



TLEF Project – Final Report

Report Completion Date: (YYYY/MM/DD)

1. PROJECT OVERVIEW

1.1. General Information

Project Title:	Enhancing newly established forestry education and demonstration sites at UBC's Malcolm Knapp Research Forest		
Principal Investigator:	David Montwe		
Report Submitted By:	David Montwe, Helene Marcoux, Ionut Aron		
Project Initiation Date:	04/15/2022	Project Completion Date:	04/14/2023
Project Type:	<input type="checkbox"/> Large Transformation <input checked="" type="checkbox"/> Small Innovation <input type="checkbox"/> UDL Fellows Program <input type="checkbox"/> Hybrid and Multi-access Course Redesign Project <input type="checkbox"/> Other: [please specify]		

1.2. Project Focus Areas – Please select all the areas that describe your project.

- Resource development (e.g., learning materials, media)
- Infrastructure development (e.g., management tools, repositories, learning spaces)
- Pedagogies for student learning and/or engagement (e.g., active learning)
- Innovative assessments (e.g., two-stage exams, student peer-assessment)
- Teaching roles and training (e.g., teaching practice development, TA roles)
- Curriculum (e.g., program development/implementation, learning communities)
- Student experience outside the classroom (e.g., wellbeing, social inclusion)
- Experiential and work-integrated learning (e.g., co-op, community service learning)
- Indigenous-focused curricula and ways of knowing
- Diversity and inclusion in teaching and learning contexts
- Open educational resources
- Other: [please specify]



1.3. Final Project Summary – *What did you do/change with this project? Explain how the project contributed toward the enhancement of teaching and learning for UBC students.*

The Faculty of Forestry’s Malcolm Knapp Research Forest (MKRF) provides students in forestry and natural sciences with opportunities for experiential, hands-on learning. Within the research forest, demonstration sites have served as living laboratories for decades, where over 600 students annually put theory into practice. However, many existing demonstration sites were established in the 1950s and have reached the end of their lifespan as teaching tools. In 2013-14 and 2014-15, MKRF successfully applied for successive TLEF grants to design and implement new teaching and demonstration sites, three of which were planted in 2014.

After eight years of growth, the new demonstration sites were ready to be employed in teaching students important principles of forest management; however, the new site initially funded in 2013-2015 required several major updates to make it usable for teaching and learning. With our 2022 TLEF grant we were able employ two student interns to design & implement site forest tending treatments including brushing and thinning, build access trails and design & install interpretive signs, along with gathering baseline tree measurements. We hired two students (one graduate and one undergraduate) to implement this phase of the project.

1.4. Team Members – *Please fill in the following table and include students, undergraduate and/or graduate, who participated in your project.*

Name	Title/Affiliation	Responsibilities/Roles
Yudel Huberman	Graduate Student, Faculty of Forestry	Project lead - Responsible for leading the project, including field work, interpretive sign development
Sarah Law	Undergraduate Student, Faculty of Forestry	Assistant to the project lead

1.5. Courses Reached – *Please fill in the following table with past and current courses (e.g., HIST 101, 2017/2018) that have been reached by your project, including courses not included in your original proposal (you may adapt this section to the context of your project as necessary).*

Course	Academic Year
FRST 452	2022/2023
FRST 351	2022/2023
FRST 547	2022/2023
FRST 557	2022/2023
FRST 305	2022/2023

2. OUTPUTS AND/OR PRODUCTS

2.1. Please **list** project outputs and/or products (e.g., resources, infrastructure, new courses/programs). Indicate a URL, if applicable.

Output(s)/Product(s):	URL (if applicable):
Development of tree dataset with baseline remeasurement (diameter, height, health) and tagging of approx. 1500 trees in the field	
Brushing and maintenance of the 2-hectare demonstration forest	
Development of a permanent gravel covered hiking trail through the demonstration site (approx. 800 m long)	
Creation and installation of 4 large format interpretive signs at the field site	
Creation of educational handouts explaining the use of stand density management diagrams and how they are used for management of the site	

Here is the currently installed sign shelter.



Here is the newly built access trail – prior to this, the site was impassable.



2.2. Item(s) Not Met – Please list intended project outputs and/or products that were not completed and the reason(s) for this.

Item(s) Not Met:	Reason:
We have installed 1 of the 4 signboard – but have 3 remaining signs completed, but not installed	Printing is expensive and the first interpretive signboard was a test to ensure printing quality, etc. The remaining 3 signs will be printed and installed this spring 2023 when the weather improves.

3. PROJECT IMPACT

3.1. Project Impact Areas – Please select all the areas where your project made an impact.

- Student learning and knowledge
- Student engagement and attitudes
- Instructional team-satisfaction



- Teaching practices
- Student wellbeing, social inclusion
- Awareness and capacity around strategic areas (Indigenous, equity and diversity)
- Unit operations and processes
- Other: [Experiential learning]

3.2. Please provide details on each of the impact areas you selected in 3.1. – For example, explain in which ways your teaching practices changed; how student wellbeing was impacted; how students wellbeing benefited from your project, etc.

