



TLEF Project – Final Report

Report Completion Date: (2019/03/24)

1. PROJECT OVERVIEW

1.1. General Information

Project Title:	Building Biodiversity: A Campus Resource for Teaching, Learning and Doing		
Principal Investigator:	Dr. Santokh Singh, Botany, Faculty of Science		
Report Submitted By:	Liska Richer, SEEDS Sustainability Program, Campus + Community Planning		
Project Initiation Date:	May 1, 2016	Project Completion Date:	Aug 30, 2017
Project Type:	<input type="checkbox"/> Large Transformation <input checked="" type="checkbox"/> Small Innovation <input type="checkbox"/> Flexible Learning <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: [-Interdisciplinary collaborations/network; - Knowledge Dissemination]



1.3. Project Summary

The *Building Biodiversity: A Campus Resource for Teaching, Learning and Doing* project is a collaborative, cross-campus project that brings together undergraduate and graduate students, faculties, schools and operational partners to develop applied research, teaching and learning tools, and opportunities to foster biodiversity stewardship on campus. The project created publically accessible web resources including a biodiversity website, asset map and people tree. In the project’s first year, 36 applied urban biodiversity research projects were created with 26 faculty members and over 30 staff and community partners. Projects were integrated into 23 campus courses, spanning seven faculties and schools. The project provided a unique teaching and learning opportunity that provided faculty opportunities to integrate applied research and tools into their curriculum, and students with the opportunities to conduct impactful research and contribute to teaching and learning tools. In addition, the research and tools developed as a result of this project informed resource management, community education and engagement, and planning decisions on campus. Various outreach and engagement activities were produced including a Biodiversity Showcase that brought together over 100 people to share project outputs including student-led biodiversity research projects, web resource, the 1st addition of a Biodiversity Annual Report, and other notable progress and milestones from these student, faculty and staff collaborations on this critical topic of urban biodiversity.

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
Santokh Singh	Professor of Teaching, Botany, Faculty of Science	<input type="checkbox"/> Principal Investigator <input type="checkbox"/> Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee <input type="checkbox"/> Professor (oversaw related course projects)
Liska Richer	Manager, SEEDS Sustainability Program, Campus + Community Planning	<input type="checkbox"/> Project Supervisor <input type="checkbox"/> Co-Chair, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee
Cynthia Girling	Professor, School of Architecture and Landscape Architecture,	<input type="checkbox"/> Project Advisor <input type="checkbox"/> Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee <input type="checkbox"/> Professor (oversaw related course projects)
Stephen Sheppard	Professor, Forest Resources Management, Faculty of Forestry	<input type="checkbox"/> Project Advisor <input type="checkbox"/> Member, Campus Biodiversity Initiative: Research &



		<p><i>Demonstration (CBIRD) Steering Committee</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> <i>Professor (oversaw related course projects)</i>
<i>Brent Skura</i>	<i>Associate Professor Emeritus, Global Resource Systems, Faculty of Land and Food Systems</i>	<ul style="list-style-type: none"> <input type="checkbox"/> <i>Project Advisor</i> <input type="checkbox"/> <i>Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i> <input type="checkbox"/> <i>Professor (oversaw related course projects)</i>
<i>Jordi Honey-Roses</i>	<i>Assistant Professor, School of Community and Regional Planning</i>	<ul style="list-style-type: none"> <input type="checkbox"/> <i>Project Advisor</i> <input type="checkbox"/> <i>Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i>
<i>Rick Taylor</i>	<i>Professor, Zoology, Faculty of Science and Director, Beaty Biodiversity Museum,</i>	<ul style="list-style-type: none"> <input type="checkbox"/> <i>Project Advisor</i> <input type="checkbox"/> <i>Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i>
<i>Sally Otto</i>	<i>Professor, Zoology, Faculty of Science and Director, Centre for Biodiversity Research</i>	<ul style="list-style-type: none"> <input type="checkbox"/> <i>Project Advisor</i> <input type="checkbox"/> <i>Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i> <input type="checkbox"/> <i>Professor (oversaw related course projects)</i>
<i>Tara Moreau</i>	<i>Associate Director/Sustainability and Community Programs, UBC Botanical Garden and Centre for Plant Research</i>	<ul style="list-style-type: none"> <input type="checkbox"/> <i>Project Advisor & Co-Lead</i> <input type="checkbox"/> <i>Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i>
<i>Jacqueline Chambers</i>	<i>Education and Outreach Manager, Beaty Biodiversity Museum</i>	<ul style="list-style-type: none"> <input type="checkbox"/> <i>Project Advisor</i> <input type="checkbox"/> <i>Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i>
<i>Darren Irwin</i>	<i>Professor, Zoology, Faculty of Science</i>	<ul style="list-style-type: none"> <input type="checkbox"/> <i>Project Advisor</i> <input type="checkbox"/> <i>Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i>



