

Graduate Student Handbook

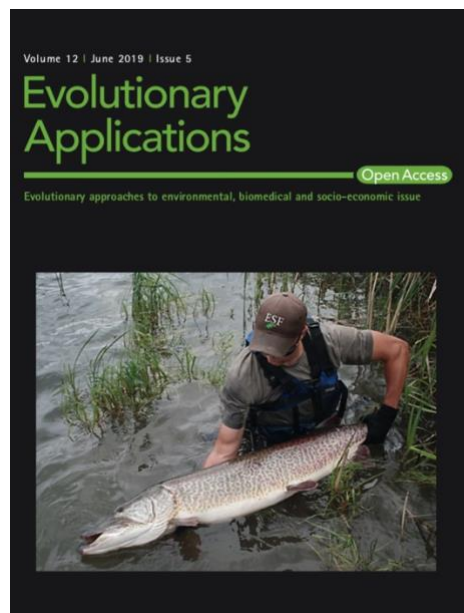


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I. INTRODUCTION

Purpose

The Department of Environmental Biology has a deep concern for the development and application of interdisciplinary approaches to the stewardship of natural resources and environmental quality. The purpose of this handbook is to serve as a guide to policies and procedures of EB's graduate programs to help you become a successful graduate student. After you read this handbook, you will have the tools to work with your major professor and steering committee to develop the best possible program of study.

Policies that pertain to you are set at several levels. The New York State Education Department and the State University of New York (SUNY) establish basic policies for all graduate programs. The ESF Graduate School has also adopted a comprehensive set of graduate policies. These are published in the [College catalog](#). In addition, EB has developed specific policies, procedures, and guidelines for our graduate programs.

Please note that you should review the section that refers to *your* graduate degree program and the appendices referred to in that degree program. All graduate students should read the sections on "Resources" and "Procedures and Policies."

Helpful sites with information regarding graduate student life at SUNY ESF include the [Graduate Student Association's Facebook page](#), the [Graduate Student Orientation Guide](#), and ESF's [frequently asked questions site](#).

Environmental Biology's Mission Statement

From Molecules to Ecosystems: The critical importance of natural resources and environmental quality to modern society demands that aspiring biologists both understand natural ecosystems and learn to be effective problem solvers. The department offers a dynamic array of professional opportunities in biology via course work enriched by an active program of research. Much of the research focuses on important environmental and ecological issues, e.g., forest, wetland and aquatic ecosystem research involving diverse flora and fauna, often utilizing our many field facilities in New York State, but our research encompasses areas throughout the world. The distinction between the field and laboratory research is now beginning to blur as molecular techniques offer tools for all aspects of biology including conservation biology, taxonomy and evolution.

We are always looking for ways to improve this handbook and our advising services. Please let us know what we can do to make your graduate program more effective

Dr. Jonathan Cohen, Graduate Program Director & Associate Chair
Dr. Melissa K. Fierke, Chair

II. RESOURCES

A. Important EB Contacts

Department Chair: Dr. [Melissa K. Fierke](#) is the Chair of the Department of Environmental Biology (EB). Her office is located adjacent to 242 Illick Hall. Her phone number is 315-470-6809 and her email address is mkfierke@esf.edu.

Graduate Program Director (GD) and Associate Chair: Dr. [Jonathan Cohen](#) is EB's Graduate Program Director, who coordinates the MPS, MS, and PhD degree programs. His office is located in 403 Illick Hall. His phone number is 315-470-6737 and his email address is jcohen14@esf.edu. Feel free to contact him regarding any questions, comments, or concerns about EB graduate programs. The GD signs all graduate forms (for the Department Chair).

Graduate Program Advisory Committee (GPAC): The goals of this committee are to develop, update, and revise EB graduate program policies and respond to graduate student concerns as they arise. The committee meets throughout the semester and has an MS and a PhD graduate student representative. Please contact the committee chair if you have ideas for activities related to student-faculty social interactions or if you have interest in serving on the committee.

Graduate Program Administrative Assistant (GAA): Ms. Danielle Kavanagh is the Administrative Assistant to the Chair and our Graduate Program. Her office is in 242 Illick Hall. Her phone number is 315-470-6760 and her email address is dekavana@esf.edu. Ms. Kavanagh is the record keeper for the graduate program. She records changes in your local address, phone number, etc. In addition, she monitors the status of various aspects of your program on a database. It is important to keep her informed of all changes, additions, or deletions of information in your program.

Department Office Assistant: Ms. Dawn Graney (241 Illick) is also available to help and facilitate many graduate student activities - as described below.

B. Assistantships

Graduate Teaching Assistantships (GTAs)

GTAs primarily assist EB faculty in teaching undergraduate courses. Each year, EB awards GTAs based on departmental criteria (including GPA and GRE scores, previous degrees, publications – see the next section for EB policies on awarding GTAs) as well as faculty recommendations.

Assistantship stipends are \$14,000 for MS students and \$16,000 for PhD students per academic year. In addition, insurance (single-coverage: vision, medical, and dental) is available and partially covered as well as a tuition scholarship (value = ~\$11,000–23,000) is awarded. Students who hold assistantships must be enrolled for full-time study as defined by graduate policies and be making satisfactory progress toward completing their degrees. Beginning graduate students may apply for assistantships on their application for admission. *Assistantships do not cover broad based fees.* In addition, Major Professors may provide summer support on funded research and additional funding may be applied for, including merit-based awards (see next page).

Graduate Research Assistantships (GRAs)

As a research university, SUNY-ESF is involved in numerous externally funded projects, many of which support graduate students through GRAs. Each project is managed by a Principal Investigator (a faculty member), who is responsible for selecting Graduate Research Assistants. Students interested in GRAs should discuss opportunities with their major professor. Additionally, some graduate students have been successful in submitting grant proposals that include funding for a GRA. Amounts of GRA

stipends vary, depending on the grant budget, insurance is available, and a tuition scholarship is awarded in most cases. *Assistantships do not cover broad based fees (~\$800/semester).*

C. Awards and Scholarships

EB students have obtained many kinds of awards/scholarships. For example, [Fink Career Fellowships](#) fund internships and travel to conferences. Fink Fellowship awards have ranged from \$200 to \$3,500. The Fink Career Fellowship will support up to \$500 for conference presentation and up to \$200 for conference attendance. The Fink Fellowship will also accept applications for costs of attending an institute, workshop, or symposium. The Fink Fellowship does not support funding for required academic work, thesis or dissertation-related research, or to pay for tuition of any kind. Another commonly received fellowship for EB graduate students is via the [Edna Bailey Sussman Fund](#). This provides stipends to graduate students to support semester-long and summer internship experiences. Sussman fellowships support a broad range of interest areas, including all areas in environmental and forest biology, and forest and natural resources management. Sussman applications are very competitive. Awards are usually in the range of \$7,000–\$9,000. Interested students should look for an email calling for proposals from the Office of Instruction and Graduate Studies (227 Bray Hall) and check the ESF Sussman website.

SUNY-ESF's Graduate Diversity Fellowship Program provides financial support, which may include full in-state tuition and a stipend, to graduate students who contribute to the diversity of the student body in their graduate programs and have overcome a disadvantage or other impediment to success in higher education. Funding is available for a maximum duration of two years for a master's degree and three years for a doctoral degree. Interested students should request an application from the Office of Instruction and Graduate Studies (227 Bray Hall).

Please see the ESF [Graduate Student website](#) for more awards that our students have recently won.

EB Departmental Scholarships & Fellowships

Maurice M. & Annette B. Alexander Wetland Research Award: established in honor of Professor Alexander '40 and Mrs. Alexander by family and former students, to provide annual support for graduate research in wetland ecology and management.

Wilford A. Dence Fellowship: awarded to advanced degree candidates on the basis of academic achievement and demonstrated potential for a successful professional career in fish and wildlife management, research, or education. Recipients should project an enthusiasm for the biotic world, fish, wildlife, and natural history, show an aptitude and ability for field research, and demonstrate a continuing concern for the preservation of ecosystem diversity, stability, and vitality.

Samuel Grober '38 Graduate Fellowship: supports the work of a graduate student in the area of forest health and ecosystems research, and teaching at Cranberry Lake Biological Station (CLBS). Dr. Grober attended forestry camp in 1936 at what is now CLBS and credited that experience for much of his success throughout his life.

Edwin H. Ketchledge Scholarship: established in memory of Dr. Edwin H. Ketchledge to assist graduate or undergraduate students of ecology. The Department Chair shall select recipients on the basis of academic achievement, ideally with interests in teaching, wilderness and the Adirondacks.

Josiah Lowe & Hugh Wilcox Scholarship: established in 1996 to assist students pursuing graduate level studies in plant physiology, mycology, and plant pathology in honor of two legendary professors, Josiah Lowe and Hugh Wilcox.

Savel B. Silverborg Memorial Scholarship: established in memory of Savel B. Silverborg, former ESF faculty member in EB and expert in forest pathology, to assist deserving Environmental and Forest Biology students.

John & Henrietta Simeone Endowed Fellowship: established to provide aid to a deserving graduate student in Forest Entomology by renowned ESF faculty emeritus and forest entomologist.

Leroy C. Stegeman Endowment in Invertebrate Ecology: recognizes excellence through travel grants to encourage graduate students to present their research. This fund honors Dr. Leroy C. Stegeman, who retired in 1965 after 36 years of service as a Professor of Zoology

Robert A. Zabel Endowed Scholarship: supports students pursuing a graduate degree with emphasis in mycology, forest pathology, wood decay, and/or microbiology. Established to honor the lifetime academic achievements of Robert A. Zabel whose 50 yr association with ESF began as a student and expanded to professor, dean, and vice president.

Robert L. Burgess Outstanding PhD Award: recognizes advanced doctoral students in Environmental and Forest Biology who passed their candidacy exams and have excelled in all facets of their graduate program, including excellence in research (as evidenced by scholarly publications and grant writing), excellence in teaching (including and beyond a Departmental TA), as well as campus/departmental leadership and service (e.g., significant outreach activity including meaningful educational initiatives in K–12 or contributions to the larger community).

Moore Family Fund for Wildlife Conservation: supports outstanding graduate students pursuing applied research in animal conservation associated with the Roosevelt Wildlife Station. Nominees for this award are dedicated to discovering innovative and substantive solutions to the challenges facing wildlife conservation, and have demonstrated the grit, integrity, humility and communication skills required to be an effective conservation leader.

III. POLICIES AND PROCEDURES¹

A. Prospective Graduate Students

Applying to EB

Advice on applying to an EB graduate program can be found on [EB's graduate student webpage](#).

Choosing a Major Professor - Each admitted graduate student must have a major professor willing to provide mentoring through the graduate program. It is strongly recommended that applicants peruse the [EB Directory](#) to identify and then contact at potential major professors prior to submitting an application.

While GRE scores and GPA are important to our evaluation of graduate applications, other factors are also fundamental to the admission decision: strong letters of reference (preferably from former professors, academic/research employers, or advisors) indicating the applicant's ability to succeed in graduate school, prior experience in the field, a well written, i.e. clear and concise, statement of educational goals, and other experiences or qualifications indicating potential for graduate study.

EB requires GRE test scores as part of a complete application. The Biology Subject Test is not required by the Department or College.

EB will only accept GRE test scores (or other types of graduate record exam scores, such as LSATs or GMATs) for exams taken within the past five years with the following provisions:

1. The applicant successfully completed a graduate degree within five years of the date when the GRE exam was taken.

2. The applicant is actively pursuing and completing a graduate degree in a timely manner, thus already showing success in graduate studies.
-

¹Includes both College and EB policies. EB specific policies approved by EB faculty May 5, 2017.

Awarding Departmental Graduate Teaching Assistantships

GTAs are renewed on an annual basis, based on satisfactory teaching evaluations and progress toward the student's degree. They are typically awarded for two years (four semesters) for M.S. students, three years (six semesters) for Ph.D. candidates who have a Master's degree, and four years (eight semesters) for students who go straight from B.S. to Ph.D. (where a Master's degree is skipped). All dates are from first matriculation into the EB program. These terms are dependent upon satisfactory performance and progress towards degree completion.

