



FINAL REPORT

To: Smithsonian Institution - National Museum of the
American Indian

For the Project: Forest Stocks and Fluxes Across a Management Gradient in
Northern Wisconsin

PROJECT OVERVIEW

The scope of this project was a component of a larger project funded primarily through USDA – NIFA Tribal Research Grant Program titled “Measuring the Pulse of the Forest”. The larger project included 4 core outcomes; 1) establish 3 – one hectare plots (1-training plot on or near the College of Menominee Nation Keshena campus, and 2 long-term forest monitoring plots in the Menominee forest) using the Richard Condit tree census protocol, 2) develop methods for assessing and monitoring cultural relationships, 3) deliver student research experiences, 4) engage tribal stakeholders. The NIFA funding for this project was awarded in September of 2012 under a 3-year grant. The SI, through the NMAI, provided a letter of support, and later supplemental funding through a P.O. to assist CMN/SDI with the plot installation and tree census portion of the project. The funding provided by SI-NMAI was used primarily to support outcomes 1 & 3.

Within the context of the outcomes described, the project essentially has two primary components; 1) Forest Based Ecological Data Collection, 2) Cultural Assessment of the Forest Resource Related to Climate Change. The other 2 outcomes are embedded within the framework of these two elements. Chris Caldwell (Director, SDI) has been the Principle Investigator of the Cultural piece of this project, working in conjunction with Michigan St. University and other project partners to build capacity in this context. Dean Fellman (Director, Center for First Americans Forestlands) has been working with the Smithsonian Institute (primarily Sean McMahon) and other partners to build research capacity in data collection. Since the SI funding was offered primarily to support the data collection component of the project, this report will be dedicated to describing the approach we have taken to fulfill that obligation, and our progress in that direction.

PROJECT HISTORY & STATUS

The data collection portion of this project essentially began in late May 2013 with the retention of 3 student interns who attended a re-census of the of the Wabikon SI GEO plot near Crandon, WI being conducted by Bob Howe and Amy Wolfe of the University of Wisconsin Green Bay. The group (including Dean Fellman) participated in the initial orientation and during 3 days of the re-census to learn the Condit protocol.

A section of wooded land on the NE side of the CMN campus had previously been identified as the optimal site to install the training plot. Upon returning from the Wabikon re-census, Dean Fellman and Joel Kroenke (CMN Campus Planner) located the survey monuments on the North and East sides of the plot, and taught the students how to run the perimeter lines using the monuments, tape measures, a compass, and line-of-sight. Once the perimeter lines were established (and verified) the students were taught how to use transect rule tapes to locate quadrat corners. Using this method, the students established the corners and conducted the initial census on the first 12 quads of the plot, starting on the North line and working in columns to the middle of the plot. Sean McMahon visited the site during this activity to observe the process and offer his input. This concluded the census work completed in 2013.

Also in 2013, Sean, Dean, and several employees from Menominee Tribal Enterprises identified candidate sites in the northern part of the Menominee Forest and did site reconnaissance to assess the locations for ease of access, stocking levels, and species mix with one site due for immediate harvest and the other scheduled for harvest within the next rotation. Once the sites were selected, Dean contracted with a local certified surveyor to have the sites professionally surveyed and marked on each quad corner with a steel rod (underground) and numbered survey marker cap. This was completed in early November 2013.

