THE UNIVERSITY OF BRITISH COLUMBIA

Curriculum Vitae for Faculty Members

Date: Oct 19, 2012 **Initials**:

1. **SURNAME**: ELLIS **FIRST NAME**: SHONA
MIDDLE NAME: MARGARET

2. **DEPARTMENT/SCHOOL:** BOTANY DEPARTMENT, UNIVERSITY OF BRITISH COLUMBIA

3. **FACULTY**: SCIENCE

4. **PRESENT RANK**: PROFESSOR OF TEACHING **SINCE**: JULY 1, 2012

5. **POST-SECONDARY EDUCATION**

University or Institution	Degree	Subject Area	Dates
University of British Columbia	BSC	Botany	1980 - 1985
University of British Columbia	MSC	Plant Biochemistry	Jan. 1, 1989 – July 16, 1993

Special Professional Qualifications

6. **EMPLOYMENT RECORD**

(a) Prior to coming to UBC

University, Company or Organization	Rank or Title	Dates
Maple Ridge Senior Secondary	Student	1978 - 1980

(b) At UBC

Rank or Title	Dates
Professor of Teaching	July 1, 2012 - present
Associate Head of Biology	July 1, 2011 - present
Director Combined Major in Science	Feb. 2010 – July 1, 2011
Director General Science	Feb. 2008 – July 1, 2011
Senior Instructor	July 1, 2007 – July 1, 2012
Instructor	July 1, 2002 – July 1, 2007
Lecturer	July 1, 2001 – June 30, 2002
Sessional Lecturer	Aug. 13, 2000 – June 30, 2001

Sessional Lecturer (half-time)	Sept. 1, 1998 – Aug. 13, 2000
Academic Advisor (half-time)	Sept. 1998 – Aug. 13, 2,000
Sessional Lecturer	Sept. 1, 1994 – Aug. 31, 1998
Graduate Student Teaching Assistant	Sept.. 1, - Apr. 30 1989 - 1993
Graduate Student Research Assistant	May 1 – Aug. 311980 – 1993
Graduate Student Research Assistant	Jan. 1, 1989 – Aug. 31, 1989
Technician Research Assistant, Gr 1	Jan. 1, 1985 – Dec. 31, 1989
Technician Research Assistant, Trainee	Oct. 1, 1984 – Dec. 31, 1984

7. LEAVES OF ABSENCE

University, Company or Organization at which Leave was taken	Type of Leave	Dates

8. TEACHING

(a) Areas of special interest and accomplishments

My primary focus in teaching is to help students share my enthusiasm for the botanical world. I find all areas of biology interesting, but plants are particularly fascinating from their structure and chemistry to their place in ecosystems. As an instructor at one of the top research universities in Canada I am able to pursue my intellectual interests in plant biology, keep up to date with advances both scientifically and pedagogically, and incorporate them into my teaching. Connecting students with research at UBC makes their studies more meaningful and helps them to identify as scientists. Sharing the wonder of bryophytes and other organisms is an important part of teaching, but a very intriguing aspect is “learning”. Facilitating deep understanding (and knowledge retention) is integral to providing a good education. My own experience as a student, observations, and what I learn through reading, research, and workshops shapes the strategies I take in the classroom, lab, field, and website. Diversity in the ways students interact with content deepens understanding and helps them develop their own conceptual frameworks. Using different modes of instruction such as lecture, lab, and fieldtrips provide students with this multidirectional approach. I take pride in labs I develop, incorporating as much living material as possible and making links with lecture and the natural world. Additional lab projects where students collaborate to collect and analyze data are invaluable experiences for them as they develop as scientists (examples include tissue culture, scanning electron microscopy, and antibiotic assay projects). Field components reinforce material as well as get students involved with the community. For example, projects with the Camosun Bog Restoration Group and the Stanley Park Ecological Society give students the opportunity to make meaningful contributions while participating in course activities such as plant collections, data collection/analysis, and projects.

I have been keenly interested in the value of course websites in teaching and learning. The websites for all of my courses are robust and contain primarily materials I have developed. They support student learning in a number of ways. The Vista sites provide a focal point for the courses and promote outside-of-class interactions. They present lab and lecture materials as well as a substantial amount of original images from the field and lab. In addition to general administration such as syllabus and calendar, other lecture and lab instruction is strongly supported with organized presentation of learning objectives, course notes, powerpoints, images from lab

activities (and related materials), self-tests, quizzes, assignments, and study guides. I keep up to date with new learning technologies by participating in workshops (e-learning combined with pedagogy) as well as being involved with pilot projects (I am currently participating in the Blackboard pilot). Developing a learning environment in an online format is very powerful.

I got involved in e-portfolio and "folio" learning as I realized the increasing significance of digital identity. I wanted to use an online platform to get students more engaged with course material. It seemed an opportunity for students to build identities as scientists and make the transition from novice to expert learners. Joanne Nakonechny and I participated in the e-portfolio UBC pilot project to explore student learning using a platform on which students would participate in reflection activities. Learning gains were identified when students collaborated with other students and peer evaluation was incorporated. See 'Scholarly and Professional Activities, (a) Areas of Special Interests and Accomplishments' for more details (page 14).

Curriculum development has been challenging, yet very satisfying as it has big impacts on student learning. I have been involved at the program level for General Science, Combined Majors in Science, and Biology. For each specialization I served as committee chair and oversaw all aspects of curriculum generation and reform. I participated on the course development committee for SCIE 300 (Communicating Science, required course for Combined Major in Science). This was the first time I worked on course development as part of a large interdisciplinary group. For most of the courses I teach I design lectures, labs, and fieldtrips. A well-crafted program that generates good learning experiences, enthusiasm, and promotes lifelong learning is what I strive for whether it be through the development of my own courses or through curriculum planning.

I am very proud to be part of the restructuring of the biology program. It provides students with an education that builds on fundamental concepts throughout and offers experiential opportunities. To obtain resources for this reform I applied to CWSEI (Carl Wieman Science Education Initiative) and received three years support to hire 5 STLFs (Postdoctoral Science Teaching and Learning Fellows) as well as additional TAs and undergraduate assistants. The initial focus is the transformation of the second year fundamentals courses with a look to build vertically through the curriculum (first to fourth year) and across discipline areas. I chaired the interview committee for the STLF hires as well as liaise with the fundamentals working groups on a regular basis. In my role as Associate Head of Biology I see it my responsibility to implement the new biology program. This includes coordinating advising both face-to-face as well as online.

e-Portfolio**: http://blogs.ubc.ca/shonaellis**

TEACHING PHILOSOPHY

My philosophy of teaching is really about learning. Teaching practices should focus on the best methods to facilitate student understanding and motivate inquiry. The scholarship in teaching/learning is an exciting part of being an instructor; keeping up with current developments in education and devising and assessing better ways to help students learn is challenging. If you succeed you can be a good teacher. A good educator has many qualities: a fascination with the subject, a commitment to generating enthusiasm and interest, is organized, challenging, perceives student needs, provides constructive feedback, and is respectful. An excellent teacher does all of these, and something a little extra that results in a positive change (transformation) in the student. This shift could be an ignited interest in a subject or an attitudinal change about science. I want to be a teacher than inspires students and helps them change the way they see biology and their world. To all my courses I bring a genuine enthusiasm for the organisms from their tissues and cells to their roles on our planet. I am equally enthusiastic about sharing these wonders with others and their integration with the dynamics of teaching and learning.

Learning happens best in a safe, supportive, stimulating environment. A positive outlook on course content leads to improved retention and deeper understanding. Most of the learning however, does not happen in the classroom. So what is the purpose of lectures? Their most valuable function is to help students develop a conceptual framework with which to relate information. Students often have their own way of viewing and organizing information that is simple and may or may not be accurate. Lectures provide a forum for us to provide students with more than just the facts. I like to share other elements such as research at UBC, local uses of a particular plant, a current environmental issue, and images that help to put information in context. Making connections helps students learn and construct a framework on which they can build. Relating what they are learning with their own lives is very powerful.

There is lots of emphasis on active learning activities and rightly so. We learn by doing. Students need to be engaged and interacting with information with their full attention. Clickers are excellent tools for such engagement; in addition to active learning, they can be used to initiate discussion, motivate pre-readings, identify misconceptions, improve class attendance, connect ideas, promote reflection, and make students aware of their performance in relation to the entire class. Other effective active learning activities include question/answer, true/false question game, discussions (e.g. think pair share), and writing short answers (e.g. minute paper). They help students consolidate their understanding. Reading from a textbook is generally not considered active learning, but it could be when accompanied with questions, problems, or scenarios.

At the beginning of a course, I express my expectations of the students and what they can expect from me and the course as well as provide a detailed syllabus. These serve as a course contract, which I stand by. I try to make each lecture's learning objectives clear and useful; they keep me on track and provide students a knowledge framework. I let them know why I am doing an activity, particularly if it is something they usually don't encounter in other classes. For example, the minute paper is often an uncomfortable activity for a number of students. I explain the evidence that shows that it improves student learning…and that it is a practice exam question. When I try something new I let them know why I am doing it and that I value their feedback (and I mean it).

I don't believe that we need to reduce the amount of content students are responsible for. Knowledge is the foundation from which higher-level learning and critical thinking can occur. I do believe in reducing the amount of new content a student is presented with during a lecture. This means that students should be responsible for some of their own learning outside of lecture. This can be done by pre-reading plus assessment such as a quiz for motivation, project research, etc. There are some lessons in which the content is challenging for students. For example, the Biology 343 (Plants and People) class is made up of science and arts students so the background knowledge is varied. One strategy I use is the work along handout for complicated topics such as plant structure and reproduction. Students annotate worksheets as we progress through the lecture. There is also a lab that accompanies these lectures to reinforce the learning.

Assessments should be frequent and support learning objectives. Frequent assessment not only reinforces the content throughout the term, but also helps students accumulate a body of knowledge, gain deeper understanding, and provides the opportunity for self-assessment. The teacher can gauge how well students understand course material and they can address misconceptions. Assessment restricted to midterm and end-of-term often fosters short-term learning. Self- or peer-assessment has many additional benefits including the development of critical reasoning and writing skills. Assessments of other types of activities are also important even if only worth a few marks.

The value of labs and fieldtrips cannot be over stated. They are opportunities for students to interact with course content in a different way from lecture (promote long-term learning and deeper understanding as well as addressing some of the complex issues of sustainability). These small group settings are also good for assessing a student's level of knowledge. In the first week of Biology 321, and 343 the classes go on a fieldtrip. The associated assignment helps me gauge their level of knowledge and I can address any gaps. As the term progresses fieldtrips build on course knowledge so by the end of the course students can "do science" in an authentic way through term-long projects and field studies where they collect and analyse data. They make discoveries and can even publish on the course website. Student projects are valuable learning opportunities as well as giving them an opportunity to pursue areas they find interesting and develop communication skills.

Part of our responsibilities as educators is to help students develop skills in listening, reading, communication, problem solving and critical thinking. We want our graduates to be prepared for careers or continued study. Varied course activities such as discussion, written and oral presentations as well as working through problems and concepts independently and in groups (such as project work) prepare students for postgraduate engagement. Collaborative activities provide a forum for applying what is being learned as well as sharing different perspectives. In addition, I believe creativity and authorship (publishing) encourage a student's identity as a scientist. Moreover, the refinement of observational skills is fundamental to scientific inquiry; appreciation for and understanding of organisms are generated through hands-on experience with living specimens in lecture, lab, and on fieldtrips. With varied activities students think in different contexts about concepts and thus have a better understanding (reflective learning). One of our main responsibilities as educators is to provide students the tools and skills they need to not only be good global citizens, but also to be equipped to make positive changes to our world. Sustainability education is about making students aware of

issues (and their complexity) that affect the health of the planet and humanity. It is easy to relay examples of doom and gloom that surround us, but we also need to help develop attitudes and abilities to move forward for positive change. Engagement in community projects provides students with local context and sense of place.