Graduate teaching assistantships are awarded on a competitive basis relative to other applicants in the applicant pool each year. As such, the exact details may vary from year to year, but in general, competitive applicants will have:

1. An academic record showing a minimum GPA of at least a B (3.0 on a scale of 4.0) average for the junior and senior year of a baccalaureate program. The higher the GPA, the more competitive. Few applicants with a GPA below 3.5 are offered a graduate teaching assistantship.
2. A combined GRE score of approximately 315 (verbal plus quantitative). The higher the GRE scores, the more competitive the applicant. Few applicants with GRE scores less than the 75^h percentile are offered a graduate teaching assistantship
3. Having a Masters degree in hand and peer-reviewed papers are also given strong consideration in EB's GTA formula.

GTA's are generally awarded to students in good standing according in this order of priorities:

- a. PhD students who have not used their GTA allotment (i.e. supported on an RA previously) and have been matriculated < 5 yr.
- b. MS students who have not used their GTA allotment (i.e. supported on an RA previously) and have been matriculated < 3 yr.
- c. New graduate applicants.
- d. PhD students who have been in their program < 5 yr but have used their 3 yr GTA allotment, but still need funding to finish.
- e. MS students who have been in their program < 3 yr but have used their 2 yr GTA allotment, but still need funding to finish.
- f. Finishing PhD students matriculated > 5 yr but < 7 yr.
- g. Finishing MS students matriculated > 3 yr but < 5 yr.
- h. MPS students.

Students receiving GTAs are notified by the ESF Graduate Office and Human Resources. GTA allocations are decided in the spring semester for the next academic year. Few GTAs are available for students applying to matriculate in the spring semester, however, if available, awards are decided after the November 1st spring application deadline.

Students who are eligible for a GTA, but not on a GTA, and would like to be considered should notify the GAA and submit a statement of support from their MP, along with information indicating they are making progress on their degree (see below). The GAA will provide the Dept Chair with this information to approve adding them to the Departmental "wish list". GTAs will be awarded to graduate students on the wish list with the above priorities in mind, but also considering the course needing a GTA and what is indicated as coursework completed and what the graduate indicates they can teach in the TA Application form.

Graduate Program Progress

1. The successful and timely progression of graduate students through their program is of utmost importance to the reputation and integrity of the Department. Benchmarks protect the student, MP, and Department and ensure graduate student are making satisfactory progress towards their degree.
2. Documented satisfactory progress:
 - a. MS students should have submitted Form 2A to form their committee, Form 3B indicating coursework towards their degree, and a Research Proposal Approval form indicating an approved research proposal by the end of their 2nd semester.
 - b. PhD students should have submitted Form 2A to form their committee and Form 3B indicating coursework towards their degree by the end of their 2nd semester and then a completed Research Proposal Approval form indicating an approved research proposal by the end of their 4th semester.
 - c. GTA appointments for MS students and PhD students will be renewed after the 1st and 2nd year, respectively, only if these requirements have been met.
 - d. GTA support after the 2nd semester for MS and 4th semester for Ph.D. students will depend upon proof of annual committee meetings as documented with a graduate self-evaluation form, even if the student has not used all of their allocated GTA semesters.
3. Exceptions will be considered on a case-by case basis at the Chair's discretion. Documented evidence of progress should be provided by the student and MP along with evidence of any mitigating factors.

Sloan Indigenous Graduate Partnership

Full assistantship funding is available to Native American students who apply and are admitted to STEM graduate programs associated with [ESF's Center for Native Peoples and the Environment](#) (CNPE). [CNPE SIGP](#) MS and MPS students receive an annual academic year stipend of \$18,000 and a full tuition scholarship guaranteed for two years with satisfactory academic progress. CNPE SIGP - PhD students receive an annual academic year stipend of \$16,000 and a full tuition scholarship guaranteed for four years with satisfactory academic progress, plus a \$40,000 discretionary award directly from SIGP in support of the student's research and related activities over the course of the four-year program. Interested applicants should contact Dr. [Robin Kimmerer](#) at the CNPE at rkimmer@esf.edu. Additional information on the SIGP at ESF can be found [here](#).

College Requirements

Please look over [requirements for Admission](#) per ESF's Graduate Office website.

For applicants whose native language is not English, [ESF's Office of International Studies](#) sets required minimums for official TOEFL scores, [depending on the test taken](#). If scores are lower, visa paperwork cannot be authorized. If an applicant's score is less than the minimum requirement, the applicant will be required to take the English Language Assessment Exam (ELAE) administered by Syracuse University. Based on results of that exam, the applicant may be directed to enroll in preparatory courses in English language usage.

International Students: [Office of International Education](#) primary requirements to apply are GRE scores, evidence of proficiency in the English language (TOEFL, IELTS, ELS, etc.) and transcripts. All transcripts submitted must be translated into English without any edits. Once accepted, a 'Commitment to Enroll form' will be mailed to the student. In order to receive the Visa, an I-20 is required from ESF for which the student must complete the 'FSA-4 - financial statement' along with

documents proving the student has funds to meet all expenses (tuition, fees, and living) for the first year of study. Any documentation of scholarships, assistantships, and fellowships must be in the form of an official award letter from the school or sponsoring agency. Any immigration related queries can be addressed to the Office of International education at OIE@esf.edu. Any graduate admission related queries can be addressed to The Graduate School at esfgrad@esf.edu.

If EB does not make a financial commitment to international students by July 16 for the fall semester, and December 15 for the spring semester, or if international students are unable to provide evidence of sufficient personal resources, the graduate application will be withdrawn and the Office of Instruction and Graduate Studies will ask them if they want their application deferred for spring enrollment or withdrawn from any further consideration.

B. Information for Accepted and Current Graduate Students

New student Orientation Presentation

College-wide Academic Policies

College-wide Graduate Forms

Graduate Forms

Please use the forms available on the [EB Graduate website](#). Electronic signatures as well as signed forms sent electronically to the Graduate Director are acceptable. Please leave paper forms needing Graduate Director signature with Danielle Kavanagh in Illick 241 (keep a copy for your records).

Course Registration

Start by looking at the fall semester schedule of classes, located on the [Registrar's website](#). Once you determine what courses are offered, you can cross-reference them with the course catalog (<http://www.esf.edu/catalog/>) for course descriptions. ESF students are also allowed to register for Syracuse University classes, so if you would like to see what classes SU offers, visit [SU's MySlice website](#). Use the "Schedule of Classes" link on the top right side of the page in the "Course Catalog/Class Search" box to look through courses.

Though not absolutely required, consultation with your advisor is highly recommended before you register for classes, particularly the first semester. Once you've decided on classes and the registration period for new students opens, you will need to log in to MySlice (even if you aren't taking SU classes). Once logged in, click "Enroll in a Class" on the right side of the page in the "Student Services" box. This will take you to "Add Classes" and ask you to select the semester for which you want to enroll.

You should only register for the minimum number of credits your first semester (12 for unfunded students and 9 for students on Graduate Research or Teaching Assistantships, GRAs or GTAs). It is also important to note that if you are on an GRA or a GTA, orientation and student fees are not covered, so you will need ~\$500 for these (please also note these fees increase if you sign up for more than the minimum number of credits).

Note that instructors may cancel graduate courses due to low enrollment, however, they normally wait until the first week of classes before doing so. This delay allows new and other graduate students who have not registered before the start of classes to enroll in the course.

Summer Start

New graduate students on a research assistantship can start in the summer with completion of an appointment form by the Major Professor. As you arrive on campus, you will need to check in with the graduate office and complete forms as needed (be sure to bring a passport or two forms of ID, i.e. a

driver's license and social security card). You will get your Student ID at Syracuse University in Rm 206 Steele Hall and then register for 1 credit hour of thesis research (an exception is if you were a full-time SUNY undergraduate the semester before – in this case, you do not have to sign up for a credit). You also need to apply for New York residency (see below) if you are an out of state student.

New York Residency

If you are not a resident of New York State, you have a semester in which to become a New York State resident for tuition purposes. If your tuition scholarship starts the first semester you are enrolled, it will cover the total tuition liability during that first semester. If your tuition scholarship continues for subsequent semesters, you will need to take steps to become a [New York State citizen](#) as the scholarship will only pay up to the maximum of in-state tuition charges. You will be responsible for paying the out-of-state tuition differential if you do not become a New York State resident.

Academic Performance

All graduate students are required to maintain at least a 3.0 cumulative grade point average (4.0 = A) for graduate level courses. Students who do not maintain this average, or who receive two or more grades of Unsatisfactory (U) for work on the thesis or project, will be placed on probation or suspended from ESF by the Associate Provost for Instruction and Dean of the Graduate School upon the recommendation of the College Subcommittee on Academic Standards.

Graduate Student Self-Evaluation Form

Completion and discussion of this form (Appendix E) is suggested annually for all continuing graduate students as an assurance that they are on track and communicating with their entire committee.

Defenses and Candidacy Exams

Defenses and exams are ordinarily held during the academic year, however, in certain circumstances, summer defenses of thesis/dissertation and candidacy exams can be held in the summer via approval by the Graduate Office.

Graduate Petition Process

Many graduate students manage to complete their entire degree programs without having to file a single petition. However, because of our students' diverse backgrounds, interests, degree programs, and personal lives, some of our students occasionally need a waiver of some College or EB policy, switch their graduate program major, or find a need to create proper documentation for their academic file. The correct way to do this is to use a [Petition](#).

Changing Degree Programs

Changing from an MPS to MS or MS to PhD

Students seeking to make one of these changes must submit a petition and provide an updated CV, a statement of educational goals, and written letters from two faculty members as well as the major professor. These letters should be of the same scope and content as faculty reviews in the online application system for new graduate students, with a detailed justification for a recommendation of acceptance into the new program. The major professor should provide a statement of funding source for the student. These switches may occur at any time in the student's academic program.

MPS to a PhD

An MPS student (or an MS student accepted originally into the MPS program) cannot switch to a PhD without going through the application process anew.

PhD to MS

Under extenuating circumstances (to be evaluated by the full steering committee or appropriate person in the Office of Student Affairs), it is possible to change from a PhD program to an MS program with a petition and without restrictions in the first two semesters in a student's program. Later in the student's program, the change will require a letter of support from the major professor and the steering committee as well as a petition. The student will submit these documents to the Graduate Director. Students should be aware that this change will impact the length of their eligibility for a graduate teaching assistantship. If the student does not have a steering committee, they must either form one and obtain the necessary supporting letters from the committee, or withdraw from the PhD program and reapply to the graduate school for admission as an MS.

PhD or MS to an MPS

Under extenuating circumstances (to be evaluated by the full steering committee or appropriate person in the Office of Student Affairs), it is possible to change to an MPS as follows:

- If the change occurs in the first two semesters of a student's program it can be done without restrictions via a petition with approval by the major professor and graduate program director.
- After the first year, a request to change to an MPS can be made only under the Professional Experience Option (i.e. not the Coursework Option). The change will require a letter (or letters) of support from the major professor and the steering committee as well as a petition. The student will submit these documents to the Graduate Director as part of the action on the petition.
 - * If the committee is not yet formed, then the student must withdraw from their degree program and reapply to the graduate school for admission as an MPS, and the application will be subject to a new review.
- Note that EFB899/999 (thesis/dissertation) credits converted to course credits (EFB798) will require a grade assigned by the major professor. Major Professors will not provide a letter of support for this change without having received all lab and field notebooks, equipment and data collected during the thesis program. Data, notebooks, and equipment will need to be submitted to the major professor in an acceptable format and condition.
- Students should be aware that these changes in their degree status will make them ineligible for a departmental graduate teaching assistantship.

Upon approval of the application (MPS to PhD) or the petition (all others), if a new Major Professor and committee are being established, the student is responsible to file new 2A (Request for Steering Committee) and 3B (Program of Study) forms.

Changing Departments

Students seeking to switch from another department must submit a petition and provide an updated CV, a statement of educational goals, and written letters from two faculty members as well as the major professor. These letters should be of the same scope and content as faculty reviews in the online application system for new graduate students, with a detailed justification for a recommendation of acceptance into the new program. The major professor should provide a statement of funding source for the student. These switches may occur at any time in the student's academic program.

Changing Steering Committee Members

Changing of major professors or steering committee members must be done with [Form 4](#) (Revisions to Form 3B Program of Study). The major professor or committee member to be removed must also sign Form 4.