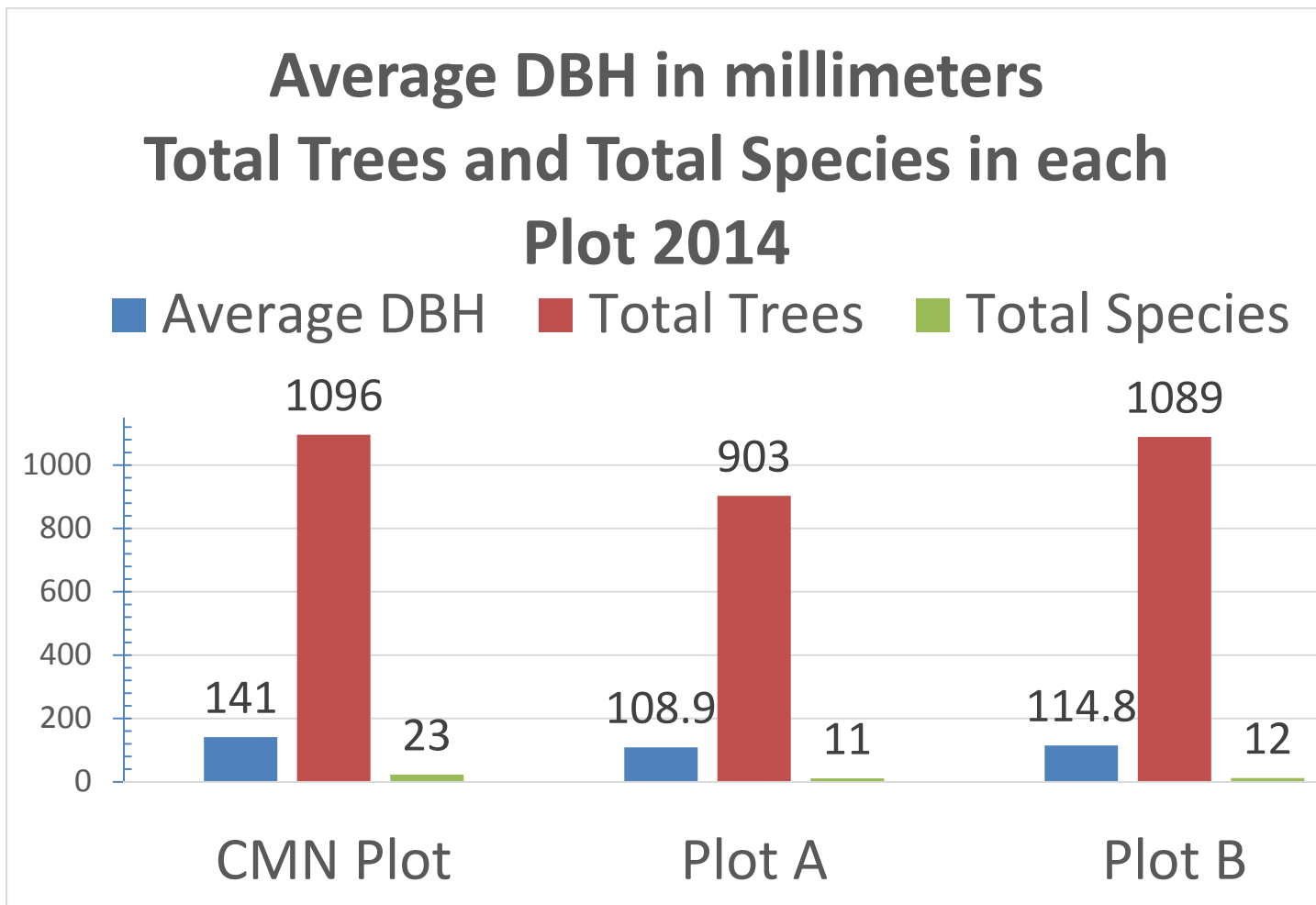
It was determined at this time that in order to complete the census on the training plot and conduct a full census on the two new plots established, we would need 2 Crew Leaders and at least 4 student technicians. The Crew Leader positions were posted in March 2014 and filled in April 2014. In early May 2014 Lincoln Tice and Ron Bowan (Crew Leaders) traveled to SERC in Maryland to participate in the re-census being conducted there to learn the census protocol. Ron and Lincoln spent 2 days traveling, 4 days on the SERC plot learning the protocol techniques and application, and one day touring the Washington D.C. area with Sean including introductions and a personal tour of the SI National Museum of the American Indian. There are some differences in the application of the protocol being used at SERC VS CMN; minimum diameter - SERC 1cm, CMN 2.5cm, tagging height - SERC DBH, CMN .3m, spatial unit of measure - SERC 10m, CMN 20m, as examples. It should also be noted that a re-census is also very different than an initial census, particularly regarding the tagging and mapping techniques used. However, both Ron and Lincoln indicated the experience was very useful and beneficial, especially in having the opportunity to work with a veteran crew to ask questions and have a point of reference when making interpretations (codes) at the Menominee sites.