I take interest in my students' academic growth, often giving advice based on my experiences as a student, advisor, scientist, and educator. All of our students are capable of success, but many need guidance and motivation to reach closer to their potential. Through advising, presenting study skill workshops, and by example, I try to help students reach their goals in academics, career planning, and as good global citizens.

PHILOSOPHY OF E-LEARNING

Students today have different challenges than we faced as undergraduates. The biggest one is distraction. Between computers and cell phones, students are always engaged with technology. As teachers, the trick is to use it to our advantage. The internet is an amazing resource. We can generate web-based assignments, which get students doing their homework while surfing. From current events footage to videos and blogs we can also use the internet to liven up our lectures. I have participated in pilot projects for upgrades of course management systems as well as attended workshops on instructional technologies in attempts to keep a step ahead of students and develop the most effective uses of technology for my classes. I have experimented with different uses of the internet with blogs, wikis, Vista, Elgg, Blackboard, Elluminate, WordPress, Drupal, and Keep toolkit. The e-porfolio project sprang from the idea that students liked to develop online identities and that it would help them with their studies and careers.

Course websites can generate dynamic learning communities; students have the opportunity to interact with each other, the instructors, and the course material. In my courses they are used to supplement, not replace, what is being learned in the classroom, lab, and field. A website with images, video, lecture notes, quizzes, self-tests, assignments, sign-up sheets, chat room, and class announcements and calendars provides an anchor for course communication and content access. Self-grading quizzes can increase the frequency of student assessment without adding to instructor grading time. Discussions promote interaction, but they are also valuable practice in communication. Reminding students to write clearly when answering or asking questions is re-enforced during exchanges. Website space for student projects provides students the opportunity to "publish". Websites provide a flexible platform of course delivery; it is easy to add material on the fly and link to relevant online information. The site must be organized and easy to maneuver for both the student and instructor. When used effectively, websites can greatly enrich a course and turn the students from Facebook to bryophytes….well at least for a little while.

As a teacher I enjoy face-to-face interaction with students and use the internet as a supplement to my courses. Distance Education, however, is a global reality. The use of social media has exploded in the last few years. Students have embraced it for social interactions, but also academics. For example, in Biol 210 and 321 students have generated course-specific Facebook pages and wikis to share information and images with their classmates. Developing and teaching a full online course (for Thomson Rivers Open University) has given me a an appreciation for this form of instruction. Interactivity is accomplished through synchronous communication interfaces, dynamic discussion boards, and other technologies. Course enrolments are limited by how many students an instructor can handle. A new type of instruction has emerged in which the instructor is taken out of the system, producing a forum that is infinitely scalable. These massive open online courses (MOOCs), such as Coursera, Udacity, and edX, provide large-scale online courses developed by leading universities. There are obvious limitations to this form of instruction, but for widespread information dissemination from reputable sources this is an excellent way for serving a wide range of learners. I do not see them replacing an undergraduate experience in biology, as skill building, experiential learning activities, face-to-face collaborations, and field explorations and research cannot be simulated.

TEACHING DUTIES

I have taught a diversity of undergraduate courses in the Biology Program. My experience has been varied in terms of subject areas and year levels as well as lab/lecture and team/independent. The following is a list of courses I have taught which reflect this diversity.

BIOL 110 (lab) - Cellular and Organismal Biology

BIOL 115 (lab and lecture) - Organismal Biology

BIOL 120 (lab and lecture) - Ecology, Genetics, and Evolution

BIOL 120 (elective) - Pollination Biology

BIOL 140 (elective) - Bums Bog, Cryptic Botany

BIOL 209 (lab and lecture) - Introduction to Non-Vascular Plants

BIOL 210 (lab and lecture) - Introduction to Vascular Plants

BIOL 321 (lab and lecture) - Bryology

BIOL 324 (lab) - Seed Plant Taxonomy

BIOL 343 (lab and lecture) - Plants and People

BIOL 352 (lab) - Plant Physiology

BIOL 420 (lab and lecture) - Plant Anatomy

BIOL 448 - Self-directed Research Projects

BIOL 525 - Advanced Plant Anatomy

BOTA 505B - Botany Graduate Student Fieldtrip Course
Supervision of three class research projects that had field components: Stanley Park (http://www.botany.ubc.ca/bryophyte/stanleypark), Bryophytes of Bamfield, *Takakia* trip to Jervis Inlet and microscopic studies

EDUC 440D (Lab and Lecture) - Study in Botany (Faculty of Education, UBC)

FRST 498 – B.Sc. Thesis in Forestry

Guest Lectures at UBC:

BOTA 505B (lab and lecture) - Botany Graduate Student Fieldtrip Course

AGRO 322 (lab and lecture) - Methods in Horticulture (Faculty of Agricultural Sciences, UBC)

AGRO 490 (lecture) - Topics in Agroecology and Conservation (Faculty of Agricultural Sciences)

APBI 318 (lecture) - Applied Plant Breeding (Faculty of Land and Food Systems)

Other Institutions:

BIOL 105 (Lecture) - Environmental Biology (Capilano College)

BISC 399 (now BIOL 3431) Developed and taught on-line course – Plants and Society (Thompson Rivers Open University)

Duties as Lab Coordinator:

(I) Teaching Assistant Management and Preparation

Teaching Assistants are an integral part of undergraduate education. They are generally the ones who instruct in small, experiential class settings and serve as role models. I encourage them to share their research interests with their students. TAs often have expertise in the areas we are studying so routinely make valuable contributions to courses. My primary duty as a TA supervisor is to provide them support they need to teach their classes.

I supervise between 13 and 14 graduate student teaching assistants per year. Before the beginning of term, TAs are welcomed to the course and given a detailed schedule that outlines the hours and dates they are

required to work. Each week there is a formal prep session for that week's lab. I present them with an overview and TA Guide that point out the important concepts and any additional information. We go through the materials the students will be seeing and discuss strategies of instruction. Each TA is generally assigned two lab sections (3 hours each). In their lab sessions they give a brief introduction (lesson) and then the students begin working through the lab activities. I strongly believe that TAs should be given freedom to develop as teachers, so general layout and presentation is up to them (with guidance). During lab sessions I support TAs by answering student questions. When difficult situations arise I generally try to resolve them through direct discussion with the TA before pursuing disciplinary avenues. Thankfully these are very rare. TAs are required to attend lectures.

(II) Collection, Organization, and Presentation of Materials

Collecting plant material is an important part of lab preparation. Living material must be in good quantity and quality. Some collections need to be done at other times of the year and then stored (frozen, dried, etc). Collection sites include UBC campus, Cypress Mountain, Eagle Ridge bluffs, Stanley Park, Pacific Spirit Park, and Gulf Islands. Teaching gardens are important sources of plant material as well. I have developed and coordinated a number over the years (Totem Field, UBC Farm). This year we coordinated with Kevin Kubeck (UBC Botanical Garden) to consolidate the gardens in the Botanical Garden Nursery. Organisms from the greenhouse and culture facility must be ordered well in advance. Additional materials for labs include pictures, prepared microscope slides, and demonstrations.

(III) Student Instruction

During lab sessions, answering students' questions, assisting TAs, and making sure that everything is running smoothly are my primary roles.

(III) Student Assessment and Feedback

Lab exams are developed in the case of multi-sectioned courses with various versions *de novo* (students are permitted to keep all exams). Lab exams. In some courses a station component is accompanied by a problem (Biol 343, plants and people) or a keying activities (Biol 321, bryology). In seed plant taxonomy (Biol 324) there is a weekly quiz and no final lab exam.

Exams are graded within a week. Students must write out any issues they have with the grading and submit it. My policy is that students will not lose marks on a re-grade request. Having students revisit an exam is a significant learning opportunity. Lab exercises and assignment are also used in evaluation.

(IV) Writing and Revision of Laboratory Manuals

The lab manuals are revised every year. I have written a number of lab manuals including Biology 420 (plant anatomy) and Biology 343 (plants and people). Others I have inherited and revise every year (text and illustrations). Changes in lecture must be reflected in the lab manual; lecturers participate in lab manual upgrades.

(V) Lecture Attendance

Attending lectures of the other instructors is important to know what is being covered to ensure that lab and lecture are coordinated. Other assistance is provided upon request.

(VI) Lecturer Support

In some courses the lecturers assign lab-based projects which require coordination and supervision. For example in Biology 209 students must collect and identify an alga, a fungus, and a bryophyte. Lecturers, TAs, and myself supervise students during out-of-class lab times.

(VII) General Laboratory Management

The courses for which I am in charge are the largest users of the organismal teaching labs. I maintain microscopes (doing simple repairs, changing bulbs, etc) as well as take care of general lab upkeep. In the upcoming months I will be overseeing lab renovations.

Duties as Web Site Developer

Course web sites I am solely responsible for: Biology 209, Biology 210, Biology 321, Biology 324, and Biology 343 (summer session).

Site development includes the following:

Formatting
Imaging - taking and processing images (including images of student preparations)
Text - making text compatible with a web-based format
Interactive components - self-tests, bulletin board, videos, etc.
Keeping present with technology

For the most part the websites are designed to supplement the lab and lecture materials. All of my course websites are WebCT Vista based whereas the Biology 321 website also has a component in the public domain. The students of Biology 321 have been contributing to the site and as a group we decided that since there were very few bryological websites that ours could develop into an important resource. Over the past few years we have been participating in a number of pilots including the UBC-wide e-portfolio and Vista pilot projects.

BIOL 321 is participating in the Blackboard pilot, University of British Columbia.

Duties as Lecturer (see Teaching Philosophy)

My primary goal as a lecturer is to present material in a stimulating way, inspire students for further study, and make them more aware about how plants fit into their lives. There are many components that must be very organized: course outlines (with learning objectives, readings, etc), lecture content, hand-outs, quizzes, assignments, study questions, exams, fieldtrips, demonstrations, clicker questions, and powerpoints. Images, mostly taken by me, are selected to accompany lectures and include those taken from students' samples (with student credit). For each lecture I include an interactive component and at least one demonstration (or video). In upper level courses there is a self-directed project in which the students choose a topic in the area of study they find interesting. Research experts in the field are often invited as guest lecturers. Teaching Assistants are encouraged to present their research to the class. As a lecturer it is also part of my responsibility to know what the students are learning in the laboratory component of the course.

INFORMATION ON SPECIFIC COURSES

Biology 209 (Introduction to Non-Vascular Plants) and 210 (Introduction to Vascular Plants)

- These are survey courses in which we cover the general biology and evolution of photosynthetic organisms and fungi.

I am the lab coordinator for both of these courses. Each course has seven to eight lab sections totaling approximately 180 students. Each TA is assigned two lab sections. Biology 209 (Introduction to Nonvascular Plants) requires collecting specimens in the intertidal (algae) and the forest (fungi and bryophytes). Cultures of fungi and agar plates for culturing are ordered from our culture facility (Canadian Centre for the Culture of Microorganisms). Biology 210 (Introduction to Vascular Plants) has less of a plant collection requirement. Much of what I need is supplied through the greenhouse. Quality and quantity is crucial. In some cases the students generate the plant material themselves (e.g. culture their own fern gametophytes, grow "Fast Plants", plant sunflower seeds). The lab manual and materials (preserved and fresh organisms, prepared microscope slides, pictures, demonstrations, activities) providing the learning framework must be very organized.

Sean Graham and I share the lecture of Biology 210. I teach the first half: vascular plant morphology and photosynthesis.

I will be giving up teaching Biology 209 as my administration duties increase.

Biology 321 (Structure and Evolution of the Bryophytes)

- An introduction to the morphology, interrelationships and evolution of the mosses, liverworts, and hornworts.