Changing of steering committee members is not permitted under the following circumstances unless a current committee member is unable to fulfill his/her duty, or unless the student switches their degree program according to EB procedures:

- 1) Within the 30 days prior to a scheduling a candidacy or defense exam.
- 2) After a defense exam has taken place.

Students are reminded that if they do not pass their first attempt at a defense exam, they may have a second attempt, wherein the student passes the defense if there is not more than one negative vote.

Major Professors and graduate students should be aware of and ensure compliance with the following:

Laboratory Safety

All graduate students who will be handling hazardous chemicals must go through the proper lab safety training with ESF's [Environmental Health and Safety](#) Officer. The College has developed an extensive description of how students and employees can be protected from exposure to hazardous chemicals and situations that may endanger their health and safety. Please make sure to check out the manual on [Laboratory Safety Guide and Chemical Hygiene Plan](#).

Institutional Animal Care and Use Committee (IACUC):

The [ESF IACUC](#) has the obligation to prospectively review all uses of living vertebrate animals on campus for teaching, and laboratory/field research. Thereafter, IACUC monitors all animals on campus to insure they receive the highest standard of care. In addition, IACUC makes recommendations regarding capture, immobilization, anesthetization, handling, and treatment of animals in field studies. This is separate from any collecting permits (see below) you may need to obtain.

If you know your research will include vertebrate animals, it is a good idea to begin planning well in advance to ensure you have an approved animal protocol in place prior to the start of any work.

Typically IACUC meets every 2 months, and your protocol should be submitted at least 3 weeks in advance of a meeting. Generally, it is also a good idea to meet with the IACUC chair prior to this, in order to discuss what needs to be completed and if there is a template protocol that could be used. If you believe your work is exempt, then it is still important to get *in writing* from the ESF IACUC that this is the case. All personnel are required to complete training prior to approval. Specifics can be found on the ESF [IACUC web page](#), or you can contact the IACUC chair.

Institutional Review Board (IRB) – Human Subject Research

For any research involving humans as part of the research data (e.g., surveys, interviews, focus groups, medical research, etc.) you must get IRB approval. ESF uses the [Syracuse University's Office of Research Integrity and Protections](#) to review all research that falls under this category. To start the process, you, your major professor, and any research staff who will be helping collect data will need to take the [CITI training module on Human Subjects Research](#). After completing the module you will need to complete the appropriate [IRB application](#) and submit it to the ESF Research Office for review. After the initial submission all future communication can be done directly with the SU IRB office.

Most research in our department qualifies as either exempt or expedited. Even if your research meets the exempt requirements you still have to get IRB approval. It is always recommended to talk to the IRB office with any questions you have and to look over your application before submission. Once an application is submitted it can take up to two weeks for them to review. Each time you submit an amendment to the application, required correction, etc. it can take that two week period for the review, so you don't want to have to keep resubmitting multiple times.

It is advised to submit the IRB application at least a month before you want to start data collection but the earlier the better. Finally, it is your responsibility to keep them informed of changes to your project methods and to close the project with their office once it is completed.

Permits

Check with your Major Professor before beginning research. Should a project requiring a permit necessitate fieldwork out of state, permits will have to be obtained from any agencies involved including jurisdictions within other states, those states, or federal agencies. Please be aware that these types of permits often require a minimum of 6 months to acquire.

As an example, ESF maintains a single license for all members of the community. It is issued in the spring to the permit coordinator with the names of all designated agents known at the time listed. As new research projects are begun that require a permit, the coordinator submits required information (name, age, and contact information) to the DEC who issues a revised license listing additional designated agents. Per the instructions on the license, prior to collection activity, designated agents must notify relevant regional DEC offices of the date and location of planned activity. **Prior to license renewal** EACH designated agent must submit a report of all collecting activities from the previous year to the coordinator who then compiles all reports and submits them to the Special Licenses Unit within the Division of Fish, Wildlife and Marine Resources, DEC, Albany. This report must include the common name of the listed animals collected, the location and date of collection, the biological data collected (this is the actual data, not a summary and not a description), and the final disposition of the collected animals. Additional information can be found in the copy of the license distributed to each designated agent. Many designated agents find it convenient to submit existing excel spreadsheets. If comprehensive, this is acceptable. Please remember that delay in reporting, causes problems for everyone because a renewal cannot be processed until everyone has filed a report.

Certificate of Insurance (COI)

This is only required if a landowner, on whose property you are requesting permission to do research on, requests proof of liability insurance (which is automatic through the Research Foundation). When a COI is requested by a landowner, your project account manager in the Office of Research Programs (ORP) will help you fill out the COI request form, which is specific to that particular property and covers a finite time period. The request is then sent to the Insurance office at RF and a signed ACORD Certificate of Liability Insurance document is returned and can be given to the landowner.

Boat Safety

All operators of motorized boats must have completed an approved boater safety course, and must meet the requirements established in [SUNY ESF's Boat Use Policy](#)

Other Certifications: e.g., chainsaw certification, working with radioactive compounds, etc. are on a lab by lab basis and should be cleared through ESF's [Environmental Health and Safety Office](#).

Graduate Student Education Union

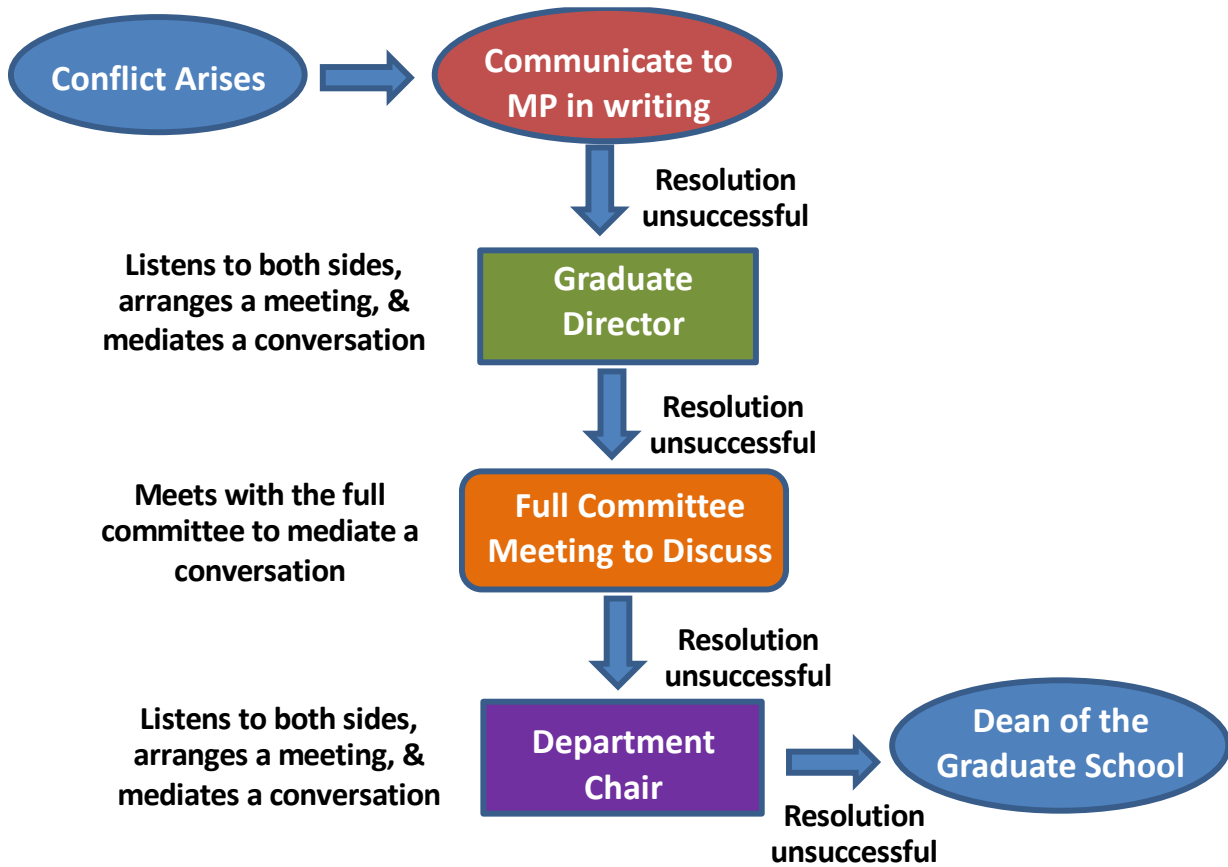
The CWA Local 1104/Graduate Student Education Union (GSEU) represents Graduate Assistants (GAs) at across the SUNY System. Most GAs at ESF are Teaching Assistants. GSEU represents and advocates for SUNY GAs on income, benefits, fees, and other workplace-related issues. You can become a GSEU member [here](#). We will advocate for and represent you regardless of GSEU membership, but high GSEU enrollment helps us make our case in contract negotiations, GSEU members can vote on contracts and in union elections, and union dues (2% of your salary) help fund union-related activities. Please know that GSEU does

not represent graduate students funded through Research Assistantships. For more information, visit [GSEU](#) or join us on Facebook at SUNY GSEU At Large.

C. Conflict Resolution

For nonacademic conflicts, please contact ESF's Student Affairs office for advice and options.

For academic conflicts, the following flowchart describes the *recommended* course of action should a conflict arise between a graduate student and major professor. Either party in the conflict may initiate the actions given below. The Graduate Director will act as an independent and impartial intermediary who represents departmental and college interests with their main objective being to facilitate communication and resolve conflicts.



D. Miscellaneous

Email Account: All SUNY-ESF students have an email account assigned to them by the Registrar. This is your official email address. EB will only use your official SUNY-ESF email address to send information concerning EB seminars, job/internship announcements, assistantships, notices from the registrar/ cashier, etc. As this is your official email account it is your responsibility to check it regularly and/or to link this e-mail account to your regular e-mail account so you receive important information. Students that fail to do so will not receive important broadcast messages sent by the Department or the College.

Office Space: The Department provides MS and PhD graduate students with desk space as needed and when available. The process of securing desk/office space is facilitated by your major professor and Ms. Dawn Graney.

Keys: Keys for office/desk space and related building access may be obtained by formal request to Dawn Graney. She will fill out cards and stamp the Chair's signature. For office door keys, student must take the card down to the Cashier's office (1st floor of Bray Hall) where a \$20 refundable deposit will be charged. For building access, you can request a fob or college ID card can be encoded for the outside card readers for a non-refundable \$20 fee. Students then take the receipts and the card to the University Police (19 Bray Hall) where the key will be ordered and a fob or your ID card encoded.

Parking: Graduate assistants funded on a GTA or RA are given a free parking pass to Standart Lot.

Office Supplies & Photocopying: If you are TAing a course and need general office supplies, please see Dawn Graney (241 Illick). An All-in-One Printer resides in 246 Illick and can be accessed during work hours. Graduate students may obtain an account number for photocopying through Ms. Graney.

Mailboxes: You will be assigned a mailbox in Illick 246 for your incoming college-related mail. Please have your ESF related mail sent to 246 Illick Hall.

Conference Rooms: Conference rooms in 6, 7, and 8 Illick Hall can be scheduled for meetings and seminars, including graduate student capstone seminars. The rooms may be scheduled for student meetings including committee meetings. During unscheduled periods these conference rooms are available for informal discussions and study. To reserve rooms, go to [ESF Spaces](#).

Computer Access: ESF and Syracuse University have various computer facilities available for student use. At ESF, computers are available in the student lounge (Illick 244), Moon Library, and the Academic Computer Center in Baker Laboratory (3rd Floor). Computer clusters at Syracuse University are described on their [web site](#). Microsoft Office is available for download on your own PC through the University – to do so, login into your @syr.edu email account and click the Settings gear icon in the top-right corner of the screen. Select Office 365 from app settings at the bottom of the bar. In the new tab that opens, choose Software from the menu, then click the Install button to download Office 365 to your device.

Printing: Graduate students are provided with 500 print credits each at ESF and SU campuses. The ESF print credits can be utilized at Moon Library and Baker Computer Lab. The SU print credits can be utilized at Carnegie and Byrd Library. It is one print credit per page; additional print credits are required for color prints. Matte-printed posters for presentations may also be printed at Baker Computer Lab for ~180 print credits. Glossy posters for presentation may be printed with ITS in the basement of Moon Library for a fee with a state or research account number.