Upon returning from SERC, Ron and Lincoln used the training plot at CMN to reinforce their understanding of the protocol by completing the census on 8 - 20m quads. During that time SDI retained 4 full-time and one part-time student technicians to work with Ron and Lincoln on completing the census in the training plot to learn the protocol, and then begin the census on the two plots in the Menominee Forest (labeled plots A & B). This work continued throughout the summer of 2014 and concluded with a completion of the census on August 1, 2014. During this time field trips and educational opportunities were embedded to enhance the learning experience, break up the monotony of the census work, and to put the field work into the context of forest ecology. Also during this time, (mid-July) Sean McMahon and Jessica Shue visited CMN to discuss our progress and view the plot sites.

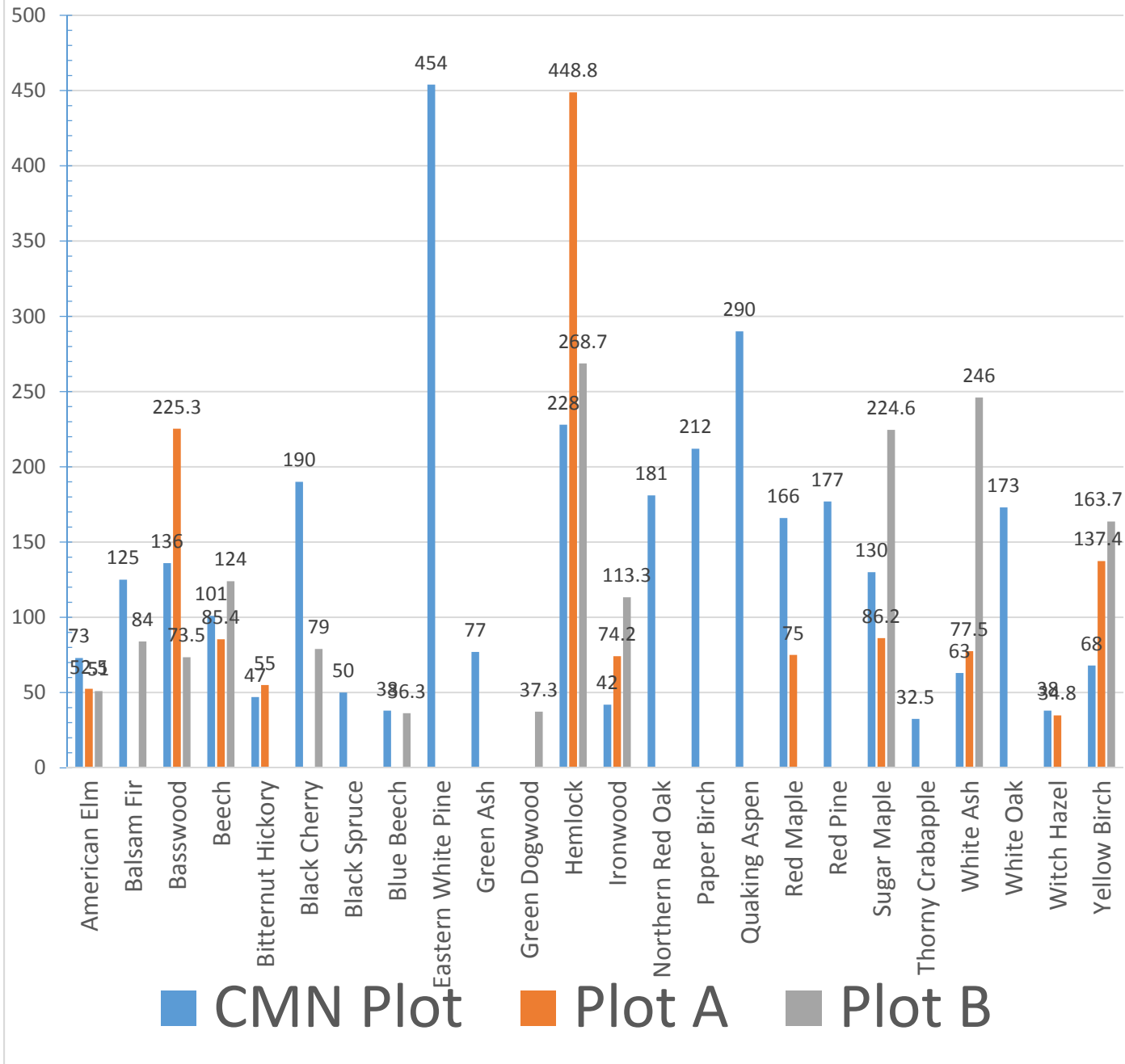
Also during the summer of 2014, CMN/SDI retained a local botanist (Richard Annamitta) familiar with the plant species to conduct a representative survey of the plants within and between the plots. The procedure used was to walk the plots to gain an understanding of what was there, and then select 5 quads within each plot to survey the plants. The intention was to provide a representative sampling of plants reflective of the communities and characteristics of the site(s), not to necessarily conduct a comprehensive survey of every plant present. Rich also spent considerable time with the students both during his survey work and independently.