Lab and lecture are complementary. There are usually between 30 and 38 students registered (I restricted enrollment to 23 this year due to my administration load). We meet for three hours twice a week. At each meeting there is a one-hour lecture followed by a two-hour lab. Evolution, taxonomy, ecology, and physiology of

bryophytes (mosses, liverworts, and hornworts) are covered in the lectures as well as provide background information to the lab. Images and demonstration materials are incorporated for preview and review. In lab, students have the opportunity to investigate the organisms and learn how to identify them. To provide material for their lab exercises, extensive collection is required. Preserved specimens and prepared slides are incorporated. In the first week of class the students are taught how to do semi-sterile techniques and culture a selection of different types of propagules. Over the course of the term these cultures are examined to demonstrate bryophyte development. Each lab period one or two cultures are presented to demonstrate features specific to that lab exercise (called the “culture du jour”). There is an SEM (Scanning Electron Microscopy) component to the course. Some students incorporated their images into their projects, others contributed to the course website. Students are required to do a project and presentation (oral or poster). They may work in groups, but each student is required to submit an individual paper. There is generally a wide range of topics. Projects include ecological studies and library research. Some students wish to pursue a study in development using tissue culture. Others collaborate with the community. Some students develop information material for the public such as called the “Bryophytes of Stanley Park” in cooperation with the Ecological Society of Stanley Park. It is presently being sold at the Nature House.) Others have done similar projects in Camosun Bog, Pacific spirit Park, UBC Botanical Garden, and Nitobe Gardens. In the latter cases the students’ presentations were class fieldtrips to these sites. Fieldtrips are an important component of Biology 321. There are three mandatory fieldtrips: Pacific Spirit Park, Camosun or Burns Bog (DND site), and Lynn Canyon with a number of optional ones throughout the term (usually sites are selected based on student interest or project topic). As part of their course requirement students submit a collection of 15 bryophytes that must be presented as voucher specimens for herbarium.

For the last two years we have been collaborating with the Camosun Bog Restoration Group .

Biology 324 (Seed Plant Taxonomy)

- This course covers such topics as primitive flowers, floral evolution, vegetative morphology, mating systems, pollination syndromes, nomenclature, variation and evolution, chromosomes, hybridization and polyploidy, chemotaxonomy, types of classifications, cladistics, and phylogeny. In the lab conifers and 24 common flowering plants families are examined. The objectives of the lab are to learn how to recognize the common plant families and to identify to species members of these families.

I have coordinated the lab component of this course for nine years. There are usually around 50 students in the with three lab sections. Most years we have three TAs for the course. The lab exercises I inherited (from Fred Ganders) are well-organized so I have not been required to make many changes other than to update taxonomy and make minor alterations. I have developed a website that from which students can access images which are aimed to help students with the laboratory content and download lecture material. Each week we examine a number of plant families.

There are initial exercises designed to familiarize the students with the main characteristics of the family followed by a selection of plants the students are to identify to species (using “Flora of the Pacific Northwest” by Hitchcock and Cronquist). This course has the most extensive collection requirement of all the courses I teach.

One of the course requirements is a plant collection. Fifteen different species are collected, pressed, identified, and properly labeled. The lecturer, TAs, and I mark these at the end of the term.

I lectured Biology 324 when Fred Ganders and the Quentin Cronk went on sabbatical (entire course in 2003w and one quarter in 2008w).

Biology 343 (Plants and People)

- In Biology 343 we explore human utilization of plants for food, materials, fuels, medicines, gene sources, and social purposes. The general biology of plants is covered from anatomy to taxonomy using examples of plants that are important to humans.

I usually teach this course only in summer session. I developed and teach both lab and lecture. This course is a particular challenge. It is four (previously three) weeks, intensive, and the students come from a diversity of backgrounds (arts, education, human kinetics, biology, chemistry, physics). There is no prerequisite, but is assigned science and lab credit for many programs (including biology). The students learn the fundamentals of

botany (plant anatomy and morphology, taxonomy, metabolism) in the context of plants that have played important roles in human history. Content changes from year to year depending on student interest. On the first day of class I hand out cards for the students to write down what they would like to learn about and expectations of the course. A few days later they must select a project topic. I use this information to develop the lectures with their interests in mind. The student projects consist of a written paper and a presentation to the entire class. There are a number of fieldtrips: Pacific Spirit Park, Botanical Garden, UBC Arboretum (student-led fieldtrip), Chinatown (including Dr. Sun Yet San Garden, Taoist temple, and markets), and UBC Museum of Anthropology. Early in the term I have a librarian from Woodward Library give the students an orientation on how to research their term paper (many of the students do not know how to do library research).

Biology 448: 26 students since 2005: 3 (2005w), 3 (2006w), 5 (2007w), 5 (2008w), 5 (2009w), 2 (2010w), 3 (2011w)

Forestry 498: 1 student, 2006w (co-supervised with Sally Aitken, Forestry)

Directed Studies Research:

Students carry out various investigations. Most include microscopic, field, or tissue culture, as my research facilities are limited. Examples include: Garry Oak Woodland Vegetation Inventory, Germination of Bryophyte Spores and Propagules, Mycorrhizae in Local Plants, Scanning Electron Microscopy of Pollen, Poaceae Investigation (project though UBC Herbarium), Fungi/Bryophyte Interactions, Survey of Stem and Root Modifications (microscopy, imaging), Nuxalk Plant Use.

Directed Studies – Peer Teaching:

Students gain experience in classroom teaching in a discipline area. In Biology 209, 210, and 321 undergraduate students have the same teaching duties as graduate TAs such as teaching lab lessons and facilitating lab activities. They do not do any marking, but are required to do a term project. This may be discipline based (develop a lab lesson) or science education.

(b) Courses Taught at UBC

Session	Course Number	Scheduled Hours	Class Size	Hours Taught			
				Lectures	Tutorials	Labs	Other
11W	BIOL 210	9/week	125	21		96	1- fieldtrip
11W	BIOL 321	6/week	22	22		35	14-fieldtrips
11W	BIOL 209	9/week	92			135	2 - fieldtrips
11W	BIOL 324	6/week	42	10		66	2-fieldtrips
10W	BIOL 209	8 hours	146			Bryophyte Collections	
10W	BIOL 324	6/week	31	10		66	2-fieldtrips
10W	BIOL 210	9/week	120	21		96	1- fieldtrip
10W	BIOL 321	6/week	28	22		35	14-fieldtrips
10S	BIOL 343	15/week	20	22		24	8-fieldtrips
09W	BIOL 209	9/week	152			135	2 - fieldtrips
09W	BIOL 324	6/week	40	10		66	2-fieldtrips
09W	BIOL 210	9/week	149	21		96	1- fieldtrip
09W	BIOL 321	6/week	37	22		35	14-fieldtrips
09W	BIOL 140	6/week	18	4		4	1- fieldtrip
09S	BIOL 343	15/week	27	22		24	8-fieldtrips
08W	BOTA 505B	8 hours	9	1		8	Assistance with course project
08W	BIOL 209	9/week	159			135	2 - fieldtrips
08W	BIOL 324	6/week	45			66	2-fieldtrips
08W	BIOL 210	9/week	145			96	1- fieldtrip

08W	BIOL 321	6/week	28	22		35	14-fieldtrips
08W	BIOL 140	6/week	14	4		4	1- fieldtrip
08S	BIOL 343	15/week	22	22		24	8-fieldtrips
07W	BOTA 505B	8 hours	9	1		8	Assistance with course project
07W	BIOL 209	9/week	171			135	2 - fieldtrips
07W	BIOL 343	6/week	28	22		24	4-fieldtrips
07W	BIOL 324	6/week	40			66	2-fieldtrips
07W	BIOL 210	9/week	167			96	1- fieldtrip
07W	BIOL 321	6/week	35	22		35	14-fieldtrips
07W	BIOL 140	6/week	12	4		4	1- fieldtrip
07S	BIOL 343	15/week	27	22		24	8-fieldtrips
06W	BOTA 505B	TBA	9	1		10	Assistance with course project
06W	BIOL 209	9/week	191			135	2 - fieldtrips
06W	BIOL 324	6/week	42			66	
06W	BIOL 210	9/week	156			96	
06W	BIOL 321	6/week	31	22		34	14-fieldtrips
06W	BIOL 140	6/week	12			6	2- fieldtrips
07S	BIOL 343	15/week	27	22		24	8-fieldtrips
05W	BOTA 505B	8 hours	9	1		10	Assistance with course project
05W	BIOL 209	9/week	191			135	2 - fieldtrips
05W	BIOL 324	6/week	46			66	
05W	BIOL 210	9/week	171			96	
05W	BIOL 321	6/week	31	22		34	14-fieldtrips
05W	BIOL 140	6/week	12			6	2- fieldtrips
05S	BIOL 343	15/week	17	30		8	10-fieldtrips
04W	BIOL 209	9/week	202			135	
04W	BIOL 324	6/week	41			66	
04W	BIOL 210	9/week	179			96	
04W	BIOL 321	6/week	38	22		34	13-fieldtrips
04S	BIOL 343	15/week	13	30			10-fieldtrips
03W	BIOL 209	9/week	171	13		135	3-fieldtrips
03W	BIOL 324	6/week	39	33		33	
03W	BIOL 210	9/week	178	9		96	12-fieldtrips
03W	BIOL 321	6/week	29	22		34	18-fieldtrips
03S	BIOL 343	15/week	24	30			15-fieldtrips
02W	BIOL 209	9/week	165			135	~30-project 3-fieldtrips
02W	BIOL 324	6/week	41			66	
02W	BIOL 210	9/week	144			96	12-fieldtrips
02W	BIOL 525	3/week	5	10		96	12-fieldtrips
02W	BIOL 321	6/week	32	22		34	18-fieldtrips
02S	BIOL 343	15/week	20	30			15-fieldtrips
01W	BIOL 209	9/week	115			108	~30-project
01W	BIOL 324	6/week	47			66	
01W	AGR0 322	6/week	120	3		3	
01W	BIOL 210	9/week	129			96	12-fieldtrips
01W	BIOL 321	6/week	20	21		34	18-fieldtrips

01S	BIOL 343	15/week	33	26		30	15-fieldtrips
00W	BIOL 209	9/week	94			70	Note: job-sharing (65% of course)
00W	BIOL 324	6/week	59			66	
00W	BIOL 343	9/week	43			54	15-fieldtrips
00W	BIOL 210	9/week	109			96	12-fieldtrips
00W	BIOL 321	6/week	26			34	18-fieldtrips
00W	AGR0 322	6/week	15	3		3	
00S	BIOL 343	15/week	30	30			
99W	BIOL 209	9/week	102			108	
99W	EDUC 440D	6/week	21	Integrated Lab/Lecture - 21			6-fieldtrips
99W	BIOL 210	9/week	100			96	9-fieldtrips
99W	BIOL 120 (elective)	6/week	20			24	6-fieldtrips
99S	BIOL 343	15/week	25	30		30	15-fieldtrips
98W	BIOL 115	3/week	139	32			
98W	BIOL 210	9/week	85			96	12-fieldtrips
98S	BIOL 210	15/week	5	30		30	6-fieldtrips
98S	BIOL 343	15/week	26	30		30	
97W	BIOL 209	3/week	141	9		108	
97W	BIOL 115	3/week	97	32			
97W	BIOL 110/115	12/week	300	32		120	
97W	BIOL 120	3/week	150				
97W	BIOL 210	9/week	126	32		96	
96W	BIOL 420	6/week	8			27	
96W	BIOL 210	9/week	99	32		96	
96W	BIOL 321	6/week	32			34	
95W	BIOL 209	9/week	111	25		70	
95W	BIOL 210	9/week	92			96	
95W	BIOL 420	6/week	6	32		27	
94W	BIOL 352	12/week	85		9	120	

*OFFICE HOURS ARE NOT INCLUDED
*TA-ships as a graduate student have not been included

(c) Graduate Student Supervision

As the lab and course coordinator for the following courses I am responsible for the direct supervision of 13 to 14 graduate student TAs per year.