Student learning and knowledge - Demonstration sites serve as excellent teaching tools to illustrate forest management concepts and how their application changes over time as trees grow. Visualizing forest and tree growth parameters, such as tree density or volume is difficult for students – and forecasting or visualizing how forests will look and grow into the future is very challenging for students. The demonstration sites funded by this TLEF have, so far, enabled several classes of students and two student interns to deepen their knowledge and understanding of stand growth and yield – a fundamental concept and science in forestry. Several classes (e.g. FRST 557) in addition to informal site tours with graduate students from Dr. David Montwe and Dr. Ignacio Barbeito.

Student engagement and attitudes – First off, the two student interns that were employed by the TLEF funds benefitted tremendously from the hands-on work experience and project management experience. They spend 3 months working with Malcolm Knapp Research Forest staff on this project. The graduate student intern led the project and mentored the undergraduate intern. Several other summer interns at the Malcolm Knapp (funded by other grants) also participated in some of the field work. Intern engagement was high, as demonstrated by how much was accomplished in 3 months. Secondly, during field tours with Faculty of Forestry classes (e.g. MSFM, FRST 557), students were highly engaged by the demonstration site, asking pertinent questions and expressing many audible “A-Ha’s!” Or “Ahhh, now this makes sense!” throughout the tour. The demonstration site helps to solidify learning that occurs in the classroom, enabling students to better understand and visualize tree growth and stand dynamics over time across different stand densities.

Experiential learning – Forestry, forest management, forest sciences are applied fields that require meaningful hands-on learning in different forest types, ages, terrain and stand histories. With increasing class sizes and constraints to using forests adjacent to Point Grey Campus (e.g. Pacific Spirit Park) due to environmental impacts, the Malcolm Knapp provides an enduring place for experiential learning. Over the past 10 years, the number of immersive field school courses hosted at the Malcolm Knapp have increased to 6-7 per year. Investments from this TLEF grant into this demonstration site will continue to provide experiential learning for decades to come.



3.3. How do you know that the impacts listed in 3.1/3.2 occurred? – Describe how you evaluated changes/impacts (e.g., collected survey data, conducted focus groups/interviews, learning analytics, etc.) and what was learned about your project from the evaluation. You are encouraged to include graphical representations of data and/or scenarios or quotes to represent and illustrate key themes.

Feedback we received was directly from students and Faculty. We've only solicited informal feedback from students and Faculty at the moment. The undergraduate student intern (Sarah Law) had this to say about his work experience under the TLEF grant: "In my time as the TLEF Undergraduate Intern, I was able to gain a lot of technical experience that I had not had the opportunity to try throughout my education. It was really amazing getting to get outside in the field, and demonstrate experiential learning by using tools such as the GPS and various saws, software such as TIPSY and ArcGIS, and drive around in the Toyota Tacoma. Most of all, I really appreciated all the support from fellow interns and staff that really made this new environment welcoming and comforting for me."

Dr. John Innes (former Dean of the Faculty of Forestry) came for a tour last summer – and he was greatly impressed with the efforts made to incorporate an accessible trail and signage to help classes and tours

4. TEACHING PRACTICES – Please indicate if **your** teaching practices or those of **others** have changed as a result of your project. If so, in what ways. Do you see these changes as sustainable over time? Why or why not?

One of the concepts that this demonstration site helps students learn is the use of “Stand Density Management Diagrams” for the planning of future stand treatments (e.g. thinning or pruning). This concept is incredibly difficult for students to learn without the opportunity to see it in the field, but yet very useful and insightful. We used the handout that the interns prepared for a graduate student field trip (MSFM, FRST 557), and those students relayed to us how helpful that experience and session was. The new materials (handouts and signboards) enhance teaching difficult to explain concepts.

5. PROJECT SUSTAINMENT – Please describe the sustainment strategy for the project components. How will this be sustained and potentially expanded (e.g., over the next five years). What challenges do you foresee for project sustainment?

The demonstration site will be enhanced with time as trees grow – as the trees grow, they exemplify the concepts we're trying to illustrate with the various treatments and densities. Maintenance will be required, but this will be part of the MKRF's annual (in-kind) management. This current TLEF grant assisted with a major milestone of remeasuring 1500 trees 9 years after they were first planted. This monitoring enabled us to forecast next steps required, including different thinning treatments. These will be carried out by MKRF in the future. Our biggest challenge is cost of labor and time – but the new access trail and work carried out with this TLEF grant have positioned us well for these future treatments.



- 6. DISSEMINATION** – *Please provide a list of scholarly activities (e.g., publications, presentations, invited talks, etc.) in which you or anyone from your team have shared information regarding this project. Be sure to include author names, presentation title, date, and presentation forum (e.g., journal, conference name, event). These will be included on the TLEF scholarly output page.*

No scholarly publication have been published at this time.