The summer work concluded with a two-day workshop held at Menominee Casino Resort on August 5/6, 2014. The afternoon of the first day featured a series of presentations related specifically to this project. Dean and Chris gave presentations to frame out the overall project as described in the opening overview statement of this report, and to put the presentations that followed into context. Ron and Lincoln gave a joint presentation on the data collection component and their involvement dating back to the SERC training. The students gave a group presentation on the data collection protocol, followed by individual presentations on what they learned about forest ecology. The second day the emphasis shifted to the cultural piece, which included a presentation by Rich Annamitta. The day concluded with a "field trip" to the training plot during which Ron, Lincoln and some of the students gave a brief demonstration of the data collection procedures used to census the plots, followed by a culturally oriented group discussion.

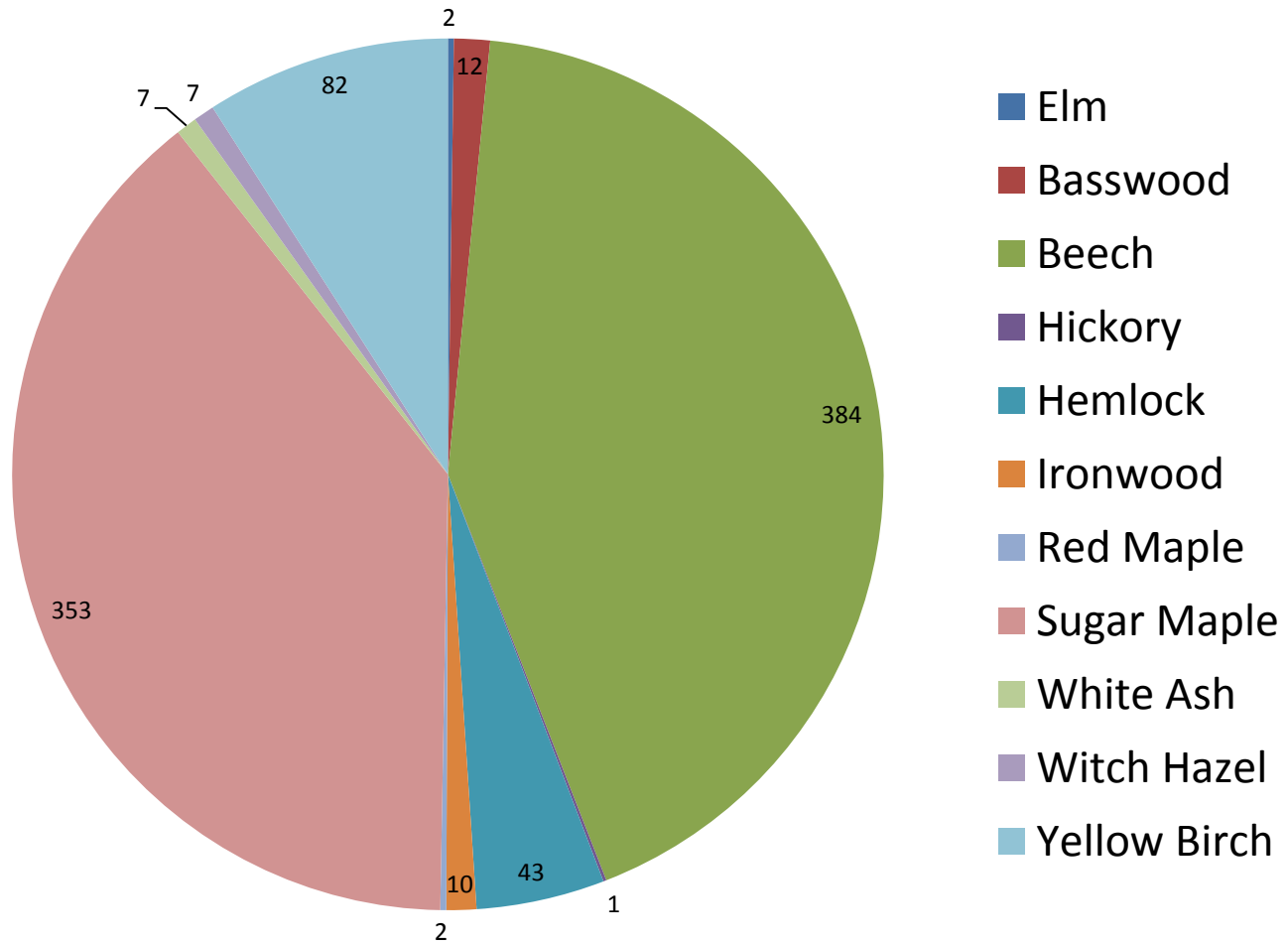
GRAPHS OF TREE CENSUS DATA



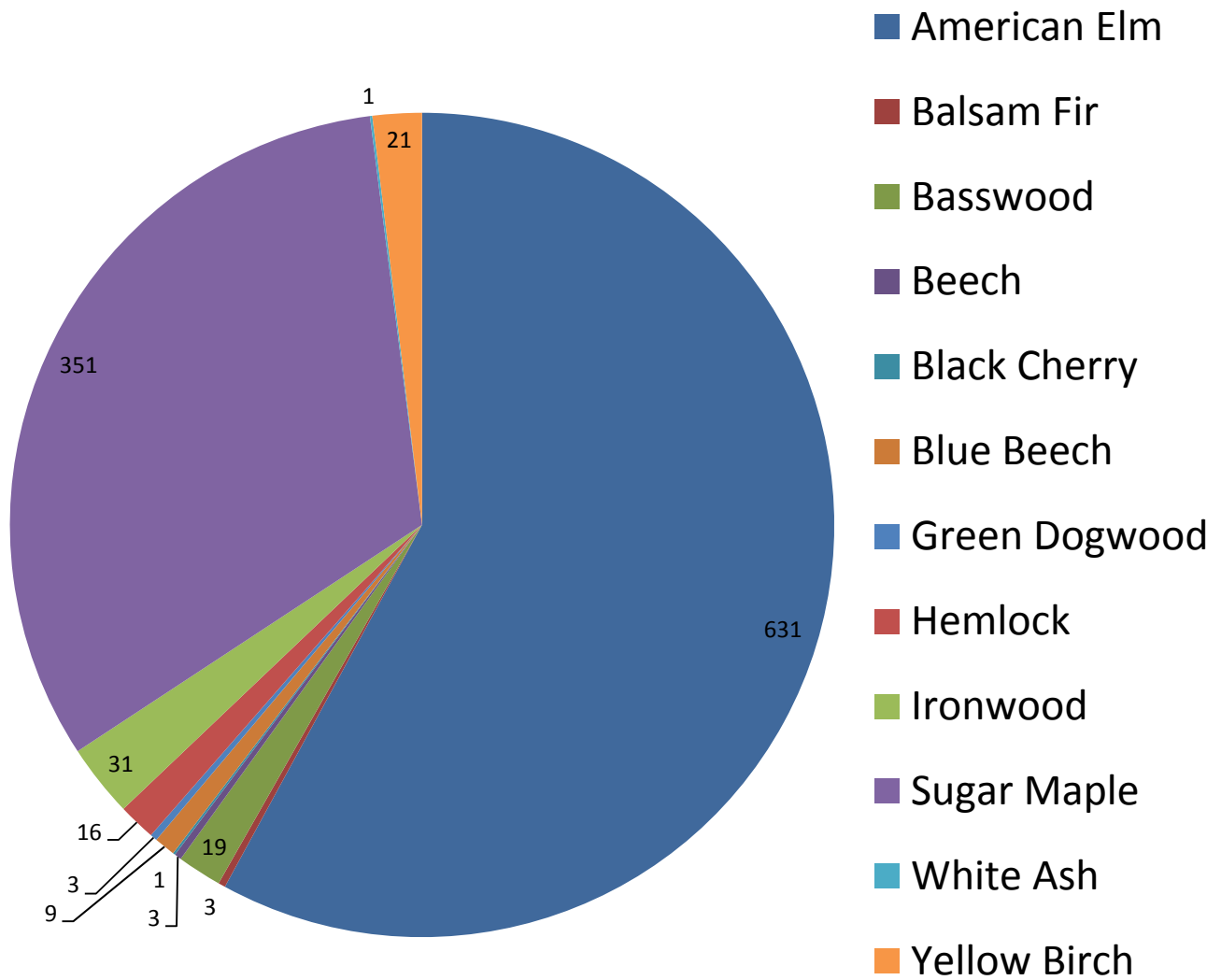
Average DBH in millimeter of tree species by plot 2014



Plot A Number of Trees by Species



Plot B Number of Trees by Species



NARRATIVE SUMMARY OF PLOT GRAPH DATA

The training plot is much more diverse in terms of species, having roughly double the tree species as both plots A & B. All three plots were dominated by two tree species:

- Training plot – Red Maple and Eastern White Pine
- Plot A – American Beech and Sugar Maple
- Plot B – American Elm and Sugar Maple

It is pertinent to remember that plot A was harvested prior to the census (winter 2013/14) and plot B is targeted for harvest in two years (winter 2016/17). The recent harvest is the main factor in the lower tree totals between the three plots, although it should also be noted that significant regeneration is occurring on plot A that will very likely influence these totals should a re-census be conducted within the next 5 years. The graphs have intentionally been kept fairly simple. The main purpose for this effort was to establish a base layer of data, not to try to draw any specific conclusions from the data collected.