BIOL 209 (lab and lecture) - Introduction to Non-Vascular Plants, 4 Teaching Assistants

BIOL 210 (lab and lecture) - Introduction to Vascular Plants, 4 to 5 Teaching Assistants

BIOL 321 (lab and lecture) - Bryology, 2 Teaching Assistants

BIOL 324 (lab) - Seed Plant Taxonomy, 2 Teaching Assistants

BIOL 343 (lab and lecture) - Plants and People, 1 Teaching Assistant

BOTA 505A – Botany Graduate Student Fieldtrip Course, Botany Department, UBC
Supervision of three class research projects:

Stanley Park – 2005w (http://www.botany.ubc.ca/bryophyte/stanleypark)
Bryophytes of Bamfield – 2006w
Takakia: trip to Jervis Inlet, microscopic studies - 2008w

(d) Continuing Education Activities

Thompson Rivers Open University:
Online Course Development: BISC 399 (now BIOL 3431) (2006)
Online Teaching: BISC 399/BIOL 3431 (2007 – 2011)

Professional Development Workshops

- A Dip in the Pool: Connect Basics, Centre for Teaching, Learning, and Technology (CTLT) – May. 2012
- A UBC Wiki All-star Session, Centre for Teaching, Learning, and Technology (CTLT) – May. 2012
- Clicker Workshop, Carl Wieman Science Education Initiative (Science Teaching and Learning Fellows) – May. 2012
- One Hour Portfolio, Centre for Teaching, Learning, and Technology (CTLT), University of British Columbia, (Oct. 2011)
- Developing your Skills as Reviewer: Introductory Workshop, Peer Review of Teaching Community of Practice (CoP) Events, University of British Columbia, (Sept 2011)
- Faculty of Science Supper Series: Communicating Science: SCIE300 - Faculty of Science September, University of British Columbia, (Sept, 2011)
- Teaching and Learning: 3 Things You Might Want To Know, University of British Columbia (Sept 2011)
- QPR (Question, Persuade and Refer) Suicide Prevention – Faculty of Science, University of British Columbia (Sept 2011)
- Drupal Workshop, University of British Columbia, (June 2011)
- Peer Review of Teaching - Monthly Community of Practice Event, University of British Columbia, (May, 2011)
- Teaching with Technology: Wikis, WordPress & More - Hands On, University of British Columbia, (May 2011)
- Faculty of Science Supper Series: Piloting the new First Year Seminar in Science, SCIE113 - Faculty of Science, University of British Columbia, (March 2011)
- Managing your Scholarship: Mendeley, Refworks or Zotero – Celebrate Learning Event, University of British Columbia, (Oct, 2010)
- WordPress Training Session – Centre of Teaching, Learning, and Technology (CTLT), University of British Columbia (March 2011)
- Faculty of Science Supper Series: Addressing diversity and privilege in the Science classroom, University of British Columbia, (Nov. 2010)
- Emerging Technologies: Learn. Connect. Share, Teaching and Academic Growth (TAG) Institute, University of British Columbia, (May 2009)
- Electronic Assignment and Feedback: Providing quick and effective feedback, Teaching and Academic Growth (TAG), University of British Columbia, (May 2009)
- Elluminate workshop (online teaching and learning tool) – Thompson Rivers University, Kamloops, B.C. (April 2009)
- Creating Multimedia Objects, Canadian e-Learning Conference Program, University of British Columbia, (June 2009)
- Digital Photography and the Web, Teaching and Academic Growth (TAG), University of British Columbia, (May, 2010)
- Argumentation in the Discipline: Teaching discipline based critical thinking, Teaching and Academic Growth (TAG), University of British Columbia, (May 2009)
- Self-Assessment of Your Teaching: Things to think about, Teaching and Academic Growth (TAG), University of British Columbia, (Sept. 2010)
- Working with Assessment and the Quiz Tool in WebCT / Using Respondus, Teaching and Academic

Growth (TAG), University of British Columbia, (Sept. 2009)
- Digital Tools for Feedback and Assessment, Teaching and Academic Growth (TAG), University of British Columbia, (June, 2006)
- Reading, Re-mixing and Republishing RSS, Teaching and Academic Growth (TAG), University of British Columbia, (June 2006)
- Weblogs and Wikis, Teaching and Academic Growth (TAG), University of British Columbia, (June 2006)
- Weblogs and Wikis, Centre for Teaching and Academic Growth (TAG), University of British Columbia, (May 2005)
- Enlivening your Course with RRS (Rich Site summary), Teaching and Academic Growth (TAG), University of British Columbia, (May 2005)
- Putting Electronic Teaching Portfolios into Practice, Putting Electronic Teaching Portfolios into Practice, University of British Columbia, (June 2006)
- Working with Assessment and the Quiz Tool in WebCT using Respondus, Teaching and Academic Growth (TAG), University of British Columbia, (June, 2006)
- Digital Tools for Feedback and Assessment - Teaching and Academic Growth (TAG), University of British Columbia, (Feb 2006, May 2007)
- Reading, Re-mixing and Republishing RSS - Teaching and Academic Growth (TAG), University of British Columbia, (June 2006)
- Database Driven Websites using Dreamweaver, University of British Columbia, (May 2005)
- Developing Online Timelines, University of British Columbia, (May 2005)
- E-Learning Tools, e-Learning Institute, University of British Columbia, (June 2005)

9. SCHOLARLY AND PROFESSIONAL ACTIVITIES

(a) Areas of special interest and accomplishments

Pedagogical Interests

My current research in teaching and learning has primarily to do with enhancing online student learning and to facilitate deep conceptual understanding and information retention. The project morphed into an examination on independent identity vs. group collaboration and the use of information processing activities to promote reflective learning. Joanne Nakonechny (Skylight) and I examined group and individual workspaces in the Biology 321 (bryology) course e-portfolio as a structure through which students learn about mosses, liverworts, and hornworts. The course e-portfolio, as with the more generic portfolio, became a place where students could reflect upon the many different components within the field of bryology and, more generically, of science. Although the course e-portfolio does not cast as wide a net for reflection and integration as does the traditional e-portfolio, it does provide students with the practice of critical reflection for deep structure learning and practice in integrating component parts of discipline knowledge within science.

"Bryofolio" use resulted in more engaged students who better supported each other's learning and were more capable of discussing discipline knowledge and approaches to scientific research. As well, this deeper understanding of bryophytes and the peer learning facilitated through the course portfolio, lead to more scholarly communications about bryophytes to a wider audience through the public course website and the Camosun Bog Restoration Group interactions. One of the main outcomes of this project was that students not only preferred, but processed information much more deeply when they worked in groups than they did as individuals. We provided students with two ways of submitting reflective activities, individually and in groups. In the second year we let them decide in which format to present. Not one student elected to do the work independently. Along with these activities we developed an information processing sheet (IPS). It was originally called the reflection page, but the students found the word reflection distasteful so the exercise was given an alternate name. We wanted to provide a model for students on how to think about the subject and, more generically, about any subject material they might encounter in subsequent courses. Given student concerns about time constraints, we also wanted to provide students with a set of study sheets (tools) that would aid them in learning the material for their exams. Students responded in a variety of ways to these activities. Almost all students saw value in completing them, but some expressed frustration with various questions and the time they took to complete. A number of students realized that the IPS could change the way they approached the subject material and how it was more

efficient for retention to start transforming and integrating the new course material as soon as possible after a lesson.

Bryofolios: Individual and Group E-portfolio Learning Spaces for Developing Authentic Science Scholars. In D. Cambridge (Ed.), Hershey PA: *Global Diffusion of E-Portfolios*: IGI Global Publications, co-published with Joanne Nakonechny

Botanical Interests

My interests in biology are varied, but fundamentally I find everything about plants and their structure fascinating. During my graduate research I studied phytochemistry and developed tissue culture protocols and chemical extraction and identification procedures, but I found the most fascinating part was the structural aspects of plants. How, where, and why are secondary metabolites stored? My interests shifted to plant anatomy and chemical ecology. I was able to incorporate these interests into my thesis work.

The plants I have been most enamored with since graduate school are the bryophytes (mosses, liverworts, and hornworts). They are often overlooked, yet so different from the other land plants. My interest was sparked as an undergraduate in bryology class with Dr. Wilf Schofield. We remained friends and for many years neighbours in the Botany Department. When he retired I was asked to take over his course. He continued to mentor me about this very diverse group of organisms and participate in course activities (guest lecturing and visiting the labs). We went on many collecting expeditions including Haida Gwaii. Dr. Schofield was an active researcher and colleague until his death in November 2008. Bryology remains one of my main interests; it is an exciting area of study. In recent years advances in molecular biology have resulted in a taxonomic upheaval and shifts in understanding evolutionary relationships. Increased interest in biodiversity and their role in ecosystems have also brought them under the spotlight.

I have received praise for the Biology 321 (bryology) public website with numerous requests to use images from the site. Students made the decision to have a separate public site that presented images as they wanted to “share bryophytes with the world”. Content includes images of habitat, habit, light microscopy and scanning electron microscopy with emphasis on organisms used in lab and field activities. Dr. Janice Glime (Michigan Technical University) has incorporated images from the public website into her ebook, *Bryophyte Ecology* (see section on ‘Non-Refereed Publications’, page 28). The Biology 321 public website has become outdated and has very limited interactivity so we are currently moving it to a wordpress platform with components, such as an interactive *Sphagnum* key, housed on the Botany server. Wordpress will make it easier for students to participate in the development of content and post projects. Skylight (Science Centre for Learning and Teaching) funding has made it possible to get assistance with the restructuring of the website. Part of the funding is to provide the student experience in confocal microscopy to generate additional images for the site.

I have been involved in a number of collaborations and research projects over the years mostly as a consultant for plant identifications, collections, and images. I provided pictures for the Ministry of the Environment (British Columbia) on endangered species (*Scouleria marginata* and *Fabronia pusilla*). Another rare bryophyte, *Takakia,* has been of particular interest; it is comprised of two species that until relatively recently was classified as a liverwort. While obviously basal on the moss phylogenetic tree its relationship with the rest of the bryophytes has remained elusive. This sparked the interest of graduate students in the botany department and they asked me to supervise their BOTA 505B sequencing project on *Takakia lepidozioides*. I organized an excursion for collection, as it is known from only one local site (a waterfall at the end of Jervis Inlet). *T. lepidozioides* has been said to be the most disjunctive moss in the world (Ben Tan) found in only a few sites in British Columbia, Nepal, Himalayas, Borneo, and Japan. My interest in *Takakia* and my reputation for success in bryophyte tissue culture prompted research groups to request samples and site visits. I coordinated another collection expedition to Jervis Inlet in May 2010 for Jeff Palmer’s lab (Indiana University). We also collected for Sean Graham’s lab (University of British Columbia) and Brent Mishler’s lab (University of California Berkeley) and made collections for the Biology 321 class. Additional bryophyte samples were collected and identified for the Palmer lab.

Dr. Schofield and I received spores of *Takakia ceratophylla* to see if we could get them to germinate in tissue culture. While we were satisfied with the protocols used, no germination was observed. To date there has been no successful spore germinating in culture of *Takakia.*

Bog ecosystems are another of my interest areas. As a member of the Stanley Park Ecological Society and Beaver Lake Environmental Enhancement Project member in the 1990s I coordinated the vegetation surveys of the two peatlands in Beaver Lake at Stanley Park. A report was subsequently written (1997), but it wasn’t until last year that efforts commenced to address the shrinking of Beaver Lake and the risk to the peatlands. A restoration project is now underway and the Biol 321 class is collecting baseline vegetation data to follow the restoration process year to year. We also have an ongoing project in Camosun Bog in collaboration with the Camosun Bog Restoration Group. Development of a ‘Key to *Sphagnum* species of Greater Vancouver’ will be instrumental in monitoring the bog restoration projects. The key will include macro- and microscopic features of

Sphagnum as well as habitat pictures. It has been under development for the past two years and it will be ready for launching this May (2012).