SU Bookstore

You are entitled to a discount of 10% at the University Bookstore in the Schine Student Center at SU.

Travel

Please take a look at [ESF's travel website](#). For travel within New York, you should fill out a blanket travel statement – see Dawn Graney in the EB office. For travel outside of NY, you should fill out a Travel Authorization form. Travel for research and conferences is generally paid for off a research account, though there are also ESF travel awards (see below).

University Vehicles

University vehicles are available for approved travel to conferences, field sites, and class field trips within the state. Vehicle request forms can be found on the [Physical Plant website](#).

Purchasing Supplies for Research

General lab supplies (chemical reagents, glassware, gloves, etc.) can be purchased at the Analytical and Technical Stockroom (aka Chem Store) with a state or research account number. The Stockroom is located on the ground floor of Baker Lab. The catalogue can be found on the [Chem Store website](#).

Purchase request forms (POs) for both State and Research Foundation (RF) funds can be found online under Purchasing in [Office of Business Affairs](#). Forms, which are submitted to Purchasing in Bray, can be used for purchasing items as well as petty cash reimbursement. Each submission requires an itemized list and description, justification for the purchase, and a signature from the grant primary investigator or your advisor. If the total amount of the PO exceeds \$2,500 for State or \$5,000 for RF, submission requirements become more complicated. For specific details and instructions see the Purchasing website. For large POs, exceeding the above amounts, quotes from two additional vendors must be submitted. Ultimately, as the person submitting the PO, you have the authority to decide which vendor to use, but these quotes are required as part of the justification for the PO. The purchasing office is very helpful and will assist in helping find other vendors and generating the quotes if asked. An alternative method to submitting POs is to use the department Procurement Card (Pcard), which is through Dawn Graney in the main office. Your advisor can send an e-mail with an itemized list including links to the items for purchase and she will order and then reconcile to the grant to be charged. [Guidelines](#) for using the Pcard can be found on the Business Office website.

Thesis/Dissertation Binding: If you wish to have personal copies bound two binderies to explore are:

- [Book1One](#) in Rochester
- [Wert Bookbinding](#) out of PA

IV. MASTER OF PROFESSIONAL STUDIES

The Master of Professional Studies (MPS) graduate degree program enables students to integrate knowledge and expertise drawn from both the natural and social sciences, and to apply their knowledge to solve practical environmental and forest biology problems. The primary focus of the program is to provide an opportunity for graduates coming from related academic backgrounds with baccalaureates to gain a professional education in fields related to environmental biology. Graduates will successfully function as professional managers on multi-disciplinary teams and respond to the challenges related to the sustainable management of local, regional and global natural resources.

The program is open to both students with some prior background in biology, forestry, and natural resources and for those without such background. The curriculum is designed for fall admission, but spring semester admission is possible. More than four semesters may be required for students from non-science backgrounds who need additional basic undergraduate coursework as part of their program of study.

Transfer Credit

Up to six (6) credits of appropriate graduate-level coursework **not used to complete any other degree** may be accepted toward completion of a master's degree via a petition. To clarify, a student may not transfer any graduate coursework earned as part of a conferred master's degree toward an ESF master's degree. Students may also transfer up to nine (9) credits of credit-bearing graduate-level **non-degree ESF** coursework (e.g., credit-bearing graduate coursework taken as a non-matriculated ESF student) toward a master's degree (no petition required). Credit hours appropriate to the graduate degree in which a minimum grade of B was earned from any accredited institution can be transferred to the college, but grades and grade points cannot be transferred. Thesis and Research credits do not transfer. All transfer credits will remain tentative until official, final transcripts are received. All transfer credits must be approved first by the steering committee and then by the Graduate Program Director.

Steering Committee

In consultation with your major professor (MP), you will create a steering committee that provides advice about your coursework, research and other aspects of the program. The steering committee is composed of your MP, designated in via your application and stated admission letter, and at least one other faculty member or other qualified person with a degree equivalent to the one being conferred or with equivalent professional experience. A new MP, different from the one initially designated, can be assigned upon submitting Form 2A (<http://www.esf.edu/efb/graduate/forms.htm>). Two co-MPs count as two committee members, but adding another qualified person is allowed. You, in consultation with your MP, choose who will be on your steering committee during the first semester. The full committee must have met by the end of the third semester of graduate study.

To have your steering committee officially assigned, you must submit Form 2A (Request for Steering Committee), obtained from at <http://www.esf.edu/efb/graduate/forms.htm>. This form must be signed by the Graduate Director and recorded by Danielle Kavanagh, EB's Graduate Administrative Assistant, prior to submission to the Graduate School.

As a graduate student, you are responsible and accountable for your progress. You should meet at least once a year with your steering committee, but frequent informal meetings with your MP and individual committee members are strongly encouraged.

Coursework Requirements and Guidelines

The Master of Professional Studies degree requires graduate coursework credits. Depending on the area of study, students may complete the MPS degree with coursework only (coursework option) or a combination of coursework and professional experience/internship (professional experience option). The MPS degree is designed to accommodate a great breadth of student goals and needs, including students desiring additional education following some experience in their field, and science teachers seeking a master's degree for permanent certification. As in all degree programs in EB, the student will be guided through the MPS program by the steering committee.

Professional Experience Option for the following areas of study: chemical ecology, conservation biology, ecology, entomology, environmental interpretation, environmental physiology, fish and wildlife biology and management, forest pathology and mycology, or plant science and biotechnology: In addition to an internship (EFB 898) earning 6–12 credits, this option requires at least 30 credits of graduate coursework, of which 24 must be taken in residence at ESF. At least 36 credits must be earned between internship and coursework. Coursework for this option includes at least two seminars (EFB 797) and a maximum of three credits earned in EFB 798. The steering committee must approve a high-quality written report reflecting the breadth and depth of the internship (usually 20–30 pgs, including tables and figures) or a professional product, e.g., an article in a magazine. Be sure to discuss details with your steering committee. A capstone seminar is required and is followed by a final committee meeting to discuss concerns from the capstone and revisions to the capstone report. For students completing the concurrent degree program (MPS/MS) leading to certification in biology (Grades 7–12), the capstone and final meeting are still required, but 12 credits of student teaching and coursework will be accepted as equivalent to a professional experience.

Coursework Option for the following areas of study: chemical ecology, conservation biology, ecology, entomology, environmental interpretation, environmental physiology, fish and wildlife biology and management, forest pathology and mycology, or plant science and biotechnology. At least 30 of the 42 credits required must be taken in residence at ESF. Coursework in this option must include three seminars (EFB 797 or equivalent in other departments or Syracuse University or Upstate Medical University). EFB 798 or 898 can be taken but with a maximum of six credits. Neither a final report nor a capstone seminar with final meeting is required.

Coursework Option for the area of study in applied ecology: Coursework requirements include three credits each from five of the seven focus areas, two seminars (EFB 797) and additional 19 credits of graduate coursework for a total of 36 credits. Neither a comprehensive examination nor a capstone seminar is required.

Coursework Option for the area of study in plant biotechnology: Coursework requirements consist of 19 credits of core coursework including two seminars (EFB 797), nine credits of directed electives and eight credits of open electives for a total of 36 credits. Neither a comprehensive examination nor a capstone seminar is required.

Student Study Plan

After forming your steering committee, you must fill out Form 3B: Program of Study (available at <http://www.esf.edu/efb/graduate/forms.htm>). This form must be signed by your MP, all of the members of your steering committee, and the Graduate Director (note that electronic signatures as well as signed forms sent electronically to the Graduate Director are acceptable). This form must be completed by the end of the first year of the program. The EB Graduate Administrative Assistant, records the form and forwards it to the Graduate School for approval. Once approved, Form 3B serves

as an institutional endorsement of your graduate program of study and protects you by officially stating what courses you will complete and when you will complete them. Changes to Form 3B are done with Form 4 (signed by your MP, all of the members of your steering committee, and the Graduate Program Director) sent to the EB Graduate Administrative Assistant. If the Graduate Director is not comfortable with coursework designated on the 3B form, the Department Chair will be consulted, and the form may be remanded to GPAC for review and recommendations. Note the section regarding “Research Tool(s)” and “Communication Skills” may be required by the Steering Committee, but generally these are acquired through the approved coursework.

Credit Hours

MPS students should register for 12 credit hours per semester to be considered full time. You are allowed to drop to 1 credit hour of professional experience or independent study your last semester as long as you have completed all academic requirements. To do so, you must complete and have your MP sign the Certification of Full-Time Status for Graduate Studies form.

Capstone

MPS students going the route of professional experience option must present a capstone seminar on their internship. You will need to coordinate a time, date, and location of your capstone with your MP and steering committee member. You will need to develop and send a flyer with your capstone information to the EB Graduate Administrative Assistant, who will print and post copies and send an email to campus. You should also post capstone information to the main [ESF calendar of events](#). Capstones will not be scheduled with less than two weeks notice.

MPS Suggested Timeline

Step	Procedure & Forms*	Responsibility	Target date	Date done
1.	Decide upon general area of study.	Student (in consultation w/ MP)	First semester or before	__/__/__
2.	Propose steering committee (Form 2A) through Graduate Director (GD) to Office of Instruction and Graduate Studies (OIGS).	Student (in consultation w/ MP)	First semester	__/__/__
3.	Student and steering committee determine appropriate coursework. Student completes Form 3B and “MPS Course List” form. Student, MP, and steering committee sign form (which must be approved by GD and OIGS).	Student	First semester	__/__/__
4.	Meet with steering committee to review study plan (and if necessary, revise Form 3B).	Student	Second semester	__/__/__
5.	Schedule capstone date with committee and notify Dept Graduate Administrative Assistant (Professional Experience option only)	Student	After MP approves paper draft	__/__/__
6.	Submit capstone paper in final form to committee (Professional Experience option)	Student	14 days before scheduled capstone	__/__/__
7.	Submit paper and present capstone (Professional Experience option)	Student	Before graduation	__/__/__
8.	Certify completion of all requirements (Form 9, through GD to OIGS)	Major Professor	Before graduation	__/__/__

* Use Environmental Biology specific forms available at <http://www.esf.edu/efb/graduate/forms.htm>

V. MASTER OF SCIENCE

The Master of Science (MS) program enables students to integrate knowledge and expertise drawn from both the natural and social sciences, and to research issues and apply their knowledge to solve practical problems in Environmental Biology. The primary focus of the program is to provide an opportunity for graduates coming from related academic backgrounds with baccalaureates to gain experience conducting a scientific research project in environmental and forest biology. Graduates will successfully function as researchers and managers on multi-disciplinary teams and respond to the challenges related to the sustainable management of local, regional and global resources.

Transfer Credit

Up to six credits of appropriate graduate coursework **not used to complete any other graduate degree** may be accepted toward completion of a master's degree via a petition. To clarify, a student may not transfer any graduate coursework earned as part of a conferred master's degree toward an ESF master's degree. Students may also transfer up to nine credits of credit-bearing **non-degree ESF** graduate coursework (e.g., credit-bearing graduate coursework taken as a non-matriculated ESF student) toward a master's degree (no petition required) as approved by your Steering Committee and Graduate Director via form 3B. Credit hours appropriate to the graduate degree in which a minimum grade of B was earned from an accredited institution can be transferred to the college, but grades and grade points cannot be transferred. Thesis and Research credits do not transfer. All transfer credit will remain tentative until official, final transcripts are received

Steering Committee

You will have a steering committee that provides advice about your coursework and other aspects of the program. MS students must have a minimum of a major professor (MP) and two steering committee members. The steering committee is composed of the MP, who is assigned to the student at admission, and at least two other faculty members or other qualified persons with a degree equivalent to the one being conferred or with equivalent professional experience. A new MP, different from the original one assigned, can be assigned by submitting a new Form 2A (available at <http://www.esf.edu/efb/graduate/forms.htm>). Two co-MPs count as two committee members. You, in consultation with your MP, should endeavor to choose your steering committee members during the first semester and at the latest before initiating research. The full committee must have met by the end of the third semester of graduate study.

To have your steering committee assigned, you must submit Form 2A Steering Committee (available at <http://www.esf.edu/efb/graduate/forms.htm>). This form must be signed by the Graduate Director and recorded by the Graduate Administrative Assistant.

