. Set RWIDTH as the average of the three previous year and later years for now.

YR: Year. For vertical structured data set only.

RWIDTH: For vertical structured data set, this is ring width for each YR. For core, this is an average of two sometimes.

AGE: For vertical data set, this is the age of each plant corresponding to YR. Age starts with 1 at the earliest year with ring width.

SAS program for birch:

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\Birch.sas

Data sets for birch:

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\birchcore.ssd

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\birchcoreave.ssd

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\birchdisk.ssd

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\birchmash.ssd

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\birchmasv.ssd

# *7Destructive Plots Canopy Height Data 2000*

An attempt to characterize the height of canopy in the destructive area at each plot was done in 2000. A technician visited destructive plots sampled in 1999(paired with high-high transect plots) on East, West, and South side and estimated the height of the tallest 5 trees in that area.

[*R:\MOOSHUBB\longterm\Transects\Tran1999\Datasets\canopycl.ssd*](../../Transects/Tran1999/Datasets/canopycl.sas7bdat)

TRANID

PLOT

TREE: 1~5 corresponding to the 5 tallest trees in the plot.

HTCLASS: Height class in meters. 1-1.5, 1.5-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, and 10-11.

Midpoints of HTCLASS were taken, and then the average of the five tallest tree heights was taken to represent canopy height.

SAS program:

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\CHT00.sas

SAS data set:

R:\MOOSHUBB\longterm\lixi kong\TR Destructive Data\cht00.ssd

# *8 GLI Data collected in 2000*

GLI photos were taken at all East and West high-high transect plots. Each plot has 2~4 photos taken following the protocol below:

* One photo was taken at each plot center at the height of 75 cm. Foliage and branches were not manipulated (moved) at any plot center except if some object had potential to scratch the camera lens.
* One photo was taken over one tagged balsam fir (ABBA) seedling that was between 50-100cm tall in the sample area. Due to the size class distribution in high elevation forests on Mt. Moosilauke and the small area sampled for seedlings, there are not many tagged individuals that fall into this distinct category, thus photos of this type were not taken at each plot.
* The two closest ABBA saplings to the plot center that were between 100-150 cm tall also received GLI photos. Occasionally certain individuals were rejected. Instances that warranted rejected were impossible tripod set-ups. Often there were no suitable individuals at a given plot, and no photos of this type were taken.
* According to actual field data, tran320, plot 18, 19 and w32 plot 16 only had photos taken at the center of plot.

The camera was leveled and the top of the camera was aligned with North using a compass. The camera was focused to infinity and the f-stop was set to 8 (unless high light levels forced us to make a change). Light levels were determined using a light meter, and the shutter speed of each picture was set accordingly. Two pictures were taken at each photo location. On the first, the exposure time was set one setting faster than that which the light meter determined was accurate. The shutter speed for the second photograph was two settings faster than that of the first picture (or three settings above what the meter actually suggested).

For ABBA seedling/sapling where we took GLI photos, tree height, extension growth for 2000, 1999, 1998, crown illumination index, and camera height were recorded. The camera lens was positioned to be at the apex of the terminal leader. Thus the tree was moved enough to position the camera lens in the spatial location of the leader to most accurately capture the leaders light environment.

* *All original GLI photos (including segments):* Wainberg GLI work 13Feb2002\wainberg GLI-image (Transect: Roll 9~17)
* GLA scanning protocol: Wainberg GLI work 13Feb2002\GLA\_scanningportocol.doc. This file might contain items link to external server, it took a while to open it, but the file was empty. Maybe we can try opening it in older version of Word.
* *GLA processed bitmaps and calculation reports(on sky region basis) and copies of original GLI photos (Not all GLI were analyzed):*

Roll 3, 9~14: GLI image data2 27Oct2001

Roll 15~21: GLI image data3 27Oct2001

* GLA calculation reports(summary): GLI image data1 27Oct2001\calibration\_databases\_spreadsheets\gli.db.mdb

This access file was converted to excel file by Lixi in 2013:

R:\MOOSHUBB\longterm\lixi kong\TrSegGLI\gla\_db.xls

This file has multiple data sheets. Details see the table below

|  |  |  |  |
| --- | --- | --- | --- |
| worksheet | created | Last modified | content |
| Gla | 10/09/2001 | 10/09/2001 | Main results. **164** obs. |
| Image processing log | 7/09/2001 | 10/27/2001 | Frame adjustments. Roll 4 doesn’t have actual roll |
| Summary data gla calibration | 6/05/2001 | 8/20/2001 | Looks like sensitive test |
| Summary data gla effect | 8/20/2001 | 10/09/2001 | Looks like sensitive test |
| Summary data gla effect 30mintr | 8/20/2001 | 8/20/2001 | Looks like sensitive test |

Frame number from field data should be perceived frame numbers, assuming frame number from “Imagename” in gla worksheet is perceived frame number too, after merging, 76 out of the 94 point from matched; 18 plant/locations didn’t have GLA results to be matched.;

If assuming frames from gla were actual frame numbers, after merging, 91 out of the 94 matched.

Total number of segment and transect point/plant from field data is: 94+81=**175**.

* Plot and seedling/sapling data: [*R:\MOOSHUBB\longterm\Transects\Tran1999\Datasets\trangli00.ssd*](../../Transects/Tran1999/Datasets/trangli00.sas7bdat)

TRANID

PLOT

ROLL: roll number

FFRAME: first frame.

LFRAME: last frame. If the different between FFRAME and LFRAME is larger than 1, it means more than two photos were taken for the same plant/location.

CAMERAHT: cameral height

TAGNO: Tag number of ABBA seedling or sapling where GLI photos were taken. if it’s 0, then the GLI photo was taken at the center of the plot

HT2000:

CII2000:

E2000~E1998:

# *9Trap Data collected in 2000*

According to “Moosilauke Summary 2000”, over 60 traps were placed at the high elevation transect areas, but the SAS data set only has 40 traps? Hard copies seem to have only 40 traps at transects too? Two diameters were recorded for each trap when placed.

[*R:\MOOSHUBB\longterm\Transects\Tran1999\Datasets\trantrap.ssd*](../../Transects/Tran1999/Datasets/trantrap.sas7bdat)

TRANID

PLOT

TRAPID

POSITION

DIAM1/DIAM2

HEIGHT

DATE

Did we identify seeds?