Over the past 10 years I have collaborated with Harold Kasinksy (Zoology, University of British Columbia) and Juan Ausio (University of Victoria, Biochemistry). Their research on sperm histone diversity turned to plants including *Chara* (green alga), *Marchantia polymorpha* (thalloid liverwort), and *Plagiomnium insigne* (moss). While I have not been involved in the analytical work I was responsible for developing protocols to retrieve sperm from different bryophyte species. Degradation and sample purity were important for this research.

I am involved in 1KP (sequencing one thousand plants transcriptomes) organized through a multidisciplinary international consortium. The major supporters include Alberta's Department of Advanced Education and Technology (AET), Silicon Valley based Musea Ventures, Beijing Genomics Institute in Shenzhen, University of Alberta, and Alberta's Informatics Circle of Research Excellence (iCORE). I am working with Sean Graham, Botany Department, UBC. Dr. Graham is working on gaining data from sporophytic and gametophytic material of seedless vascular plants. Gametophytes are cryptic in this group so tissue culturing is the best method of attaining an appropriate quantity of material. I collected spores from ferns and coordinated their culture as a class project in BIOL 210.

Sustainability in Education
As a botanist/biologist I am interested in the

(b) **Grants and Funds:**

- **2012 – Skylight Grant** (Science Centre for Learning and Teaching) – "Website Development for Pathways in Biology" ($3,500 + matching funds from department)
  - Funds will be used to develop interactive website components that guide students in terms of course selection, topic focus, and activities both inside and external to science to enrich their undergraduate experience including the new concentration in sustainability.

- **2012 – TLEF** (Teaching and Learning Enhancement Fund) – "Sustainability Pathway: Phase I: Biology." ($40,000.00)
  - For development of a sustainability concentration in Biology which can be used as a model for other UBC units.

- **2011 – Skylight Grant** (Science Centre for Learning and Teaching) – "Sharing Bryophytes: updating the Biology 321 Public Website." ($4,000 + matching funds from department)
  - This grant is being used to upgrade the Biology 321 public website and develop images (including confocal) for the Biology 321 website. Funds were spent on an undergraduate assistant as well as time on equipment from the BioImaging Facility at UBC.

- **2010 – Skylight Grant** (Science Centre for Learning and Teaching) – "Video Lessons and Tutorials for Biology Courses." ($4,000)
  - Two undergraduate assistants and I developed videos to help undergraduate students in botany courses understand difficult concepts. The videos were done as claymations, time lapse, video recording, and cartooning. Camtasia was used to make the videos.

- **2010 - TLEF** (Teaching and Learning Enhancement Fund) – "Communicating Science: development of online resource and interactive learning centre for a new course in the General Science Program." ($61,896.00)
  - I applied for funding for curriculum development of a new required course in the Combine Major in Science Program. Funds were used to hire a course coordinator as well as undergraduate assistants.

- **2008 – Faculty of Science Outreach Grant** ($3,300) – Contrasting Landscapes
  - Development of elementary school program where students investigate agricultural and forest landscapes at UBC Farm.

- **2007 – Hewlett Packard Education Award** ($80,000 in computers and support) – to develop "Classroom in the Field".
  - Students use tablet PCs to collect data and access computer resources on fieldtrips.

- **2004 - TLEF** (Teaching and Learning Enhancement Fund) (Co-applicant, Tim Michel principle**)** – "Teaching Awareness: Creating Science Learning Objects for First Nations Students."

- **1998 – TLEF** (Teaching and Learning Enhancement Fund) (Co-applicant, Brian Ellis principle) Grant to develop images for lecturers in a number of courses

- **1997 – TLEF** (Teaching and Learning Enhancement Fund) (Co-applicant, Brian Ellis principle) Grant application was initially to develop course material online

Application for Teaching Lab Improvement Fund

Application for funds to renovate teaching labs successful in 2010. Renovations planned for summer 2012.

Funding from:
TLIC (Teaching Lab Improvement Committee) - $100,000
Botany Department - $100,000
Deans Office - $322,000
Total - $522,000

Academic Equipment Fund

Application for funding was successful in 2001 and we now have equipment for video presentation and web site development ($13,642). This has benefited laboratory teaching and website instruction.

(d) Invited Presentations

- **Travels with a Botanist** (For Alumni of Science 101 Program), University of British Columbia, B.C.: March, 2012

- **E-Portfolios: Digital Identity and Professional Development** (Portfolio Community in Practice), University of British Columbia, B.C.: November 15, 2011

- **Finding Your Path: Follow the Yellow Brick Road** - Aboriginal Student Presentation, First Nations House of Learning, University of British Columbia, B.C.: October 26, 2011

- **Sustainability Pathways in Biology: Looking at some Possibilities** (UBC Botany Department Seminar Series), University of British Columbia, B.C. October 4, 2011
  presenters: Shona Ellis and Gary Bradfield

- **Botany Basics, Woody Herbs, and Medicinal Plants** (UBC Farm Practicum in Sustainable Agriculture), University of British Columbia, B.C.: July 28, 2011

- **Alumnus Panel on Research at MURC** (Multidisciplinary Undergraduate Research Conference) University of British Columbia, B.C.: March 19, 2011

- **Indigo: Dye Workshop** (Applied Science 263 - Technology and Development), University of British Columbia, B.C.: February 14, 2011

* **Native Shrubs and Trees** (one-day field trips for Columbia College, Vancouver B.C.), Stanley Park, Vancouver, B.C.: July 2010, 2009, 2008, 2007

* **Sustainability on Campus:** Fieldtrip for the Sustainability Education Intensive (TAG), University of British Columbia, Vancouver, B.C., June 1, 2010, June 2, 2009

- **E-Portfolios and "Folio thinking" in Biology 321** (Portfolio Community in Practice), University of British Columbia, B.C., March 18, 2010

- **E-Portfolios and Learning** (Portfolio Community in Practice Panel), University of British Columbia, B.C., October 27, 2009

- **Understandings of Nature:** Fieldtrip for HIST 104, University of British Columbia, B.C.: September 18, 2009

- **A Day in the Year of Fibre:** presentation, fieldtrip, and lab activities (Shad Valley, Canadian summer enrichment program for high school students). University of British Columbia, B.C. July 7, 2009

- **A Look at Mosses and Their Kin** Nature Vancouver, Vancouver, British Columbia, September 18, 2008
  presenters: Shona Ellis and Wilf Schofield (Wilf was too ill to attend)

- **What WebCT Vista Can Do for You: an Overview** Learning Technology Institute (LTI) Presentation (UBC) –:University of British Columbia, B.C., August 21, 2007)
  presenters: kele fleming, Emily Renoe and Shona Ellis

- **Moving' On Up-grade: 3 Tales of the new WebCT Vista** (7th Annual UBC e-Strategy Town Hall), *presenters:* Shona Ellis (Botany), Michelle Lamberson (Geology, OLT), Michael Lee (Medicine), University of British Columbia, B.C. June 21, 2007

- **Vista Course Demos** (Centre for Teaching, Learning, and Technology/e-Learning Institute), University of British Columbia, B.C., May 28, 2007
  presenters: Shona Ellis, Cindy Underhill, kele fleming, & Emily Renoe

- **Biology 321 – WebCT Vista Site**, JEA (January Early Adopters) Lunch presentation, University of British Columbia, B.C., February 21, 2007

- **Community Building and Student Engagement: A Multidisciplinary Panel**, TLT (Teaching and Learning with Technology) Speaker Series, University of British Columbia, B.C, November 21, 2006, presenters: Shona Ellis, Jim Berger & Judy Brown

- **"Bryo-Portfolio"** for e-Portfolio Community in Practice, University of British Columbia, B.C, November 30, 2005, presenters: Shona Ellis, Bjorn Thomson, Alison Wong

- **Garden Latin Demystified** - for Adult Education Program, VanDusen Garden, Vancouver, B.C., September 25, 2005

- **The Soggy Bottom Bryos** - for the Master Gardeners Annual General Meeting, Burnaby, B.C. Theme: Water, April 10, 2005

- **Plant Taxonomy Workshop** for the Master Gardener Program (VanDusen Garden), October 22, 2004

- **Bryophytes of the Lower Mainland** - Two–day workshop for the Native Plant Society of B.C. on Bryophytes, Vancouver, B.C., October 16 – 17, 2004
  presenters: Shona Ellis and Wilf Schofield

- **Elves of the Woods** – Presentation for Friends of the Garden (UBC Botanical Garden FOGS), Vancouver, B.C. May 24, 2004

- **Basics about Bryophytes** – UBC Botanical Garden Seminar Series, Vancouver, B.C. May 10, 2004
  presenters: Shona Ellis and Wilf Schofield

- **An Introduction to Mosses and Liverworts** - Workshop and field activities – for the Native Plant Society of B.C. on Bryophytes, Vancouver, B.C. May 17 - 19, 2002

- **Ferns to Know and Grow** - Workshop on fern biology and propagation – given at the Native Plant Sale, UBC Botanical Garden, Vancouver, B.C., April 7, 2002

(e) Other Presentations

Annual Meeting of: Canadian Botanical Association/L'Association Botanique du Canada, American Fern Society, American Society of Plant Taxonomists and the Botanical Society of America – Shona Ellis and Daniel Mosquin "Asian Gardens of Vancouver" (July 2008)

(g) Conference Presentations

Ellis, S., Costrut, I., Bradfield, G., Grimm, K., and K Hunter 2012"Building a Sustainability Pathway in Biology" poster presented at AASHE (Association for the Advancement of Sustainability in Higher Education), Los Angeles, California, Oct 14, 2012.

Ellis, S. (Invited) 2012 Integrating Sustainability into a Biology Program: a work in progress, Conference of Canadian Society of Plant Biologists, University of Alberta, Edmonton, June 17, 2012

Ellis, S. and J. Nakonechny 2009 Improving University Teaching, Burnaby, *Round Table*: Tracking Hornworts, Liverworts, Mosses and More with Tablet Computers with Shona Ellis, Simon Fraser University, Burnaby, B.C. July 17, 2009

Ellis, S. and J. Nakonechny 2009 Poster: Expanding, Implementing: Multiple Science Projects and the HP Tablets. Presented at the 2009 Hewlett Packard/ ISTE (International Society for Teaching and Technology) conference on Teaching, Learning, and Technology in Higher Education, San Diego, California. February 23, 2009

Ellis, S. and D. Mosquin "Asian Gardens of Vancouver" Annual Meeting of: Canadian Botanical Association/L'Association Botanique du Canada, American Fern Society, American Society of Plant Taxonomists and the Botanical Society of America, Vancouver, B.C., July 26, 2008

Ellis, S. and J. Nakonechny 2006 "Researching Student Learning about Bryophytes Using a Folio Thinking Approach", International Conference on Scholarship of Teaching and Learning, Washington D.C., November 10, 2006

Thomson, B., **Ellis, S**., and J. Nakonechny 2006 "e-Portfolios for Reflection: Engaging Students In Connecting Learning and Practice", UBC Learning Conference, May 11, 2006.

Ellis, S., Nakonechny, J., Gagnon, F., and B. Thomson 2005 Bryo-e-portfolios (Mosses, Hornworts and Liverworts) = Student Engagement, International Society for the Scholarship of Teaching and Learning, Vancouver, October 15, 2005.

Ellis, S, Joanne Nakonechny, Bjorn Thomson, France Gagnon 2005 "The Roving Class Gathers Much Moss: the Science Bryo-e-Portfolio" poster presented at UBC e-Strategy Town Hall, June 23, 2005.

Ellis, S Joanne Nakonechny, Bjorn Thomson, France Gagnon 2005 "Bryo-Portfolio" poster presented at UBC's e-Strategy: Open House and e-Learning Salon, March 2, 2005.