As a graduate student, you are responsible and accountable for your progress. You should meet at least once a year with your steering committee, but frequent informal meetings with your major professor and individual committee members are strongly encouraged. Keeping committee members abreast of your research plans and results can head off potential problems before they occur.

Coursework Requirements and Guidelines

The MS degree requires a minimum of 30 total graduate credit hours. At least 18 credits of graduate coursework are required with three of these credits being topical seminars (EFB 797 or equivalent in other departments or Syracuse University or Upstate Medical University). MS students must also complete at least six credit hours of thesis research (EFB 899: Master's Thesis). Concurrent degree

students may “double-count” 12 credit hours toward their MS degree. These general graduate requirements are set by the College (see the College Catalog, available at www.esf.edu/catalog).

Students develop programs of study to satisfy their coursework requirement in consultation with their MP and steering committee. Coursework should provide a coherent body of theory, a set of appropriate methods to test that theory, and should focus on an important area of application beyond the specific work done for the graduate degree.

Student Study Plan

After forming your steering committee, you must fill out Form 3B: Program of Study (available at <http://www.esf.edu/efb/graduate/forms.htm>). This form must be signed by your MP, all of the members of your steering committee, and the Graduate Director (note that electronic signatures as well as signed forms sent electronically to the Graduate Director are acceptable). This form must be completed by the end of the first year of the program. The EB Graduate Administrative Assistant, records the form and forwards it to the Graduate School for approval. Once approved, Form 3B serves as an institutional endorsement of your graduate program of study and protects you by officially stating what courses you will complete and when you will complete them. Changes to Form 3B are done with Form 4 (signed by your MP, all of the members of your steering committee, and the Graduate Program Director) sent to the Graduate Administrative Assistant. If the Graduate Director is not comfortable with coursework designated on the 3B form, the Department Chair will be consulted, and the form may be remanded to GPAC for review and recommendations. Note the section regarding “Research Tool(s)” and “Communication Skills” may be required by the Steering Committee, but generally these are acquired through the approved coursework.

Research Proposal

All students are required to write a formal research proposal documenting your plan for thesis work. This should be done early in a student’s program to allow for revision. The proposal should be given to your MP and each member of your steering committee to solicit constructive criticism. As the proposal is revised, copies should again be provided to all committee members. Your proposal should include: 1) a description of the study problem (significance and rationale), 2) goals and objectives for solving that problem, 3) a literature review discussing our current knowledge of the problem, 4) conceptual framework (theory and hypotheses) for the pursuit of new knowledge, 5) detailed methods for achieving the objectives and testing the hypotheses, and 6) a timetable of tasks by quarter.

Credit Hours

Students on GAs and RAs should register for at least 9 credit hours per semester to be considered full time, otherwise 12 credit hours are required. You are allowed to drop to 1 credit hour of thesis research, professional experience, or independent study your last semester of your MS as long as you have completed all academic requirements. To do so, you must complete and have your MP sign the Certification of Full-Time Status for Graduate Studies form.

Thesis

The culminating focal point of MS graduate study is the thesis. A thesis is a document that clearly demonstrates your graduate level scholarly research. It details the results and interpretation of your scholarly endeavors and is the subject of the thesis defense. The MS thesis should demonstrate that the student has: 1) a core understanding of the state of knowledge in the field of study, 2) working knowledge of the scientific method, and 3) makes an original and substantive contribution to the student’s chosen field of research.

Basic instructions on formatting your thesis can be found on the [Graduate website](#). EB MS graduate students are encouraged to use the manuscript style for their thesis. A manuscript-style thesis includes one or more scholarly manuscripts written in a manner suitable for publication in appropriate venues. This type of thesis allows a student to prepare and present their graduate research work in a format that facilitates publication. Manuscript-style chapters are often preceded by a literature review, which contributes chapter introductions, and a conclusion chapter with lessons learned and recommendations for future research. Graduates and their MP(s)/steering committee decide how many chapters and if preceding and concluding chapters are appropriate.

Capstone

All MS students must present a capstone seminar on their thesis work. You will need to coordinate a time, date, and location of your capstone with your MP, steering committee members, and defense Chair. You will need to develop and send a flyer with your capstone information to the EB Graduate Administrative Assistant, who will print and post copies and send an email to campus. You should also post capstone information to the main [ESF calendar of events](#). Capstones will not be scheduled with less than two weeks notice.

Thesis Defense Examination

The thesis defense examination is conducted by your steering committee (major professor and two steering committee members) and one additional examiner*, for a minimum total examining committee of four (4) persons. In addition, the Dean of Instruction and Graduate Studies appoints a faculty member from outside EB to supervise the examination and to uphold the standards of the College and represent the interests of the student. Students must fill out Form 5B: Request to Appoint Defense of Thesis/Dissertation Examination Committee (available at <http://www.esf.edu/efb/graduate/forms.htm>) to appoint a thesis examination committee. When OIGS receives the signed form, a chair will be appointed for the defense. You will then receive Form 5C, which officially appoints your committee, at which time you need to contact all members of the committee, including the chair, to schedule your defense.

The student is responsible for working with their MP, OIGS, and all examining committee members to plan the examination and meet all deadlines for delivery of materials. Form 5B should be submitted to OIGS at least one month prior to the anticipated defense date. The student must inform OIGS of the agreed upon date, time, and location for the defense at least two weeks in advance of the defense date.

A final draft of the thesis must be delivered to each member of the Defense Committee, including the Chair, at least 14 days prior to the scheduled defense date.

The student examinee may invite a silent student observer to attend the oral examination with notification to their MP and the chair of the examination committee. Any member of the faculty may be an observer during a thesis defense. The defense examination usually lasts 2 hours, although this time period may be extended as needed. At the completion of the examination, the candidate and observers are excused, and the examination committee determines whether the candidate has successfully defended the thesis. The committee chair has the option to vote. Unanimous agreement is required to pass the student. If less than unanimous agreement is reached, the student is considered to have failed the first defense examination. A student who fails the first defense may request a second defense, which must take place no more than one year from the date of the first examination. At the second

**The examiner is chosen by the student and MP. The examiner can be a faculty member at ESF or another institution, or other qualified person with a degree equivalent to the one being conferred, or with equivalent professional experience. Note the examiner can be added when the 5B is filed or they can be a part of the committee from the outset.*

defense, the student has passed the defense if there is not more than one negative vote. A student who has failed the second defense is terminated from the graduate program.

Expectation of Publication: MS students are encouraged to have at least one publishable manuscript from their thesis research, ideally already submitted to a peer-reviewed journal.

MS Suggested Timeline

Step	Procedure & Forms*	Responsibility	Target Date	Date Done
1.	Decide upon general area of study	Student (in consultation with MP)	First semester or before	__/__/__
2.	Propose steering committee (Form 2A) through Graduate Director (GD) to Office of Instruction and Graduate Studies (OIGS). Prepare detailed proposal for thesis research and complete/return a Thesis or Dissertation Proposal Approval Form OIGS.	Student (in consultation with MP)	First semester	__/__/__
3.	Meet with MP & steering committee to review research proposal. Complete Research Proposal Approval form: cc EB GS as sent to OIGS.	Student	Second semester	__/__/__
4.	Student and steering committee determine appropriate coursework (Form 3B through GD to OIGS).	Student	First semester (spring start) Second semester (fall start)	__/__/__
5.	Meet with steering committee to review study plan (and if necessary, revise Form 3B) and present research results.	Student	Second semester	__/__/__
6.	Submit thesis to MP for review. Recruit an Examiner to the committee.	Student	Before final semester	__/__/__
7.	Request appointment of defense and committee chair (Form 5B through GD to OIGS)	Student	Beginning of final semester	__/__/__
8.	Schedule defense date with committee (including committee chair) and notify OIGS	Student	At least one (1) month before proposed defense date	__/__/__
9.	Submit thesis in final form to defense committee	Student	After MP approves draft thesis	__/__/__
11.	Send Capstone Seminar flyer to GAA for dissemination and post to campus calendar.	Student	Fourteen (14) days before scheduled defense date	__/__/__
10.	Present Capstone Seminar	Student	2 wks before defense	__/__/__
12.	Defend thesis (Form 5E to OIGS)	Student	Prior to defense	__/__/__
13.	Submit corrected thesis and abstract to MP, defense chair, and EFB Chair for final approval and signing	Committee chair	Date of defense	__/__/__
14.	Submit copies of thesis to OIGS for signatures and binding	Student	As scheduled at defense	__/__/__
15.	Certify completion of all requirements (Form 9 through GD to OIGS)	Student	Before graduation	__/__/__
16.		Major Professor	Before graduation	__/__/__

* Use Environmental Biology specific forms available at <http://www.esf.edu/efb/graduate/forms.htm>

VI. DOCTOR OF PHILOSOPHY

The Doctor of Philosophy (PhD) graduate degree program enables students to extend knowledge and expertise from their natural and social science background in their baccalaureate and masters degrees. The primary focus of the program is to provide an opportunity for graduates coming from diverse academic backgrounds to gain a science-based education in environmental and forest biology and to contribute new knowledge to society. Graduates will successfully function as researchers, educators, administrators, managers, and consultants and respond to the challenges related to the sustainable management of local, regional and global resources.

Transfer Credit

Up to six credits of appropriate graduate coursework **not used to complete any other graduate degree** may be accepted toward completion of a doctoral degree via petition. Students may also transfer up to nine credits of credit-bearing **non-degree ESF** graduate coursework (e.g., credit-bearing graduate coursework taken as a non-matriculated ESF student) toward a doctoral degree (no petition required). Up to 30 credits of graduate level coursework **earned as part of a conferred master's degree** may be transferred toward your doctoral degree. All three types of transfer credits must be approved by your steering committee and Graduate Program Director via Form 3B.

Credit hours appropriate to the graduate degree in which a minimum grade of B was earned from an accredited institution can be transferred to the college, but grades and grade points cannot be transferred. Thesis and Research credits do not transfer. All transfer credit will remain tentative until official, final transcripts are received.

Steering Committee

You will have a steering committee that provides advice about your coursework and other aspects of the program. Doctoral students must have a minimum of a major professor (MP) and at least two other faculty members or other qualified persons with a degree equivalent to the one being conferred or with equivalent professional experience. A new MP, different from the assigned, can be requested by submitting a new Form 2A (available at <http://www.esf.edu/efb/graduate/forms.htm>). Two co-MPs count as two committee members. You, in consultation with your MP(s), choose who will be on your steering committee during your first or second semester and at the latest, before research is initiated. The full committee must have met by the end of the third semester of graduate study.

To have your steering committee assigned, you must submit Form 2A Steering Committee (available at <http://www.esf.edu/efb/graduate/forms.htm>). This form must be signed by the Graduate Director and recorded by the EB Graduate Administrative Assistant.

As a graduate student, you are responsible and accountable for your progress. You should meet at least once a year with your steering committee, but regular informal meetings with your MP(s) and individual committee members are strongly encouraged.

Coursework Requirements and Guidelines

The PhD degree requires a minimum of 60 total graduate credit hours. At least 30 credit hours in graduate coursework are required. PhD students must complete at least 12 credit hours of thesis research (EFB 999: Doctoral Dissertation) and must take 5 topical seminars (EFB 797 or equivalent in other departments or Syracuse University and Upstate Medical University). PhD students with previous MS degrees may transfer 2 seminars (maximum) as part of the 30 course work credits and thus, will only need to take three new seminars. Concurrent degree students may “double-count” 12 credit hours toward their PhD degree. These general graduate requirements are set by the College (see the College Catalog: www.esf.edu/catalog). Students develop programs of study to satisfy their

coursework requirement in consultation with their MP(s) and steering committee. Coursework should provide a coherent body of theory, a set of appropriate methods to test that theory, and should focus on an important area of application beyond the specific work done for the degree.