BOTANY DATA FROM RICHARD ANNAMITTA (SUBCONTRACTOR)

The plant data collected by Rich will be provided to SI along with this report as a separate attachment. The report is quite lengthy and as an excel spreadsheet format, does not transfer well into the body of this report. The protocol used for the plant identification work was thorough and simple. Rich walked through each plot to get a sense of what plants were there. He then “selected” 5 quadrats in each plot that he felt gave a good representation of the plant species present. He then conducted a 100% survey of the vascular plants (not including mosses and fungi) in those quads. So, the plant inventory is a representative sampling of what is present, not a 100% inventory. Rich took measures to be careful not to be too specific in divulging the specific locations (or quantities) of any culturally sensitive plants (such as Ginseng).

The following information may be helpful in understanding the format Rich used in presenting the data in his spreadsheet. Rich lists the corresponding plot (CMN, A or B) and CMN quad number assigned (1-75). This is the number the CMN crews assigned to each quad to give them a specific and unique ID. Quads 1-25 are in the CMN training plot, 26-50 in plot A, and 51-75 in plot B. Rich also listed the plants in each quad based on the 10m subplot designation with the SW – 10m being subplot 1, NW – subplot 2, NE subplot 3, and SE subplot 4. If there is an “x” in the subplot column, it means the specie listed was identified in that location. In many cases, the same specie was identified in multiple (or even all 4) subplots within a quad.

Rich also took many digital photos of the plants, well over 100. The photos are not included in this report (or as an attachment). He also visited the plots throughout the summer months to verify plants that emerge (or flower) during different times of the growing season (early, middle, or late summer). He did not attempt to reflect this classification in the spreadsheet provided. Rich especially enjoyed working with the students, and we hope to be able to design future projects to continue working with him to formalize much of the supplemental data he collected and build upon the preliminary layer of botanical data he compiled.

FINAL CONCLUSIONS

This was an extremely valuable project from a number of perspectives. We were able to involve 8 different college students in the project over the last 2 years during which we taught them the tenets of forest ecology, botany, and data collection in a place-based environment. As a Land Grant College, it is particularly important for CMN to offer opportunities that connect the “real world” to the classroom and that involve both scientists and practitioners. Additionally, by establishing a foundation that can be used for future studies, learning, training, and research we have effectively expanded our research capacity. Building research capacity was the overarching goal of this effort as stated in the opening of this report.

There were also numerous challenges throughout the project. The initial project scope (grant proposal) was not within the capacity of the timing or resources associated with the funding. A proposal modification with the funding agency had to be requested and approved. Also among our challenges was a general inability to engage staff from UWGB whom we were looking toward for oversight on training, field quality control, and data download. We also met with staff from MTE in September to do a walk through debriefing of Plot B. Unfortunately, they appeared totally unaware of the tagging procedures. They especially didn’t like two tags types within the CFI areas (theirs and ours), and were also concerned about wires girdling small trees and nails/tags being potentially within harvesting cut lines on larger trees. We (SDI) hope to be able to conduct a one-year re-census of all three plots during the summer of 2015 to allow us the opportunity to correct some of MTE’s concerns on Plots A & B.

The bottom line is that while this type of project shows tremendous potential on a number of fronts, there are also issues that must be considered and accounted for when working in a forest setting that is being actively managed. However, it is again important to remember that this project was intentionally down-scaled substantially so that it would serve as a pilot project to expose areas of oversight or miscommunication while minimizing the affects – we did not expect our first effort to be flawless.

The other area that must be addressed to expand upon this work is what direction it will take us. While we are pleased with what we accomplished, establishing a baseline layer of data has limited or marginal long-term value beyond the learning experience if we don’t implement complimentary studies to build upon the initial data collected.

The emphasis in year 3 of the USDA – NIFA award (Measuring the Pulse of the Forest) will shift to the cultural component. While the data collection and cultural components of this project have been conducted somewhat independently, they are strongly connected. We hope (and expect) these dialogues will provide insights and direction to help guide our future research efforts.

Report prepared and issued on 10/24/14 by:

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Sustainable Development Institute

College of Menominee Nation