

Course Title:	Restoration Ecology: From Microbes to Trees to Fish
Instructor(s):	Dr. John Gunn, jgunn@laurentian.ca , Dr. Nadia Mykytczuk, Dr. Peter Beckett, Dr. Graeme Spiers, Dr. Nathan Basiliko Vale Living with Lakes Centre, Laurentian University
Dates:	Monday, August 17 to Saturday, August 29, 2020
Location:	2 Field Camps: Hannah Lake, Sudbury and Research Centre, Killarney Park
Cost:	\$1200. [\$350 deposit to home university; \$850 balance due Aug.1, 2020] Travel to and from Sudbury and return from Killarney not included. Course fee includes accommodation, board, and all in-course travel (excludes fish and chips in Killarney)
Prerequisites:	All registrants in the course must be able to swim and are physically fit for extensive hiking and overnight camping. One of ecology, plant biology, limnology or soil science are recommended. Introductory statistics will also be an important asset.
Enrolment*:	12 students
Course Description (brief):	<p>The field course is an experimental and research based study of natural and assisted recovery in the Sudbury Basin at one of the most famous environmental success sites in the world. Magnificent Killarney Provincial Park will serve as a comparative reference study for the mining study sites in Sudbury. Lab facilities within the “Living with Lakes Centre” will also be available to students (www.livingwithlakes.ca).</p> <p>Our approach is to create research teams and immerse students in challenging research projects while introducing them to methods and analytical techniques that are designed to trigger their interests to pursue further studies in environmental sciences.</p> <p>Participants will learn standard sampling techniques for water, soil, zooplankton, benthic invertebrates and early successional forests, as well as in situ and lab methodology for assessing toxicity and biomolecular techniques for characterizing microbial communities.</p> <p>Water based recreational activities in Sudbury (Dragon boating) and canoeing and hiking in remote reference sites in Killarney Wilderness Park will instruct, delight and provide some fun.</p> <p>On the first day of the course, each student will be required to present a 20-minute seminar and provide a brief written summary on an assigned topic (topics selected in May 2020). These seminars must be prepared in advance. Each student must submit a scientific paper in journal format on the data collected by their research team, one month after the fieldwork is completed. (Note: In past courses several groups actually succeeded in getting their reports published as journal papers.)</p>
Evaluation:	<p>20% seminar</p> <p>10% field notes and quizzes</p> <p>20% participation</p> <p>50% research paper due one month after the course</p>

An Average Day – What to Expect

(a) Daily timeline	<p>The camp in Sudbury is located on a small lake approximately 10km out of town in a treed area but within sight and sound of a highway (no stores nearby). Our final day in Killarney involves tenting, swimming, canoeing and hiking in a wilderness park with a meal time visit to the village itself.</p> <p>7:00 breakfast, 7:45 ready to depart with lunches and daypack (away all day), 8:00 field work rain or shine, 12:00 lunch break at the research centre or in the field , 13:00pm continue field and lab work, 17:30-18:30 dinner, 18:30-20:30 lectures, seminars and sample processing, 20:30-21:00 return to camp; usually followed by a hot sauna, swim snack and sleep. The camp is run by a Finnish community member as part of a church group. Lovely people.</p>
(b) Work habitat & Physical exertion	<p>Good physical fitness is a great asset for enjoying field camp so that you can fully engage in all the outdoors activity. Time is always in short supply as we hike trails, carry, dig, wade and paddle across the exposed and rocky landscape and try to get home in time for dinner. People have always been good to help each other but no one wants to unnecessarily slow down the group. Note: You must be able to swim and with a little training should be able to learn to get back into a canoe if it flips (yes, we practice this).</p>
(c) Common activities	<p>Describe:</p> <ul style="list-style-type: none"> • While carrying day packs and gear you'll be travelling in groups of 3-5. You'll be hiking up rocky trails to sampling location with little to no shade, canoeing or boating across lakes, setting nets and traps, wading and sampling streams with long days in trucks on highways and gravel roads etc. • Common sense is needed to avoid blisters, bear encounters, dehydration or heat exhaustion (e.g. hats, sun screen, drinking lots of water, rest breaks). We are careful to avoid thunderstorms and lightening.
(d) Weather, dehydration, & biting insects	<p>Describe:</p> <ul style="list-style-type: none"> • The daily temperature ranges from 15-30°C with high sun exposure. In late August mosquitoes and black flies have had most of their fun already and conditions are much improved, except for pesky deer flies.
(e) Toxic/poisonous, wildlife/ plants	<p>There are usually bees and wasps and perhaps exposure to poison ivy but not many risks exist from small creatures except for those students with severe allergies. Black bears are very common at our study sites, so we provide an educational video and the group leaders carry pepper spray. We have not had problems to date. Most bears are seen while driving or boating. They usually disappear quickly when they hear, smell and see our student groups.</p>
(f) Sleeping, washroom & laundry facilities	<ul style="list-style-type: none"> • At the Sudbury camp, students stay in dorm style rooms, 2-3/room in single gender groups. No bedding is provided. You are required to bring a sleeping bag and your own pillow. Flush toilets are available. There is a shower but there is a 5min limit per person – no exceptions. There are no laundry facilities available but there is a sink and a clothesline for swimming suits and towels etc. At the Killarney camp accommodations are in a single or shared tent. You need a sleeping pad, a flashlight, sleeping bag, pillow etc. There will be flush toilets nearby.
(g) Meal plans & food allergies	<p>Very good hardy meals provided, with vegetarian options available but with limited variety. Usually very good bread and desserts and a good variety of options for students to pack their own lunches after breakfast.</p> <p>With advance notice the cooks do their best to support individual student needs and allergies, however a strict vegan, celiac, or other restrictive diet would be challenging and these students should bring extra foods at their own costs if necessary.</p>
(h) Non-academic responsibilities	<p>N/A</p>
(i) Degree of isolation	<ul style="list-style-type: none"> • There is no wifi and few electrical outlets at the camp. Good opportunities to connect with web and research while on campus at Laurentian University • No readily walkable stores but occasional stops are made to pick up supplies, go to pharmacies, etc.
(j) Alcohol & drugs	<p>No alcohol, narcotics or smoking at camp. Killarney wilderness park has a complete can and bottle ban.</p>
(k) Vaccinations/ Insurances	<p>No special vaccinations or insurance required. A waiver form must be filled out prior to participation.</p>
(l) Social Situations	<p>Field camp is a close knit team activity, a very social time with students spending a lot of time together in close quarters for projects, meals etc. Most groups have a great time and many remain life long friends and future colleagues. Students who need a lot of privacy tend not to enjoy field camp. Groups usually like to meet the local people, talk with the camp staff and are caring and supportive of each other, especially in their project group as they share data and the long hours of working together.</p>
(m) Final comments	<p>Our field camps are usually designed to give students an intense experience of what it may be like to be a graduate student or professional scientist. Many students have been turned on to science during field camp in a way the lecture hall may fail to do.</p>