Student Study Plan

After forming your steering committee, you must fill out Form 3B: Program of Study (available at <http://www.esf.edu/efb/graduate/forms.htm>). This form must be signed by your MP(s), all of the members of your steering committee, and the Graduate Director (note that electronic signatures as well as signed forms sent electronically to the Graduate Director are acceptable). This form must be completed by the end of the first year of the program. The Graduate Administrative Assistant, records the form and forwards it to the Graduate School for approval. Once approved, Form 3B serves as an institutional endorsement of your graduate program of study and protects you by officially stating what courses you will complete and when you will complete them. Changes to Form 3B are done with Form 4 (signed by your MP(s), all of the members of your steering committee, and the Graduate Program Director) sent to the Graduate Administrative Assistant. If the Graduate Director is not comfortable with coursework designated on the 3B form, the Department Chair will be consulted, and the form may be remanded to GPAC for review and recommendations. Note the section regarding “Research Tool(s)” and “Communication Skills” may be required by the Steering Committee, but generally these are acquired through the approved coursework.

Dissertation Research Proposal

Before your research is very far underway, you must write a research proposal documenting your plan for dissertation work. The proposal should be given to your major professor and each member of your steering committee. As the proposal and plan are revised, copies should again be provided to all committee members. Your proposal should include: 1) a description of the study problem (significance and rationale), 2) goals and objectives for solving that problem, 3) a literature review discussing our current knowledge of the problem, 4) conceptual framework (theory and hypotheses) for the pursuit of new knowledge, and 5) detailed methods for achieving the objectives and testing the hypotheses.

Doctoral Candidacy Examination

Objectives of this examination are to determine the breadth and depth of your knowledge in the chosen field of study and assess your understanding of the scientific process. The doctoral candidacy examination is taken when the majority of coursework is completed and no more than three years from the first date of matriculation has elapsed or the student may be dismissed from the doctoral program. This examination must be taken at least one year prior to the dissertation defense. The examination consists of both written and oral components.

To initiate the doctoral candidacy examination process, the following steps must be completed:

1. In consultation with your MP(s), Form 6B must be completed for the Graduate Director to review, sign, and forward to the Office of Instruction and Graduate Studies (OIGS) (<http://www.esf.edu/efb/graduate/forms.htm>). This form indicates the addition of an examiner* to the committee for the examination (a minimum of four examiners are required for a doctoral candidacy examination). Form 6B should be submitted according to the academic year deadlines for defense exams (<http://www.esf.edu/graduate/deadlines.htm>).

**The examiner is chosen by the student and MP. The examiner must be a faculty member at ESF or another institution, or other qualified person with a degree equivalent to the one being conferred, or with equivalent professional experience. Note the examiner can be added when the 5B is filed or they can be a part of the committee from the outset.*

2. OIGS will generate Form 6C officially appointing the examination committee. This form will indicate assignment of an ESF faculty member from another Department by OIGS, whose role is to manage the examination, ensure its integrity and represent the standards of the College and the interests of the student. You should contact all committee members (MP(s), steering committee, additional examiner, and defense chair) to arrange a mutually convenient date, time, and location for a planning meeting.
3. You must inform the OIGS of the agreed upon date, time, and location for the planning meeting at least two weeks in advance of the date. OIGS will confirm these arrangements with all concerned individuals via Form 6D.
4. During the first part of the planning meeting, you and your committee members determine the format for the written process and establish dates for the written as well as the oral component. You are then excused from the meeting and the committee develops and discusses the exam content. At least 1–2 weeks, should separate the written and oral components.

The exam chair completes Form 6E outlining clearly how the examination will be administered and returns it to OIGS, which will distribute copies to you and the committee. The student may invite a silent student observer to attend the oral examination with notification to their major professor as well as the chair of the exam committee.

Written Examination: The committee must decide on *one* of the two following options for the written component in EB:

1. Option 1: Committee members submit questions or problems addressing objectives of the exam. Topic areas for questions are discussed and agreed upon at the planning meeting. The MP administers the written examination – usually one day is allocated to questions submitted by each examiner (exact time and format to be decided at the planning meeting, which can differ for each committee member). Upon completion, examination questions are reviewed by the committee members who prepared them and feedback provided to the MP. The MP collates questions and feedback and submits to the full committee for review of the entire written examination. Feedback from committee members may be provided to the student; this will be decided at the planning meeting.
2. Option 2: The student prepares a full research proposal on a topic assigned by the examining committee. The topic must meet the objectives of this examination and its content cannot be directly related to the student’s thesis research. The student has approximately one month to develop a thorough understanding of the assigned topic and prepare a written proposal. The proposal is reviewed by the committee members and committee chair and feedback provided and summarized by the MP. At a minimum the research proposal should follow NSF (https://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg), NIH, <https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/write-your-application.htm>), or similar rigorous proposal guidelines. The proposal is evaluated by the committee members and committee chair for completeness, quality, and likelihood of getting funded (generally following the criteria followed by NSF/NIH reviewers). Feedback from committee members may be provided to the student; this will be decided at the planning meeting.

Oral Examination:

Upon successful completion of the written component of the exam the major professor will notify the committee that the oral component can proceed. Any member of the faculty may be an observer at the oral examination. The oral exam generally lasts two hours; however, the duration can be longer if required. At the end of the oral examination, the committee asks the student and observers to leave the room while it determines satisfactory completion of the doctoral candidacy exam. You will be invited back to receive the decision of the committee which will also be reported on Form 6F and returned by the exam chair to OIGS.

Credit Hours

Students on GAs and RAs should register for at least 9 credit hours per semester to be considered full time, otherwise 12 credit hours are required. You are allowed to drop to 1 credit hour of dissertation research after successfully passing the Candidacy Exam as long as you have completed all academic requirements. To do so, you must complete and have your MP sign the Certification of Full-Time Status for Graduate Studies form – note: this form has to be done every semester until completion.

Dissertation

A focal point of doctoral graduate study is the dissertation. A dissertation is a document that clearly demonstrates your graduate level accomplishments. It details the results of your scholarly endeavor and is the subject of the dissertation defense. The dissertation defense must take place no less than one (1) year, and no more than three (3) years, after the candidacy examination. This is an important point that requires some planning on your part.

A PhD dissertation is different from an MS thesis in the depth and breadth of performance demonstrated. A PhD dissertation should portray that the student has: 1) a complete understanding of the state of knowledge in the field of study, 2) conducted a research program at a conceptual level, often demonstrated by the reformulation or creation of theories with new knowledge developed as original work through the formulation and testing of hypotheses, and (3) demonstrated skills in research tool use (e.g., statistics) and methods. Dissertations that fulfill these aspects should lead to a number of peer-reviewed journal articles.

Basic instructions on formatting your dissertation can be found on the [Graduate website](#). EB MS graduate students are encouraged to use the manuscript style for their thesis. A manuscript-style dissertation includes multiple scholarly manuscripts written in a manner suitable for publication in appropriate venues. This type of dissertation allows a student to prepare and present their graduate research work in a format that facilitates publication. Manuscript-style chapters are often preceded by a literature review, which contributes chapter introductions, and a conclusion chapter with lessons learned and recommendations for future research. Graduates and their MP(s)/steering committee decide number of chapters and if preceding and concluding chapters are appropriate.

Capstone

All PhD students must present a capstone seminar on their dissertation research. You will need to coordinate a time, date, and location of your capstone with your MP, steering committee members, examiners, and defense Chair. You will need to develop and send a flyer with your capstone information to Ms. Kavanagh, the EB Graduate Administrative Assistant, who will print and post copies and send an email to campus. You should also post capstone information to the main [ESF calendar of events](#). Capstones will not be scheduled with less than two weeks notice.

Dissertation Defense Examination

The dissertation defense is conducted by the steering committee and two or more additional examiners (a minimum total examining committee of five persons). The last examiner, a faculty member or other qualified person with a degree equivalent to the one being conferred (or with equivalent professional experience), is added via Form 5B: Request to Appoint Defense of Thesis/Dissertation Examination Committee (available at <http://www.esf.edu/efb/graduate/forms.htm>). In addition, OIGS will appoint a faculty member from a department outside EB to supervise the examination. The role of the examination committee chair is to manage the defense, ensure its integrity, and represent the standards of the faculty and the interests of the student. *Note: the Defense Chair will not be the same Chair as the one assigned by OIGS for the Candidacy Exam.* You will then receive Form 5C from OIGS, which officially appoints your committee, at which time you need to contact all members of the committee, including the chair, to schedule your dissertation defense.

The student is responsible for working with the major professor, OIGS, and all examining committee members to plan the examination and meet all deadlines for delivery of materials. Form 5B should be submitted to the OIGS at least one month prior to the anticipated defense date. The student must inform OIGS of the agreed upon date, time, and location for the defense at least 2 weeks in advance of the defense date.

A final draft of the dissertation must be delivered to each member of the defense committee, including the chair, at least 14 days prior to the scheduled defense date. Within three days of the oral exam, the major professor confirms with the chair of the examining committee that the oral examination should proceed as scheduled. If the MP determines the written document does not meet standards established for the dissertation exam, the exam may be postponed by the Dean of the Graduate School at the recommendation of the Chair of the student's exam committee.

Any member of the faculty may be an observer at the dissertation defense. The student examinee may invite a silent student observer to attend the examination with notification to their MP and to the chair of the student's exam committee. The defense examination usually lasts 2 hours, although this time period may be extended as needed. At the completion of the examination, the candidate and observers are excused and the examination committee determines whether the candidate has successfully defended the dissertation. The committee chair has the option to vote. Unanimous agreement is required to pass the student. If less than unanimous agreement is reached, the student is considered to have failed the first defense examination. A student who fails the first defense may request a second defense, which must take place no more than one year from the date of the first examination. At the second defense, the student has passed the defense if there is not more than one negative vote. A student who has failed the second defense is terminated from the graduate program.

Additional Teaching and Publication Expectations

Teaching: PhD students are encouraged to facilitate a seminar course during their time at ESF.

Publications: PhD students are expected to have contributed new knowledge to their field as evidenced in three to four publishable chapters from their dissertation research. At least one manuscript accepted into a peer reviewed journal prior to defending is encouraged.

PhD Suggested Timeline

Step	Procedure & Forms*	Responsibility	Target Date	Date Done
1.	Decide upon general area of study.	Student (in consultation with MP)	First semester or before	__/__/__
2.	Propose steering committee (Form 2A) through Graduate Director (GD) to Office of Instruction and Graduate Studies (OIGS).	Student (in consultation with MP)	First/second semester	__/__/__
3.	Meet with MP and steering committee to determine appropriate coursework (3B through GD to OIGS).	Student	Before starting research	__/__/__
4.	Prepare detailed proposal for dissertation research and complete/return a Thesis or Dissertation Proposal Approval Form OIGS – cc EB GS.	Student	First/second year	__/__/__
5.	Meet with MP & steering committee to review research proposal. Complete Research Proposal Approval form.	Student (in consultation with MP & steering committee)	First/second year	__/__/__
6.	Meet with steering committee to review study plan (and if necessary, revise Form 3B) and present preliminary research results. Discuss candidacy exam.	Student	End of second year	__/__/__
7.	Add Examiner and request appointment of doctoral candidacy examination Chair (Form 6B through GD to OIGS).	Student	End of second year, beginning of third	__/__/__
8.	Arrange a planning meeting with the full committee (including chair) – inform OIGS	Student (in consultation with MP)	At least 4 wks before proposed exam date	__/__/__
9.	Meet with full committee to arrange written and oral components of the candidacy exam (Form 6E to OIGS).			__/__/__
10.	Complete candidacy exam (Form 6F) to OIGS.	Committee Chair	Minimum of 1 yr prior to dissertation defense	__/__/__
11.	Add a 2 nd Examiner and request appointment of Defense Chair (Form 5B through GD to OIGS).	Student	At least 6 wks prior to dissertation defense	__/__/__
12.	Schedule defense and make room reservation for Capstone and defense.	Student	At least 5 wks prior to defense	__/__/__
13.	Submit full draft of dissertation to MP for review	Student	At least 4 wks prior to defense	__/__/__
14.	Submit dissertation to Steering Committee.	Student	After MP approval and 14 days prior to defense	__/__/__
15.	Send Capstone Seminar flyer to Graduate Administrative Assistant for dissemination and post to campus calendar.	Student	2 wks before defense	__/__/__
16.	Defend dissertation (Form 5E to OIGS).	Committee Chair	Date of defense	__/__/__
17.	Submit corrected dissertation and abstract to MP & Departmental Chair for final approval and signing.	Student	As scheduled	__/__/__
18.	Submit copies of dissertation to OIGS for signature and binding.	Student	Before graduation	__/__/__
19.	Certify completion of all requirements (Form 9, through GD to OIGS).	Student	Before graduation	__/__/__

* Use Environmental Biology specific forms available at <http://www.esf.edu/efb/graduate/forms.htm>

Appendix A: Example of Graduate and Post-Doctoral Program Expectations¹

Between Major Professor and graduate student/post-doctoral researcher

Graduate and post-graduate work is a mutual investment in the process of learning, personal growth, empowerment and producing peer-reviewed science. It is accomplished through the joint efforts of the advisor and the graduate student or post-doc. Like most relationships, it requires hard work, good communication and mutual respect. Most students, particularly MS students, do not know what is expected of them. The following are evolving (and potentially changing) expectations and responsibilities that are meant to be informative and to serve as a guide to (y)our journey.