<i>Ildiko Szabo</i>	<i>Assistant Curator of Birds, Beaty Biodiversity Museum,</i>	<input type="checkbox"/> <i>Project Advisor</i> <input type="checkbox"/> <i>Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i>
<i>Douglas Justice</i>	<i>Associate Director/Horticulture & Collections, UBC Botanical Garden,</i>	<input type="checkbox"/> <i>Project Advisor</i> <input type="checkbox"/> <i>Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i>
<i>John Madden</i>	<i>Director, Sustainability and Engineering, Campus and Community Planning</i>	<input type="checkbox"/> <i>Project Advisor</i> <input type="checkbox"/> <i>Co-Chair, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i>
<i>Scot Hein</i>	<i>Urban Designer, Campus and Community Planning,</i>	<input type="checkbox"/> <i>Project Advisor</i> <input type="checkbox"/> <i>Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i>
<i>Jeff Nulty</i>	<i>Municipal Landscape Architect, Building Operations</i>	<input type="checkbox"/> <i>Project Advisor</i> <input type="checkbox"/> <i>Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i>
<i>Douglas Justice</i>	<i>Associate Director, Horticulture & Collections, UBC Botanical Garden</i>	<input type="checkbox"/> <i>Project Advisor</i> <input type="checkbox"/> <i>Member, Campus Biodiversity Initiative: Research & Demonstration (CBIRD) Steering Committee</i>
<i>Anna Thomas</i>	<i>Student</i>	<input type="checkbox"/> <i>Biodiversity Project Coordinator</i>
<i>Emily Rennalls</i>	<i>Student</i>	<input type="checkbox"/> <i>Biodiversity Academic Coordinator</i>
<i>Joanne Pearce</i>	<i>Student</i>	<input type="checkbox"/> <i>Biodiversity Web Coordinator</i>

1.5. Courses Reached – Please fill in the following table with **past**, **current**, and **future** courses and sections (e.g. HIST 101, 002, 2017/2018, Sep) that have been/will be 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	Section	Academic Year	Term (Summer/Fall/Winter)
Total of 23 courses with applied research projects integrated into the following courses:			
ARCH 557A	001	2016-2017	Fall



BA 530A	001	2016-2017	Spring
BIOL 351	L10	2016-2017	Fall
BIOL 448A	101	2016-2017	Summer/Fall
ENDS 482	001	2016-2017	Summer
ENVR 400	001	2016-2017	Fall/Winter
FRST 424	001	2016-2017	Winter
FRST 449	101	2016-2017	Summer
FRST 551	201	2016-2017	Winter
GEOB 472	001	2016-2017	Winter
GEOG 371	001	2016-2017	Winter
GEOG 446	001	2016-2017	Fall/Winter
GEOG 448	001	2016-2017	Summer/Fall
GRS 397	001	2016-2017	Winter
ISCI 448	001	2016-2017	Fall/Winter
LARC 424	001	2016-2017	Winter
LARC 515	001	2016-2017	Fall
LARC 542	001	2016-2017	Winter
LARC 581B	002	2016-2017	Winter
MECH 457	001	2016-2017	Fall/Winter
PLAN 526	001	2016-2017	Fall/Winter
PLAN 528	001	2016-2017	Fall
PSYCH 321	001	2016-2017	Winter