Ellis, S. M. 1992 Dithiacyclohexadiene polyynes from root and root cultures of *Ambrosia chamissonnis*. Second Joint Meeting of the Phytochemical Societies of Europe/North America, Miami Beach, Florida. August 10, 1992

Ellis, S. M. and G.H.N. Towers, G. H. N.1992 Secondary Metabolism in Plant Cultures Transformed with *Agrobacterium tumefaciens* and *A. rhizogenes*. 203rd National Meeting of the American Chemical Society San Francisco, California. April 9, 1992

Recent Conference Attendance:

AAAS (Advancing Science Serving Society): Flattening the World: Building a Global Knowledge Society
February 16 – 20, 2012, Vancouver B.C

EDULEARN11 the 3rd annual International Conference on Education and New Learning Technologies
July 4 – 6, 2011, Barcelona (Spain)

10. SERVICE TO THE UNIVERSITY

My introduction to advising and student service was as a Senior Faculty Advisor in the Dean of Science Office (1996 – 2002). Much of it was straightforward academic advising, but it was helping students find solutions to challenges that was the most rewarding. In 1998 I split my time between being an Academic Advisor (M&P) and a sessional lecturer. While I really liked both jobs, I decided to pursue the teaching path, and continued advising (volunteer) with the Faculty of Science Office until 2004. I have been an advisor in Biology since 2000 and advised for Integrated Sciences between 2003 and 2005.

I was aware of struggles many General Science (GS) students experience. It was often difficult to get their choice of courses and many students ended up with an unfocused degree. This was compounded by the restrictions in program enrolments that meant that General Science ballooned with students who had other aspirations, but not the requisite grades. When I was asked in 2008 to be the director for the program I enthusiastically accepted. In addition to regular office hours, I developed advising online resources that were organized by topic and prerequisite as well as a program worksheet. I organized a number of Information Sessions so students could make the most of their undergraduate education by informing them about academic opportunities and career preparation.

The Faculty of Science was awarded Strategic Project Funding (SPF). Among the recipients were General Science and Biology. Resources were available for restructuring both programs. As chair of the GS Curriculum committee I (with the help of Ian Cavers) assembled a team to address the problems with General Science. Curriculum reform included identifying courses in the Faculty of Science that would fulfill our newly developed program-level learning objectives and generate new courses with experiential learning and communication focus. The specialization was so different from GS that we decided to generate a new specialization and Combined Major in Science (CMS) was born.

I wore two director hats (GS and CMS) and the trick was to begin implementation of the new program (CMS) while supporting GS. Chemistry, Earth and Ocean Science, and Biology each received funds to hire instructors for new CMS courses. SCIE 300 (Communicating in Science) was a course unlike any other in the Faculty of Science (except for SCIE 113 which had just finished being developed) and I recognized that we needed a course coordinator. I applied for and received a TLEF. Most of the award went to hiring Eric Jandcui (science journalist) with additional funds coming from the Faculty of Science. We could also hire an undergraduate. Two fulltime instructor hires were allotted from the SPF for SCIE 300 and departments were asked to submit proposals. A course development team was established with members from the participating departments: Eric Jandcui, Andrew Trites (Biology), Bruce Dunham (Statistics), Jennifer Love (Chemistry), Robin Stoodley (Chemistry) and myself. Additional responsibilities as Director of CMS included overseeing funding allocation and progress of the development of new lab courses, coordinating course and program-level curriculum changes for the calendar and advising CMS and GS students.

Concurrently, curriculum changes were underway in Biology. Initially I sat on the Biology Curriculum Workgroup Committee as the Director of General Science and Combined Majors in Science. I took on a more active role as I had more experience than most committee members with undergraduate programs. Trish Schulte was instrumental in getting the new Biology Specialization finalized. She went on sabbatical the summer of 2010

and I assumed the Chair of the Curriculum Working Group. Many issues still needed to be resolved with the new program including curriculum change approvals, course development, and student notification. We also needed to begin course/program curriculum development. I developed a proposal for Carl Wieman was developed and approved. To kick-start the initiative I organized a Botany Retreat in August (2011) that also included a number of presentations on other teaching and learning initiatives.

I was appointed Associate Head of Biology on July 1st 2011. So far, my duties have included: applying for CWSEI funding (mentioned in previous paragraph), coordinating CWSEI STLF (Science Teaching and Learning Fellow) hires, biology working group assembly for fundamentals course development, course planning and scheduling (a little challenging this year due the old and new program running concurrently), restructuring the Biology program website, grad checks, exchange decisions, meeting with instructors and sessional lecturers to discuss teaching related issues, and working with the Heads of Botany and Zoology to determine teaching assignments. We are currently working on teaching loads and a four-year teaching plan. I chair the newly formed SIB Committee (Sustainability in Biology. Gary Bradfield (former Sustainability Fellow) and I are planning a sustainability pathway in the Biology specialization. As part of the process I have developed a "Developing a Sustainability Pathway in Biology" WordPress website (http://blogs.ubc.ca/sustbiol), to demonstrate our progress in the process.

I developed the current biology program website (www.biology.ubc.ca) which is considered "lite" as we are planning on having an advising component that helps students pursue their areas of interest. I am also committed to providing students the opportunity to pursue their interests in sustainability, I was successful in acquiring a TLEF (Teaching and Learning Enhancement Fund) with which to develop a pathway in Sustainability within Biology. First year sustainability courses are currently being offered that will serve as a foundation. Through collaboration with other units on campus a pathway will be developed that addresses the three pillars as well as the attributes of sustainability. A major part of the project will be to develop a capstone course. The title of the TLEF "Sustainability Pathway: Phase I: Biology" reflects our intention to generate a program that can serve as a model for other disciplines at UBC and maybe beyond.

Administrative Positions (University of British Columbia, Vancouver, B.C.):

- Associate Head of Biology (July 2011 – present)
- Director of General Science (Feb. 2008 – July 2011)
- Director of Combine Major in Science (Feb. 2010 – July 2011)

Curriculum and Awards Committees (University of British Columbia, Vancouver, B.C.):

- Biology Curriculum Workgroup: 2009 - present
  Chair: July 2010 – Sept 2011
- General Science/Combined Major in Science Curriculum Committee **Chair:** June 2008 – 2011
- Killam Teaching Award Committee **Chair**: Sept. 2005 – April 2009
  Committee Member: Sept. 2001 – April 2003, Sept. 2005 – April 2009
- Killam Graduate Teaching Assistant Teaching Award Committee **Chair**: April 2006 – April 2009
  Committee member: April 2003 – April 2009
- Biology TA Teaching Award Committee: 2011
  This new award was initiated and developed by Greg Bole
- Broad Base Admissions Committee (March 2007, 2008, 2009) – first year admissions based on using a range of criteria beyond grades and standardized test

Hiring Committees (University of British Columbia, Vancouver, B.C.):

- Biology Hiring Committee (Instructor Hires, Strategic Priorities Fund, UBC) for 4 positions: 2009
- Biology Hiring Committee (Instructor Hire, Strategic Priorities Fund, UBC) for 1 positions: 2010
- Science Teaching and Learning Fellow (Postdoc STLF) Hiring Committee – Carl Wieman Science Education Initiative, for 5 positions, **Chair:** July 2011 – Oct. 2011

Sustainability Committees (University of British Columbia, Vancouver, B.C.):

- Sustainability in Biology Committee (Departments of Botany and Zoology), this newly formed committee will develop a path of study for students in Biology who are interested in focusing on sustainability **Chair:** Sept 2011 – present
- Botany Composting Committee (April 2007 - present)

Living Collections, UBC Farm, and UBC Botanical Garden (University of British Columbia, B.C.):

- Hiring Committee for Horticulturist hires: June 2008, May 2000, May, 2012
- Botany Department: Living Collections Committee, **Chair** (Sept. 1999 – present)
- Botany Department: Coordinator for the Centre Courtyard Garden – Liaison with Campus Head Gardener
- UBC Farm Committee/Cultivating Place Steering Committee, University of British Columbia, Vancouver, B.C.: Sept., 2001 to present
- FC^3 (Forest Classroom in the Canopy Committee) – **Chair/Coordinator**, planning the installation of an educational canopy walkway in forest on campus, the walkway was eventually installed at the UBC Botanical Garden (2006)
- Organization Committee for the 2005 UBC Farm Research and Education Symposium **Chair** (Apr. 2005)

Merit and Peer Evaluation Committees (University of British Columbia, Vancouver, B.C.):

- Botany Department Merit Committee (June, 2001, 2004)
- Botany Department Peer Evaluation Committee 2002-present (Jeanette Whitton, Patrick Keeling, Joerg Bohlmann, Mary Berbee, Sean Graham, Mark Velland, Sunita Chowrira, Celeste Leander, Naomi Fast, Patrick Martone)
- Tenure Evaluation: Mark McLean, Mathematics (2006), Joanne Fox, Michael Smith (2011), Michael Hunt, Physiotherapy (2012)

Teaching and Learning Technology Committees and Activities (University of British Columbia, B.C.):

- Pilots: upgrade from Vista to Blackboard upgrades (August, 2011 – present)
- Moodle/Blackboard: Hands-On Product Testing: February, 2011
- Biology Website Committee, **Chair**: Sept 2010 – present
  The Biology website has been updated, but we are currently working on an advising function to help students develop their plan
- Moodle/Blackboard Trial Conversion (evaluating the efficiency with which Vista site migrated into two platforms): February, 2011
- Pilots: upgrade from WebCT to Vista (June 2006 – May 2007)
- Pilot: e-portfolio (my e-porfolio was used as a model at presentations) (Sept 2005 – April, 2008)
- E-Portfolio Community of Practice (2009 – present)
- ACETS Committee (Advisory Committee for e-Technology Systems) – Botany Representative (2005 – present) – evaluates online course delivery systems

Additional University Activities

- Imagine Day Coordinator for: General Science, Combined Major, University of British Columbia, Vancouver, B.C., (2009, 2010, 2011)
- Second Year Information Session – Coordinator/Presenter, University of British Columbia, Vancouver, B.C., (Feb. 2012)
- General Science Information Session – Coordinator/Presenter University of British Columbia, Vancouver, B.C., (Sept. 2008, Jan. 2009, Jan. 2010, Jan. 2011)
- Combined Major Science Information Session - Coordinator/Presenter, University of British Columbia, Vancouver, B.C., (Nov. 2010)
- BIOTAP (Biology TA Prep) workshop participation/presentation University of British Columbia, Vancouver, B.C., Oct. 2011)
- UBC Farm Practicum Program: Botany Basics, Woody Herbs, and Medicinal Plants. University of British Columbia, Vancouver, B.C., July 2011
- Moodle/Blackboard: Hands-On Product Testing, University of British Columbia, Vancouver, B.C.: 2011
- Moodle/Blackboard Trial Conversion (evaluating the efficiency with which Vista site migrated into two platforms), University of British Columbia, Vancouver, B.C.: 2011
- Faculty of Science Review, participated as panel member, University of British Columbia, Vancouver, B.C., Sept 2011

- Facilitator: Med School Mock-Interviews - Career Services, University of British Columbia, Vancouver, B.C. (Nov, 2011)
- Public Liaison, Botany Department, University of British Columbia, Vancouver, B.C., (Sept., 1995 - Sept., 1998; Sept., 2001 - present)
- "A Walk on the Green Side" – a one-hour tour of UBC for the 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011 Greater Vancouver Regional Science Fairs – we examine trees, history, and sustainability at UBC
- Information Sessions for Broad Base Admissions Committee (March 2007, 2008, 2009) – first year admissions based on using a range of criteria beyond grades and standardized test, University of British Columbia, Vancouver, B.C.
- Teaching and Undergraduate Affairs Committee (Sept., 2000 - present)
- Botany Departmental Web Master (May 1995 – November, 2004)
- UBC Medicinal Plant Garden – Organization Committee Chair, University of British Columbia, Vancouver, B.C. (2005 - present)
- Online Advising Night for International Students, University of British Columbia, Vancouver, B.C., (April 20, 2004)
- Faculty of Science – Undergraduate Research Showcase – Botany Department Display Table (2003)
- Faculty of Science - Parents Night, University of British Columbia, Vancouver, B.C., (2001, 2002)
- SEEDS (Social Ecological Economic Development Studies) Project - Cliff Remediation, Vegetation Assessment - in collaboration with the Campus Planning and Development Office (Tom Lewellin, Architect) (2000w)

Graduation (University of British Columbia, Vancouver, B.C.):

- In Graduation Processions (Spring 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011; Fall 1998, 1999, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010)
- Marshaled and ushered for Graduation (2004 - 2011) – duties include giving the address to graduates prior to procession to the Chan Centre

Student Service and Advising (University of British Columbia, Vancouver, B.C.):

I have been a student academic advisor since 1996. My role is to provide advice, guidance, and support to students through their degree. It is one thing to treat all students fairly in accordance with the rules that pervade academic programming, but we also need to recognize when life is unfair to a student and when and how to bend rules. UBC is a big complicated place. Being aware of the roles of other units on-campus is really important, but equally important is preventing students from getting shuffled around. I really try to help the student make their way efficiently through the system often by serving as an intermediary.