Data publication, ownership, and collaborations

EB's philosophy is that science progresses by building on and adding to a foundation of knowledge. Therefore, it is important that graduate students be well versed in the literature that is already available and that you contribute to that knowledge base by publishing. In general, 1–2 publications are expected from a M.S student, 3+ from a Ph.D., and 1–2/yr from a Post-doctoral fellow, depending on the project.

Conducting research includes various steps: (1) Coming up with and refining research questions and ideas, (2) developing ways to test your ideas, (3) writing a research proposal, (4) administering finances to conduct your research, (5) conducting the research, (6) trouble-shooting research due to logistics/unforeseen problems, (7) providing logistical support for the field/lab work, (8) analyzing the data, (9) writing up the data for publication. Involvement in these steps may occur by various persons to various degrees. For example, a M.S. student might be given an idea by their MP and be helped considerably in the remaining steps. Usually, the MP raises the bulk of the funding to do the research and may deal with many of the logistical dealings with agencies. Ph.D. and post docs would be more independent in the development of ideas, field and lab logistics, seeking funding, and analysis of the data, but are expected to maintain good communication with the MP nonetheless.

In discussions of publication, the main priority is to get the data published because there is little point in doing the research if the resulting knowledge it is not made widely available to society. Some funding agencies require publication as part of a binding contract, while other agencies (e.g., NSF) will no longer provide future funding if research is not published. As the holder of the grants in your lab, your MP is legally, professionally, and morally responsible to make sure the data are published. As a result, here are guidelines for research conducted in EB.

- A copy of all data collected (electronic files, scans/copies of lab books) should be given to your MP at regular intervals (e.g., the end of each field season, end of an experiment, monthly, each semester, etc.) along with a key that explains the data (variables, codes, units of measure) and a map of study site locations. This provides you with a safe back-up and your MP with a copy in case something happens to you. At the end of the project, your MP will need a full version of organized and documented data for the project prior to my signing off on the thesis.
- If a students or post-docs project is not written up within one year of the thesis defense, or a PhD/postdocs leaving, your MP reserves the right to publish the data/thesis with the student as the co-author. Order of authorship will be decided based on consultation.

¹ **This is an example only – not all MPs have (or want to have) one of these.** This material has been adapted over several semesters in the EB graduate Core Course facilitated by M. Fierke. It was adapted from a contract J. Frair signed with her Ph.D. advisor, E. Merrill at the University of Alberta. That was in turn adapted from materials developed by Susan Hannon. Whether this document originated entirely with Susan or was handed down through her academic forefathers is unknown. Regardless, these materials have been vetted by highly respected researchers with proven track records in successful graduate student mentoring.

- If the student does not defend a thesis, your MP has the right to publish the data one year after the student leaves if no action has been taken by the student to publish the data (i.e. they would need to see drafts of a manuscript showing you are progressing towards publication).
- The following guidelines for authorship hold:
 - You should discuss with your MP any research/paper collaborations you participate in while you are in my lab early (preferably discuss this with me prior to your commitment). This is to ensure it will not be detrimental to the student's degree progress and any associated agreements.
 - If your MP or others have had no input in steps 1-9 above, then the student/postdoc can be sole author.
 - Paid technicians and volunteers should not expect to be authors unless expressly agreed upon by the lab supervisor and/or students at the beginning of the project. They will, however, be acknowledged in the manuscript.
 - If the student has had input from their MP or other key individuals on several of the above steps, your MP would expect these persons to be given the opportunity to be included in the authorship: *right of first refusal*. With acceptance of authorship, comes the expectation to provide considerable, constructive feedback on manuscript drafts.
 - In some cases, data will be requested from students/postdocs for uses other than theses and manuscripts, e.g., presentations at professional meetings, and authorship on the presentations will be given.
 - In most cases, your MP would expect to be a secondary author on student papers; however if your MP has to substantially reanalyze and rewrite the paper; the order of authorship would need to be discussed.
 - Your MP expects to be able to use the data collected by students in their lab for purposes other than those outlined in theses. The student will be notified and offered the first right of refusal on authorship.

When working on collaborative/group projects, authorship should be discussed and agreed to *at the beginning* of the project and agreed to *in writing* so there is no disagreement later. Additionally, over time the data you collect may be used for an overview paper, to explore analytical and statistical techniques, or a different purpose. You will be contacted and your participation in the paper discussed.

Sometimes students see the professor/student relationship as an exploitative one and tend to overemphasize their own contributions ("I did all the field/lab work") without realizing that field/lab work is only one of the steps outlined above and that research must be a collaborative endeavor because of the diversity of efforts involved. A collaborative approach is encouraged for both research and publication so that all students in a lab are engaged and helping each other. If you see your involvement otherwise, make this known to your MP at the time of your proposal or a collaborative approach will be assumed and expected.

General Lab Policies:

- Lab camaraderie is encouraged and expected. New students should consult with more experienced lab mates for advice and help with navigating their way through graduate school, on lab policies and requirements, as well as lab and field techniques (i.e. let's not reinvent the wheel and waste time when we can stand on the shoulders of giants). Students should be supportive and willing to help out on lab research and provide critical and constructive feedback on written materials.
- Students are responsible for planning ahead, writing and submitting abstracts on time, registering for conferences, reserving hotel rooms, submitting paperwork for travel advances and obtaining and submitting financial receipts to our departmental office administrator for reimbursements.

- Students and their employees should not expect food allowances while conducting research, except while at conferences where they are presenting their research.
- Students should educate themselves about general financial protocols in securing supplies/equipment /services, getting reimbursed, and hiring technicians. They are also responsible for any technician working on their projects
- Students are expected to clean up after themselves, to take care of lab equipment and make sure it is maintained properly. Students are not responsible for normal equipment wear from use, however, if loss/damage occurs from negligence the student should be prepared to replace or repair it. For example, if something breakable is placed in your backpack instead of keeping it in an adequately secure case, you will need to repair/replace the item(s) if it gets broken.
- All students who will be handling chemicals must go through the proper lab safety training with John Wasielec, ESF's Environmental Health and Safety Officer (www.esf.edu/ehs)
- Field vehicles can be reserved with a Vehicle Request Form through ESF's Physical Plant (<http://www.esf.edu/physicalplant/forms.htm>)
- Any accidents related to field vehicles or personnel must be reported in writing to your MP and the appropriate authorities with 24 hrs. Have the proper forms available in the field!
- During the tenure as a student/post doc, no student will submit a grant without first discussing the proposed work and providing your MP a copy. Note: ESF grants legally must be signed by your MP unless specified otherwise by the grantee and discussed with your MP.

Expected Master's timeline - example	
First Semester	Take classes Investigate and develop a research project Start a thorough literature search, gathering papers relevant to your research topic
Second Semester	Take classes Early in the semester, submit a research proposal outline to your MP Complete a thorough literature review to become an "expert" in your research subject area – an annotated bibliography is strongly suggested Form a committee comprised of people that can help you achieve your goals Submit an early draft of research proposal Arrange and hold a committee meeting prior to your first summer of field/lab research Be sure to send a final research proposal to your committee 1 week prior to committee meeting
First field/lab season	Be prepared – have your sites identified & insurance worked out & permissions for doing work
Third semester	Arrange a committee meeting to provide an update on field research Type up methods for all research and analyze collected field data Cultivate opportunities for presenting your research, do a poster or a presentation! Finish classes
Fourth semester	Jan/Feb - Make sure all coursework requirements have been met & all forms completed and submitted to graduate school for graduation Jan - Submit 1 st thesis chapter, Introduction and literature review mid-Feb - Submit 2 nd data chapter, formatted for submission to a relevant journal end-Feb - Submit 3 rd chapter, formatting for journal submission mid-Mar - Submit 4 th synthesis chapter 1 month prior to defense, submit complete thesis for final review to your advisor 2 wks prior to defense, submit final thesis copies to committee
Within 6 mos of thesis defense, submit manuscripts to appropriate journals (ones cited often in the manuscript)	
MSc students who start in the spring semester have the added advantage of having a second field season and likely a much more solid and publishable set of research. However, they also must be very organized and prepared to finish most of their data analyses and writing the following fall. Realistically, these students will likely have to find alternate funding, e.g., a part-time job, and finish the writing and defense process in the spring semester (2.5 rather than 2 yrs).	

Thesis policies:

Theses should be written in the “publication” format (see graduate school description) with the first chapter being an introduction chapter (using the research proposal literature review as a foundation) and the final chapter a synthesis of where research results fit into the larger context of the relevant field. Tables and figures should be integrated within the text (not at the end of the chapter). This results in 4-5 chapters for a MS student and 5-6 for a PhD. Students should expect a minimum of three major editing sessions from your MP on each chapter with some sections likely needing additional editing.

- Forms requesting a thesis defense must be submitted three full months ahead of the defense date to allow the graduate school time to assign a defense chair and arrange a day/time that works for the full committee.
- Do not submit thesis chapters to other committee members until you and your MP have mutually agreed it is ready for circulation or have agreed it is prudent to do so. This is to ensure busy colleagues are not worn down with typos, formatting and other edits so that you get the very best feedback on the substance of your research.
- Your MP will not sign a thesis defense form without approving revisions of all chapters.

What NOT to expect of your advisor/committee members

- To provide instant turnaround with feedback on proposal, reports, letters of reference, etc. As a minimum, provide two full weeks for turn-around on these items both to your MP and committee members.
- To answer questions that you have not made a reasonable effort to answer yourself.
- To answer all questions. Your MP will not know the answer to all questions. Seek advice from fellow students, statistical experts, committee members or other faculty if necessary.
- To accept phone calls at home at night or weekends, unless it is an emergency or there has been a prior understanding or arrangement made.
- Provide financial support beyond the end of departmental, project, or scholarship support. Your MP will do all she/he can and provide guidance and suggestions, but resources are finite.

Overall, your MP should

- Strive to provide an environment amenable to learning, open discussion of ideas, and producing credible research without discrimination or harassment.
- Consider the student a research colleague and treat them with respect.
- Along with the supervisory committee, guide the student through his/her graduate studies program including courses and research.
- Provide timely and constructive feedback to written research questions, proposals, progress reports, thesis chapters, and publications, as well as discussion of your research ideas when you are developing them.
- With the student's help, provide reasonable resources and financial support to meet the mutually agreed upon research objectives of a thesis.
- Acknowledge appropriately student's contributions to research and other efforts in presentations and publications.
- Notify students of anticipated, prolonged leaves of absence from the University at the earliest date reasonable. Even when on leave, feedback should be provided as to your study progress.

Please note bullets in the following section may seem quite detailed, and very much common sense, but know they are based on past student questions and sometimes difficult experiences.