2. OUTPUTS AND/OR PRODUCTS

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

Product(s)/Achievement(s):	Location:
Teaching, Learning and Research:	
<ul style="list-style-type: none"> • 23 courses with applied biodiversity projects integrated • 26 faculty members representing 8 faculties provided oversight and expertise to students, and integrated projects into their courses • 150 UBC students directly engaged from nine departments in eight faculties and schools, including: Faculty of Science, Faculty of Forestry, Faculty of Arts, Faculty of Applied Science, Faculty of Land and Food Systems, School of Community and Regional Planning, School of Architecture and Landscape Architecture, Sauder School of Business • 36 applied research projects completed contributing to biodiversity on the UBC Vancouver campus • 30 staff and community partners engaged on biodiversity issues, using student research and findings to inform biodiversity-related decision on the UBC Vancouver campus 	<ul style="list-style-type: none"> - List of courses with applied research project integrated (See section 1.5)
Partnership Development and Interdisciplinary Collaborations:	
<ul style="list-style-type: none"> • A Biodiversity Steering Committee formed and comprised of biodiversity stakeholders across 17 UBC departments and operational units, who provide high-level oversight and guidance to the <i>Campus Biodiversity Initiative: Research & Demonstration (formally Biodiversity Project)</i>. Through the extended networks of the committee’s individual members, the Steering Committee helps advance interdisciplinary relationships across faculty and operational units. 	https://kumu.io/seedsbiodiversitycoordinator/cbird-stakeholders-and-partners#cbird-stakeholders-and-partners
Impact on Advancing Biodiversity:	
36 applied research projects completed contributing to biodiversity on the UBC Vancouver campus	
Research contributed to the development of campus sustainability plans and policies including UBC’s Green Building Action Plan, Bird-friendly Building Guidelines, and emerging UBC Forest Management Plan and Biodiversity Strategy.	
Knowledge Dissemination:	
<ul style="list-style-type: none"> • Biodiversity Showcase: Building Biodiversity <ul style="list-style-type: none"> - 8 student groups presented their research with over 100 faculty, staff, student and community partners who attended the event 	Beaty Biodiversity Museum, UBC
<ul style="list-style-type: none"> • 2017 TLEF Showcase – Celebrate Learning Week <ul style="list-style-type: none"> - Poster Presentation featured showcasing project highlights 	Earth Sciences Building, UBC
<ul style="list-style-type: none"> • 2017 UBC Sustainability Soiree <ul style="list-style-type: none"> - Biodiversity research featured to over 150 attendees at this signature event which celebrates UBC’s sustainability champions who contribute to making UBC a global sustainability leader 	Robert H. Lee Alumni Centre
<ul style="list-style-type: none"> • Campus Biodiversity Initiative: Research & Demonstration: Annual Report (2016-2017) published 	Website: https://sustain.ubc.ca/sites/sustain.ubc.ca/files/S



	EEDS%20Uploads/UBC_BiodiversityAnnualReport_FINAL.pdf
Open Educational Resources:	
<ul style="list-style-type: none"> Biodiversity Website completed 	https://sustain.ubc.ca/teaching-applied-learning/seeds-sustainability-program/cbird
<ul style="list-style-type: none"> Biodiversity Asset Map – phase 1 complete 	https://www.google.com/maps/d/viewer?mid=1J8rKJRJDY6FVeb8TGpDvhGT3mCo&ll=49.25987378990546%2C-123.24296072537231&z=14
<ul style="list-style-type: none"> Biodiversity People Tree - phase 1 completed 	https://kumu.io/seedsbiodiversitycoordinator/cbird-stakeholders-and-partners#cbird-stakeholders-and-partners

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

Item(s) Not Met:	Reason:
N/A	

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 teaching practice and satisfaction
- Student wellbeing, social inclusion
- Awareness and capacity around strategic areas (indigenous, equity and diversity)
- Unit operations and processes
- Other: [please specify]



3.2. What were you hoping to change or where were you hoping to see an impact with this project? – Please describe the intended benefits of the project for students, TAs, instructors and/or community members.

- The UBC Biodiversity Asset Map, People Tree and website are publically accessible resources. The provision of this publically accessible knowledge can inspire future research, partnerships and contributions to enhancing biodiversity stewardship on campus. These resources can be further integrated in the curriculum as teaching, learning and research tools and resources.
- The formation of a campus-wide Biodiversity Steering Committee can encourage new interdisciplinary partnerships and applied research projects to further advance efforts in maintaining and enhancing biodiversity ideas, policies and practices through the generation of new curricular opportunities and partnerships, as well as outreach and engagement activities.
- The 36 applied urban biodiversity research projects created recommendations for further action and research. As a result, new actions and projects can be scoped and build off the previous work and move the dial on this critical sustainability subject matter.
- Through the direct student participation in 23 courses through applied research projects, students had opportunities to connect course-based learning to the physical and planning operations of the campus, making urban biodiversity subject matter more tangible and meaningful, and providing opportunities for mentorship and real-world experiences that can equip them for future careers.
- The relationships formed as a result of this project have led to multi-year curricular partnerships and greater commitment to contribute to a broader and more in-depth baseline of our campus natural assets. In addition, these relationships led to unexpected efforts to create demonstrative and scalable pilots that enhance urban biodiversity and provide ongoing teaching, learning and research opportunities while using the Campus as a Living Laboratory.
- The research dissemination activities held including the public showcase events, spurred new long-term collaborations and will continue to contribute to the growth of urban biodiversity networks and impactful changes.