I treat students respectfully and regard each inquiry as if I had never heard it before. Sometimes what I have to tell a student is unpleasant, but I try to do it with compassion and provide guidance as to how to deal with the situation and move forward. Many challenges face our students. Some are self-imposed while others are out of their control. Early adulthood can be difficult for a number of reasons. I try to be aware of and perceptive to diversity and signs of students at risk; they can be difficult to detect. The Positive Space, QPR (Question, Persuade and Refer) Suicide Prevention, and Respectful Environment workshops have been helpful not only to make me more aware of areas of sensitivity, but also provide me with insight in dealing with the various scenarios that arise. I am not a counselor, but I know where to take students to see one or lend an ear to students when they need it.

To facilitate advising I have held information sessions, developed program worksheets, and provided online support for General Science, Combined Major in Science, and the new Biology program. I also notify students by email about program updates (not too often as I know they are bombarded with emails). Information sessions either as evening events or part of Imagine UBC provide information about programs and other opportunities as well as build community. Currently, as the Associate Head of Biology, I am the primary advisor for the new program and honours in Biology. My office is now adjacent to the Biology Undergraduate Office so I can meet with students more regularly and be in direct contact with the operations of the Biology Office.

One of my objectives as the Associate Head of Biology is to support BIOSOC (The UBC Undergraduate Biological Sciences Society). My first step is to improve their office space. We were unsuccessful in our recent

application for funds to upgrade their space and are currently looking at alternative resources to upgrade their computers and facilities.

Student Advising-related Activities:

Advising:

- Biology Program Advisor – New Program: Second Year, Honours: May, 2011 - present
- Biology Program Advisor – General Biology: Sept., 2000 - 2009
- Biology Program Advisor – Plant Biology: Sept., 2000 – present
- Integrated Sciences Program Advisor: May 2003 – January 2005
- Faculty Advisor: Sept, 1996 – November 2004

Activities:

- Service Excellence Conference: October 19, 2011
- Finding Your Path: Follow the Yellow Brick Road - Aboriginal Student Lunch Presentation: Oct. 2011
- Imagine Info Session and BBQ (Coordination and presentation): 2009, 2010, 2011
- Imagine Mentor: Sept. 1999 - 2009
- Teaching and Undergraduate Affairs Committee, Biology Program: Sept., 2000 – present
- Imagine Professor (Sept, 2001 – 2009)
- UBC Trimentoring Program (2003 – 2010)
- Service Excellence Conference: June 7, 2010
- BioSoc activities (Research Nights, Meet your Prof)

11. SERVICE TO THE COMMUNITY

(a) Memberships on scholarly societies

* AAAS (Advancing Science Serving Society) (January 2012 - present)
* American Bryological and Lichenological Society (ABLS) (September 2008 - present)
* ISSOTL (International Society for the Scholarship of Teaching and Learning) (October 2005 – October 2010, June 2011 - present)
* ISTE (International Society for Teaching and Technology) (October 2005 – October 2010)
* Botanical Society of Canada (April 2008 – July 2009)
  Fieldtrip coordinator at BOTANY 2008 conference
* Native Plant Society of B.C. - Board of Directors and member of the Development Committee (Sept., 2001 – March 2005)
* Native Plant Society of British Columbia (Director and member of the Development Committee) – until March 2005
* Memberships in the Vancouver Natural History Society (2000 – 2005), Mycological Society of BC (2008 – present), Bums Bog Conservation Society (2000 – present)

(f) Reviewer

Reviewer for interactive exercises for: Raven, P.H., Evert, R.F., and S.E. Eichorn, *Biology of Plants*, Eighth Edition, W. H. Freeman and Company (release date March 1, 2012) (current)

Content Reviewer: Bryophyte Exhibits, Beaty Museum, University of British Columbia, 2010 – 2011

Reviewer for *Davidsonia – Journal of Botanical Garden Science, University of British Columbia* (Aug., 2011)

Ellis, Shona 2004 Book Review: Capturing Wildflowers, A review of 8 local wildflower books (authors: Lewis Clark, J. Duane Sept, John G. Trelawny, Collin Varner), *Discovery* 25: 174- 175.

Ellis, Shona 1996 Book Review: Hiking the Ancient Forests of British Columbia and Washington. by Randy Stoltman. *Discovery* 25: 174- 175.

Ellis, Shona 1996 Book Review: Coastal Wildflowers of British Columbia and the Pacific Northwest. by Elizabeth L. Horn. *Discovery* 25: 85-86.

(h) Consultant

- Botanical Editor of Discovery (Publication of the Vancouver Natural History Society), 1994 - 1996

(i) Other service to the community

There are many inquiring minds outside the gates of the university. One of our responsibilities is to make science more accessible to the public. I work with a number of groups ranging in age and backgrounds. It has been an education for me as well as them. Many activities I do on a regular basis while others are ad-hoc. School groups and other interest groups such as the Native Plant Society and the Mycological Society are eager to go on fieldtrips as well as explore the microscopic world of organisms. Developing these programs is not only very rewarding personally, but also an excellent creative outlet.

Scientist in Residence Program – SRP (Vancouver School Board)
I have been involved with the SRP since 2007. There are between 7 and 10 scientists invited to participate each year. Each scientist is matched with two teachers in an elementary school in the Vancouver School District. The scientist and teachers collaborate to develop at least 6 science lessons over the year, that include experimentation and the scientific method. The IRP (Ministry of Education) includes the prescribed learning outcomes (PLO) by year level which help guide the topics and level of detail. My sessions include classroom, lab, and fieldtrip activities. The lesson plans are published on the Scientist in Residence website (Appendix B, pgs A-37, A-45)
Links to my SRP lessons: http://blogs.ubc.ca/shonaellis/2011/10/17/scientist-in-residence/

Schools partnered with:
Charles Dickens Elementary School – Grades (3), 4, and 5 (2007/2008)
False Creek Elementary School - Grade 2 (2008/2009)
Sir John Franklin Elementary – Grades 2/3 and 6 (2009/2010)
Carleton Elementary – Grade 4 (2010/2011)
Mount Pleasant Elementary – Grades 5/6 and 6/7 (2011/2012)

Brainwave (2012)
Summer camp for children: Fieldtrip to Camosun Bog and Forest

Science 101 (2000, 2001, 2002, 2005, 2007, 2009, 2010, 2011, 2012)
Underprivileged adults from the Vancouver Eastside apply for this program. It is summer long and volunteers from different departments in the Faculty Science volunteer their time to put on activities for the students. I generally do an evening lecture (this year was Plant Sex) and another day of fieldtrip and lab activities. I have given a speech at two of the graduation ceremonies. Science 101 is one of the most rewarding outreach activities I do. It is so satisfying watching these students discover the intricacies of nature around them.

Aboriginal Summer Science (science with First Nations high school students)
Faculty of Science
(2002, 2003, 2005, 2006, 2008, 2009, 2010)
First Nations students make up a small proportion of students on-campus. This program helps to make university a less intimidating option. The youth interact with university students and faculty members while learning about different aspects of science. I incorporate fieldtrips or lab activities in my program.

CEDAR Summer Camp (science with First Nations middle school students)
(2008, 2009, 2010, 2012)
Faculties of Science and Land and Food Systems
This educational outreach program brings youth to UBC to explore in the field and lab. I have done plant-related lab programs. One of my activities was called Carnivores to Conifers.

Salmonberry Days (Dunbar Residence Association)
Botanical identification activity (game) at the Salmonberry Festival (one day, May 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011)
The month of May, known as Salmonberry Days, is full of activities in the Dunbar community. The Salmonberry Festival is held on the last Sunday of the month and every year I present a quiz table with three sets of quizzes (matching game) that test knowledge of trees, mosses, dinosaur plants, insectivorous plants, seaweed, etc. Dr. Lacey Samuels has been participating with me over the past four years.

Fieldtrips to Pacific Spirit (2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011)
During May, as part of Salmonberry Days, I lead a nature walk to Pacific Spirit Park/Camosun Bog to examine the diversity of local bryophytes.

Young Naturalists (Youth program through the Vancouver Natural History Society) – Lab program on different Topics: The World of Carnivorous Plants, (2003), Slime from the Sea (Nov. 2005), Plants that Stink (2007), Plants'n'Bugs (2008), Pollination Biology (2009), Plants that Kill (2010), The Little Things in Life (2012). Children ages 6 and up participate in this program of discovery through hands-on activities.

Camosun Bog Restoration Group – Biology 321 carry out annual vegetation surveys in collaboration with the CBRG. Identifications of bog species as well as potential invasive species have been made. CBRG lab days are coordinated for identification activities with members of the restoration group and Biol 321 students.

Stanley Park Nature House and Ecological Society
– collaborations with BIOL 321 (2002 – present) and BOTA 505B (2005 - 2006)
Current project: establish baseline vegetation data of the bog restoration project that has just begun. This will be carried forward annually to carry on long-term monitoring and data collection.
Previous projects: website, pamphlet (guide for trail walks), inventorying

Undergraduate Volunteers:

I would not be able to provide these programs without the assistance of undergraduate volunteers. I involve them in both the planning stages and teaching. Their participation has been very rewarding as I get to see them apply their botanical/biological knowledge. Students are also very pleased with themselves and many of them are eager to take part in other outreach activities. They are enthusiastic and serve as excellent role models for youth. Other volunteer activities include helping develop and maintain the Medicinal Garden at UBC Farm. Shannon Binns (Land and Food Systems) and I initiated the garden (2005) and it has become a component to a number of UBC Farm activities as well as a source of plant material for Biol 343 (plants and people).