3.3. Were these changes/impacts achieved? How do you know they occurred? – What evaluation strategies were used? How was data collected and analyzed? You are encouraged to include copies of data collection tools (e.g. surveys and interview protocols) as well as graphical representations of data and/or scenarios or quotes to represent and illustrate key themes.

- Anticipated impacts were achieved including:
 - o Completion of the first phase of the Biodiversity Asset Map and People Tree contributing general knowledge needed to scope future phases
 - o Integration of the above mentioned biodiversity web-resources into teaching, learning and research activities, providing students with meaningful applied learning opportunities
 - o 36 applied urban biodiversity research projects created, integrated into 23 courses with 26 faculty members and over 30 staff and community partners, spanning seven faculties and schools.
 - o Interdisciplinary collaborations formed including the development of a highly engaged and ongoing Biodiversity Steering Committee who provide ongoing advisory guidance on direction of the project. Terms of Reference (ToR) and sub-working committees formed.



- Successful development and implementation of public outreach events and materials that increasing awareness and engagement in urban biodiversity issues, and
- Research and tools informed campus resource management, community education, engagement, and planning decisions.
- Each participant received an end of term electronic survey upon the completion of the research project to assess overall satisfaction, impacts on teaching and learning experiences, and implementation potential for key findings and recommendations.
- Each attendee or participant in public research and outreach dissemination events received an opportunity to provide feedback regarding their experience and impact of the events.
- Opportunities to elicit qualitative feedback were regularly provided at the Biodiversity Steering Committee meetings, and end of term project presentations and follow up meetings.

3.4. Dissemination – Please provide a list of past and upcoming scholarly activities (e.g. publications, presentations, invited talks, etc.) in which you or anyone from your team have shared information regarding this project.

Academic Year	Dissemination Activity	Location
2016-2017	Biodiversity Showcase: Building Biodiversity	Beaty Biodiversity Museum, UBC
	2017 TLEF Showcase – Celebrate Learning Week - Poster Presentation	Earth Sciences Building, UBC
	Campus Biodiversity Initiative: Research & Demonstration: Annual Report (2016-2017)	Website: https://sustain.ubc.ca/sites/sustain.ubc.ca/files/SEEDS%20Uploads/UBC BiodiversityAnnualReport_FINAL.pdf
2017-2018	Biodiversity Showcase: Biodiversity for Resilient Communities	Botanical Garden, UBC
	Richer, L. (October 3, 2018). Rising to the Global Biodiversity Challenge: A New Model at the University of British Columbia (UBC). Association for Advancement of Sustainability in Higher Education (AASHE) 2018 Conference - Global Goals: Rising to the Challenge.	Pittsburgh, Pennsylvania.
	Mesure, M., De Groot, K., Duncan, A., Richer, L. (August 24, 2018). Birds and Building Collisions. Stewardship Roundtable: A forum and showcase of innovative practices for bird and wildlife conservation. 27th International Ornithological Congress.	Vancouver, British Columbia.



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?*

The project team worked with 23 courses and 26 faculty to support the curricular integration of applied biodiversity projects. In most cases, this involved working with faculty to integrate applied research projects and assignments that aligned with the course learning objectives, and to develop new staff and community partnerships to support the projects. Each project contributed to the development of a biodiversity web resource and generated impactful research that could deepen students understanding of biodiversity, contribute to a broader biodiversity baseline, and to the advancement of biodiversity ideas, policies and practices.

As a result of these broad-based collaborations, multi-year and interdisciplinary partnerships have been formed where impactful biodiversity projects are embedded in the curriculum. Many faculty serve as members on the CBIRD Steering Committee, which serves as an interdisciplinary collaboration with representatives from 17 faculties and operational departments and provides ongoing advisor support to advance the CBIRD mandate including the integration of impactful biodiversity research and resources into courses.

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 achieving the expected long-term impacts listed above?*

Since receiving this grant, other funding sources from internal and external organizations have been successfully leveraged, as well as in-kind resources from project partners. Currently, we have submitted other funding applications to help sustain this initiative in the long term. Challenges stem from uncertainty of obtaining long-term funding needed to enable the continuation of the project, and the team remains optimistic in working with current capabilities to secure both cash and in-kind funding.