Other Outreach Activities:

- Elementary Science Interest Group – Vancouver School Board, Vancouver, B.C. (2010 – present)
- Slideshow: "A Traveling Botanist" – Charles Dickens Elementary School, Vancouver, B.C. (April, 2009)
- Fieldtrip to Cates Park (Intertidal activities) – Charles Dickens Elementary School, Vancouver, B.C. (May 2008)
- Fieldtrip to UBC Farm (Agriculture/Forest), Vancouver, B.C. – June 2008
- Stanley Park fieldtrip with students from Columbia College, Vancouver, B.C. July 2007, 2008, 2009, 2010
- VanDusen Garden Lecture: "~~Messing~~ Mossing up the Garden", Vancouver, B.C. 2010
- "Being Green", December, 2003 and February, 2005, 2008 – Evening Program with Girl Guides, Vancouver, B.C.
- Grade 6 class from Ecole Jules Quesnel, Vancouver, B.C. – Microscopy Day – examining organisms from different ecosystems (2009).
- "Slime from the Sea" – for homeschooled elementary-aged children in Botany labs, Vancouver, B.C. (Nov. 2005),

- A Microscopic Look at Plants - an in-lab workshop with members of the South Coast Study Group of the Native Plant society of B. C., Vancouver, B.C. 2005
- "Being a Plant" – School visit to Queen Mary Elementary (MAC Class), Vancouver, B.C. May 2004
- Volunteer for UBC Farm forest trail upgrade project (2003) – developed Agroforestry Trail, Vancouver, B.C.
- Volunteer at VanDusen Plant Sale, Vancouver, B.C. (April, 2002, 2003, 2004)
- "Lunch 'n' Learn (for MDS Nordion staff members from TRIUMF) - Nature walk in Pacific Spirit Park (one lunch hour per year, University of B.C., Vancouver, B.C. (1999, 2000, 2001, 2002)
- Prince of Wales Mentorship Program (5 grade ten student, 1 grade 11), Vancouver, B.C. Sept. 2000 to Jan. 2004
- Fieldtrips for various school groups – kindergarten and grade 5 (e.g. Balcarra Bay trails, Delta Nature Reserve)
- Burns Bog Fieldtrip - Native Plant Society, Vancouver, B.C. (June, 2002)
- "Flowers to Fruit" – workshop for grade one students at Lord Roberts Annex (school visit)
- Bog Day Coordinator for Richmond Nature Park, Richmond, B.C. (July 2002)
- Slide show presentation at Bog Day: "Living in a Bog" (July, 2002, 2003, 2004)
- Slideshow "Flora of the Queen Charlotte Islands" for the Native Plant Society, Vancouver, B.C. (March, 2002)
- "Slog in the Bog" Weekend Workshop for the Native Plant Society, Vancouver, B.C. (August 2001)
- UBC Tree Walk (July 2001, 2002) with Dr. Tony Griffiths

12. AWARDS AND DISTINCTIONS

(a) Awards for Teaching (indicate name of award, awarding organizations, date)

* **KILLAM TEACHING AWARD - 2001W** and **2005W** —acknowledges outstanding contributions made in teaching at the University of British Columbia

(b) Awards for Service (indicate name of award, awarding organizations, date)

* **THE JUST DESSERTS AWARD - March 2000** and **2004** - for service to the students of the Science Undergraduate Society and Council (University of British Columbia)

* **Schwist** (Society of Canadian Women in Science and Technology and **DAWEG** (the Division for the Advancement of Women in Engineering and Geophysics) – **2003**, certificate "to recognize your efforts in promoting Women in Science, Engineering, and Technology"

THE UNIVERSITY OF BRITISH COLUMBIA
Publications Record

SURNAME: ELLIS **FIRST NAME**: SHONA **Initials**:
MIDDLE NAME(S): MARGARET **Date**:

1. REFEREED PUBLICATIONS

(a) Journals

Ryall, K., Whitton, J., Schofield,W.B., **Ellis**, **S.M.** and A.J. Shaw. 2005 Molecular Phylogenetic Study of Interspecific Variation in the Moss *Isothecium* (Brachytheciaceae). Systematic Botany 30: 242-247.

Ellis, S.M., 2004 *Arbor vitae*: A personal, teacher's view of tree-life on the University of British Columbia Campus *Davidsonia* 15:1 pages 15 – 33.

Ellis, S.M., Schofield, W.B., Haddad, N, Stewart, N., and J.K. Webb 2002 Bryophytes of UBC Botanical Garden *Davidsonia* 13:3 pages 35 – 43.

McCutcheon, A. T., Stokes, R. W., Thorson, L. M., **Ellis, S. M.,** Hancock, R. E. W., and Towers, G. H.N. 1997 Anti-Mycobacterial screening of British Columbian medicinal plants. *J. Ethnopharmacognosy* 35:77-103.

Razal, R. A., **Ellis, S. M.,** Singh, S., Lewis, N. U., and Towers, G. H. N. 1996 Nitrogen recycling in phenylpropanoid metabolism. *Phytochemistry* 41: 31-35.

McCutcheon, A. T., Roberts.T. E., Gibbons, E., **Ellis, S. M**., Babiuk, L. A., Hancock, R. E. W., and Towers, G. H.N. 1995 Antiviral screening of British Columbian medicinal plants. *J. Ethnopharmacology*. 49: 101-110.

McCutcheon, A. T., **Ellis, S. M.,** Hancock, R. E. W., and Towers, G. H.N. 1994 Antifungal screening of medicinal plants of British Columbian native peoples. *J. Ethnopharmacology* 44: 157-169.

Ellis, S. M., Balza, F., and Towers, G. H. N. 1993 A dithiacyclohexadiene polyyne alcohol from *Ambrosia chamissonis. Phytochemistry*: 33: 224-226.

McCutcheon, A. T., **Ellis, S. M.,** Hancock, R. E. W., and Towers, G. H.N. 1992 Antibiotic screening of medicinal plants of the British Columbian native peoples. *J. Ethnopharmacology*. 37: 213-223.

McDougall, S., **Ellis, S. M.,** and Taylor, I. E. P. 1988 The occurrence of polar structures in callus cultures from mature lodgepole pine (*Pinus contorta* var. *latifolia*). *Can. J. Bot*. 66: 2595-2596.

(b) Conference Proceedings

Ellis, S. M., Balza, F., Constabel, P., Hudson, J.B. and Towers, G. H. N. 1995 Thiarubrines: Novel Dithiacyclohexadiene Polyyne Photosensitizers from Higher Plants In: *Light-Activated Pest Control. ACS Symposium Series 616*, Eds. Heitz, J.R., and Downum, K.R., pp. 174-178.

Towers, G. H. N. and **Ellis, S. M.** 1993 Secondary Metabolism in Plant Cultures Transformed with *Agrobacterium tumefaciens* and *A. rhizogenes*. CRC In: *Human Medicinal Agents from Plants ACS Symmposium Series 534*, Eds A. D. Kinghorn and M. F. Balanrin, pp. 56-78.

Ellis, S. M, Balza, F., Constabel, P., Hudson, J.B. and Towers, G. H. N. 1995 Thiarubrines: Novel Dithiacyclohexadiene Polyyne Photosensitizers from Higher Plants In: *Light-Activated Pest Control. ACS Symposium Series 616*, Eds. Heitz, J.R., and Downum, K.R., pp. 174-178.

Towers, G. H. N. and **Ellis, S. M.** 1993 Secondary Metabolism in Plant Cultures Transformed with *Agrobacterium tumefaciens* and *A. rhizogenes*. CRC In: *Human Medicinal Agents from Plants ACS Symmposium Series 534*, Eds A. D. Kinghorn and M. F. Balanrin, pp. 56-78.

(c) Others

ELLIS, **S. M.** Thiarubrine Production in Roots and Root Cultures of *Ambrosia chamissonis*. **M. Sc. Thesis.** University of British Columbia, Vancouver, **July 1993**

2. NON-REFEREED PUBLICATIONS

Ellis, Shona 2007-2011- Lesson Plans for Scientist in Residence Program submitted annually (Vancouver School Board)
Links to Lesson Plan Section of SRP Website:
http://scientistinresidence.ca/science-lesson-plans/
Link to specific lesson plans from e-portfolio:
http://blogs.ubc.ca/shonaellis/2011/10/17/scientist-in-residence/

Glime, Janice M., 2007. Bryophyte Ecology, Volume 1. *Physiological Ecology*. Ebook sponsored by Michigan Technological University and the International Association of Bryologists.
Image contributions:
http://www.bryoecol.mtu.edu/chapters/7-4WaterStratLeaf.pdf: SEM of papillae on *Tortula muralis*
http://www.bryoecol.mtu.edu/chapters/2-6Andreaeopsida.pdf: Nematodontous peristome teeth of *Tetraphis pellucida, Andreaeobryum macrosporum* with valvate capsules, Epiphragm of *Polytrichum* (SEM). Protonemal flaps of *Tetraphis pellucida*, Leaves and antheridia of *Tetraphis pellucida*.
http://www.bryoecol.mtu.edu/chapters/2-7Bryopsida.pdf: Electron micrograph of the arthrodontous peristome teeth of the moss *Eurhynchium praelongum*

Recovery Strategy for the Margined Streamside Moss (*Scouleria marginata* Britt) in British Columbia, 2007, Ministry of the Environment – picture provided of *Scouleria marinata*
http://www.env.gov.bc.ca/wld/documents/recovery/rcvrystrat/scouleria_marg_rcvry_strat_010807.pdf

Recovery Strategy for the Silver Hair Moss (*Fabronia pusilla* Raddi) in British Columbia, 2007, Ministry of the Environment – picture provided of *Fabronia pusilla*
http://www.env.gov.bc.ca/wld/documents/recovery/rcvrystrat/fabronia_pusil_rcvry_strat_010807.pdf

Ellis, Shona 2005 Botanical Dust: The most valuable 'dust' in the work – pollen *Nature Wild (Magazine for the Young Naturists' Club of British Columbia)* 25: 174- 175.

Ellis, Shona and Wilf Schofield 2001 Slog in the Bog. *Menziesia*. 6(4): 10 – 11.

3. BOOKS

Chapters:

Nachonechny, J and **S. M. Ellis** (2012) Bryofolios: Individual and Group E-portfolio Learning Spaces for Developing Authentic Science Scholars. In D. Cambridge (Ed.), Hershey PA: *Global Diffusion of E-Portfolios*: IGI Global Publications

Ellis, S. M. and Towers, G. H. N. 1993 Root cultures of Asteraceae as sources of thiarubrines and other polyyne antibiotics. In Advances in Developmental Biology and Biotechnology of Higher Plants.(W. Y Soh, J. R. Liu, and A. Komamine eds.) *The Korean Society of Plant Tissue Culture*, pp. 454-473.

6. ARTISTIC WORKS, PERFORMANCES, DESIGNS

e-Portfolio Website developed as part of promotion package (2011)
Link: http://blogs.ubc.ca/shonaellis/

Videos for Plant Biology – With Excellence fund (Faculty of Science) - two undergraduate students and I developed videos for lectures and course websites (2010-2011):

- Life Cycle of Moss, Development of Peristome Teeth (Moss)
- Periclinal and Anticlinal Cell Division
- Differentiation of Vascular Tissue in Coleus
- Differentiation of Vascular Tissue in Monocots
- Wood Sections, Fertilization and Seed Development in Conifers
- Fertilization and Seed Development in Angiosperms
- Buzz Pollination (Claymation)
- Hornwort/Cyanobacteria Symbiosis (Claymation)
- Bean Germination 1 and 2 (Time Lapse)
- Plant Mating Systems: gametophytic and sporophytic self incompatibility
- Plant Life Cycles

Link through e-Portfolio: http://blogs.ubc.ca/shonaellis/2011/10/29/videos-developed-for-biology-courses/

Vancouver Board of Education: In Session: The Scientist in Residence Program (2008) – - a promotional video

Musical performance (guest spot) at the Biology and General Science Programs Imagine Day accompanied by ATP: “La Bombas” (2010)

Musical performance at the Biology and General Science Programs Imagine Day accompanied by the Hegemone Award winning band ATP:
“Every Slide you Break”, “I’m a Stranger Here”, “La Bombas”, and “Imagine” (2009)

Musical performance at the Prof’s “Talent” Show (for Science Week, Jan, 2007):
“La Bombas” performed by Patsy and the Holdfasts: Shona Ellis (vocals, kazoo) and Martin Adamson (instrumentals, guitar).

Musical performance at the Prof’s “Talent” Show (for Science Week, Jan, 2006):
“Collecting After Midnight” performed by Patsy Slime and the Holdfasts: Shona Ellis (vocals) and Martin Adamson (instrumentals, guitar).

Turkington, R., E. John, and M. R. Dale 2001 Herbs and Grasses In: *Ecosystem Dynamics of the Boreal Forest - the Kluane Project* (C. J. Krebs, S. Boutin, and R. Boonstra eds.) Oxford University Press, illustrations p. 89

8. WORK SUBMITTED

9. WORK IN PROGRESS

To be submitted in 2012: Kasinsky, H. (University of British Columbia, Zoology), Marsten, G. (University of British Columbia, BioImaging Facility), Ausio, J. (University of Victoria, Biochemistry), and **S. M. Ellis** ‘Dynamic Aspects of Spermiogenic Chromatin Patterning in *Chara* and Liverworts During the Histone-to-Protamine Transition’ Tentative journal: Tissue and Cell

Online interactive ‘Key to *Sphagnum* species of Greater Vancouver’ (release: May, 2012)