Students should

- Maintain regular communication with your MP. Keep your MP up to date about your research and course activities, particularly before you feel overwhelmed - they cannot help solve a problem if they are unaware of it. This either can be through regular project meetings, scheduled individual meetings, or written reports/emails when we cannot meet. At a minimum, you should meet with your MP once per semester, but monthly, bi-weekly or weekly can also be considered (make sure to discuss the schedule with your MP at the beginning of your program)
- Seek out and cultivate other ESF faculty, staff and students as mentors. Graduate school is difficult and having friends and supporters is an important aspect of a successful program.
- Be curious. Look around you and actively think while you are doing your research. Ask questions. Troubleshoot. Dream up and brainstorm and try out new methodology. Doing these things, taking the research to the next level, is the difference between a good undergraduate project and graduate level research.
- Participate actively in lab meetings and departmental seminars - absorbing information is not the same as critically evaluating it and providing detailed and respectful feedback. Also, get involved in departmental and college level activities and discussions – EFB/ESF will be your community and so contributing to shaping it and making it better is worth your time.
- Become familiar with departmental and degree program requirements as well as the graduate school. Know the forms that need to be filled out and deadlines for submission. Talk to EFB's graduate director, as well as lab mates and other experienced graduate students. Ultimately, meeting degree requirements in a timely manner is the **student's** responsibility.
- Practice good time management. Meet mutually agreed upon deadlines for work completion and work hard in the lab or field. This is often the difference between a mediocre and excellent thesis. Graduate school is a huge time commitment and for a majority of students, it will require more than 40 hrs/wk. Though most finish in ~2.5 yrs for MS and ~4-5 yrs for a PhD, these times may vary depending on when you start, success of your first field season or early experiments (often a second field season is needed where applicable), or if a PhD student is coming in with an MS and all of the experience that engendered. This timeline is very dependent on the student's work habits and capabilities as what takes one student only a few minutes (hours/days/weeks) may take another a few hours (days/weeks/months).
- Not plan on taking extended periods (more than 2–3 days) off and/or vacations during field seasons or during times of intense lab work/experimentation. Graduate TAs and research GAs are entitled to the same holidays as ESF employees, but with that, they are expected to be present and working during spring break and between semesters. If a period of time must be taken off, please provide adequate notice and let your MP know how you are covering your research obligations.
- Understand that those on departmental graduate teaching assistantships have teaching responsibilities of 20 hrs/week. This is in addition to taking classes and doing research, making finishing a graduate program in a timely manner challenging. Thus students on GTAs are encouraged to apply for fellowships and grants in order to relieve this time commitment.
- Write a well-rounded research proposal with solid and obtainable research objectives by the end of the second semester. This should comprise a 5-10 page introduction justifying the importance of the research (which will form the backbone of the first thesis chapter). This should be followed by logical well-researched methods for achieving the research objectives as well as a timeline of research and a discussion of the study limitations and potential pitfalls that may be encountered.

- Be proactive and learn about and prepare/submit any forms required/associated with conducting your research, such as Temporary Revocable Permits, Animal Welfare Forms, agency progress and final reports, and please make sure that your MP have the opportunity to review them *prior to submission*.
- Read and stay abreast of the literature in your area of research. The importance of this cannot be stressed enough for producing a quality research thesis. You can expect to be asked questions at your defense on general knowledge in your area. A logically organized annotated bibliography is strongly suggested.
- Give presentations (poster and oral) if conference expenses are covered by the project, scholarships, or ESF funds. Students should apply for ESF student travel grants prior to using project funding to attend meetings.
- Prepare a budget for your project and maintain an informal log of expenses and keep within the agreed upon budget.
- Realize that if you are on a departmental TA that your pay is spread over the school year only. You should apply for summer fellowships and help write grants to cover your summer research expenses. Please note all funding administered by ESF (i.e. grants) **must** go through your MP because they become financially responsible. As a fallback, you should budget your fall/spring income accordingly in case none come through.
- Copy your MP on all written communication between yourself and funding or research partners. Also, inform your MP of any event or action that has the potential to cause concern among our partners or people outside your research group so that your MP is not surprised by a telephone call or question at a meeting.
- Keep a detailed research notebook. Doing so is critical to remembering ideas and insights, knowing what you are accomplishing, as well as being an important reference for tasks completed, sites visited, people talked to, etc.
- Let your MP know about newspaper/magazine interviews/articles you are asked to do on your research and provide all reports for their review prior to submission, as well as provide copies of the final article/report. Note that all reports should have your MP's name listed on the document even if you did most of the report development, as ultimately, they are responsible for everything coming out of their lab.
- Provide your MP with digital copies of all data with data documentation and maps of study plots after every field season for safe keeping. At the end of the project provide full data files with proper written descriptions (metadata). They will not be able to sign your thesis until the data files have been provided to them.
- Maintain a degree of independence, especially for Ph.D. students and Post-docs. *Before asking questions, please make the effort to research the question.* Come ready to discuss various ideas or options, not to ask your MP on what to do.

Causes for immediate dismissal:

- (1) Unsafe behavior or actions that endanger yourself or others; for example drinking and driving a grant funded or state vehicle.
- (2) Falsifying data or plagiarism.
- (3) Unreasonable negligence in care of project equipment without assuming responsibility of repair or replacement.
- (4) Misuse of project funds.
- (5) Explicit sexual harassment or other serious unethical behavior.

Appendix B: Mentoring Tips¹

Tips for Graduate Students

- **Be proactive:** Take initiative for seeking your mentor out, arranging appointments, and communicating requests for time and assistance. Invisible students are rarely mentored.
- **Keep commitments (meet deadlines):** Demonstrate that you are self-motivated, self-monitoring, and reliable when it comes to delivering work promised at the time you promised it. Few things will impress a mentor more than sterling reliability in a student.
- **Always strive for excellence:** Excellent students set themselves apart by refusing to settle for mediocrity—particularly in work produced for the mentor.
- **Demonstrate openness to feedback:** Accept praise and criticism with openness and non-defensiveness; students who can tolerate and learn from corrections are more likely to be mentored.
- **Demonstrate responsiveness to coaching:** When your mentor takes the time to offer counsel or advice, be sure to follow-up later with evidence that you have put it into practice (or at least considered it thoughtfully).
- **Learn as much as you can:** Always read papers more than once, attend seminars and conferences and present your research as often as you can to get valuable feedback.
- **Communicate honestly and directly:** Be forthright, clear, and tactful in letting your mentor know what you need and how he or she can help.
- **Express appreciation:** Mentoring can be a challenging and difficult process. Never take for granted the help (in terms of time, money and energy) received from others. Being polite and thankful as you are expressing appreciation will reinforce good mentoring.
- **Accept increasing responsibility and autonomy:** As you progress in the academic program, accept larger tasks and greater independence; your job is to move from novice to junior collaborator with your mentor.
- **Accept imperfection and admit mistakes:** Although excellence is required, perfection is impossible; avoid getting mired in fruitless demands for perfect performance and be quick to admit mistakes when you make them.
- **Be mindful of your mentor's goals:** Remember that mentorship is a two-way street and that your mentor's time is precious. When possible, offer your mentor assistance with projects (e.g., lab, writing, teaching) that might simultaneously afford you experience and supervision.
- **Keep your expectations reasonable:** Avoid falling prey to unrealistic expectations of your mentor; your mentor cannot meet all of your needs, know everything about the field, or always offer undivided attention.
- **Maintain a sense of humor:** Humor is an excellent antidote for anxiety, frustration, and catastrophic thinking; most mentors appreciate a student who can keep things in perspective when times get tough.
- **Build a mentoring constellation:** Rather than expect your mentor to be all things, seek out a range of personal and professional support during your program including peers, more advanced students, and other faculty inside or outside the institution.
- **Know when to cut your losses:** Graduate school isn't for everyone. If you aren't enjoying yourself and motivated to be here, it is far better to be honest with yourself and your mentor and the earlier, the better.

¹ Gail Rose, University of Vt...

Tips for Mentors of Graduate Students

- **Be there:** The data are in: Mentorships flourish when faculty mentors are proactive in seeking out the protégé, scheduling routine appointments, and inviting more spontaneous interactions. Plan to meet with your students at least monthly and possibly more.
- **Affirm, affirm, affirm...:** Even your most accomplished students may suffer bouts of “imposter syndrome.” Encouragement and support are the most highly rated mentor functions from the perspective of protégés. Convey respect and confidence in no uncertain terms. Acknowledge their skills and encourage cultivation of new ones.
- **Ask questions and actively listen:** Take time to get to know your protégé. Ask good questions and listen carefully to the responses so that you gain an accurate picture of your protégé’s short-term goals and professional “dream.”
- **Communicate expectations clearly:** Tell your protégé precisely what you expect and what you most appreciate in protégés; if expectations conflict, work to resolve differences early on.
- **Be an intentional model:** Seek opportunities to model the skills and attitudes of a professional in your field. Bring your protégé to meetings, rounds, conferences, and other venues where he or she can watch and participate in these activities. Embody the application of your ethics code in all of your professional behaviors.
- **Give honest and timely feedback:** Provide objective, clear, and constructive appraisals of protégé performance—academically and professionally. Confront and correct when needed.
- **Provide coaching and socialization:** Offer protégés a window in on the workings of the academy, grant getting, institutional politics, and appropriate professional behavior. Explain the *hidden curriculum* in graduate school and demystify the system.
- **Expect excellence but confront perfectionism:** Convey expectations for genuine excellence in all areas (and model this as well). But be vigilant to perfectionism, unrealistic demands, and self-downing habits.
- **Challenge and sponsor:** Help your protégé avoid complacency and underachievement by encouraging increasing risk-taking as a professional. Sponsor your protégé for entrée into organizations and networks.
- **Model healthy balance in work & life:** Show protégés how to find balance between devotion to work and time away. Try to go home on time, exercise, pursue hobbies and encourage the same in protégés.
- **Maintain a sense of humor:** Humor is an excellent antidote for anxiety, frustration, and catastrophic thinking; nearly all protégés appreciate a mentor who can help them keep things in perspective when times get tough.
- **Encourage increasing reciprocity and mutuality:** Recognize the importance of promoting increasing collegiality as your protégé develops. The objective of any excellent mentorship is the eventual independence of the protégé; you are growing a colleague, not protecting a hierarchy.
- **Cultivate patience:** Learners make mistakes, so be sure to positively reinforce accomplishments and reassure rather than blame for minor mistakes.
- **Help find creative solutions:** When you cannot be the one to help, help find the resources they need to be successful.

Core Relationship Expectations

- **Anticipated Duration:** The mentor and student determine the approximate length of the relationship with the understanding that this may be subject to change. Generally, this is predicated on graduation or publication (whichever is the latter).
- **Frequency of Contact:** The mentor and protégé determine how frequently they will meet together for scheduled contacts.
- **Role Expectations:** The mentor and protégé identify the major roles that the mentor will assume (e.g., coach, sponsor, advisor) and how these roles relate to specific short and long-term goals.
- **Short and Long-term Goals:** The mentor and protégé outline the protégé's short and long-term goals including time-lines for accomplishing goals.
- **Boundary Maintenance and Confidentiality:** The mentor and protégé decide how they will deal with potential dual roles in the relationship, and clarify expectations for confidentiality.
- **Anticipated Separation:** The mentor and protégé identify major goals or milestones that will suggest a structural change or redefinition in the relationship and the need for separation.
- **Cross-Gender and Cross-Race Issues:** The mentor and protégé openly discuss cross-gender and cross-race concerns and develop a strategy to minimize negative outcomes from these concerns.
- **Relationship Evaluation:** The mentor and protégé define how frequently they will evaluate the relationship and what goals or objectives will be evaluated.

Appendix C: Research Proposal Guidelines and Effective Scientific Writing²

The watchwords of successful scientific writing are clarity, brevity and organization. These concepts are essential because you must provide sufficient detail so that a knowledgeable reader can interpret the validity of your work as presented in your proposal, and you must do so within reasonable page limits. It is important for you to understand that professional scientists (including your advisor and committee members) are faced with a staggering amount of papers and proposals to review so it is imperative you write information-rich text without redundant or superfluous information. One of the hardest tasks as a graduate student can be learning how to convey the right information in a succinct manner without loss of meaning.

This guide is intended to help you improve your writing, starting with writing a research proposal (see Appendix A). Following are required elements of any research proposal, key information to include in each section and suggestions for how to achieve parsimony in your writing. The key to parsimony is revise, revise, revise ... consider what each word contributes to a sentence and whether you might say the same thing in a sentence containing fewer words. To paraphrase Strunk and White (2000): Make definite statements, omit needless words – “the best papers are not written... they are re-written”.

WRITING RESEARCH PROPOSALS

Why write a research proposal? A proposal lays the groundwork for the research you are planning to do. In forcing you to think through the whole project from beginning to end, the proposal helps you to anticipate problems that may arise and have plans in place for dealing with them should they arise. Moreover, if you have an idea of where you are going, it is far easier to actually get there.

The first step requires substantial leg-work (or mental work) to identify a feasible research topic. Helpful questions include:

- Is there current interest in this topic in your field or a closely related field?
- Is there an available body of literature relevant to the topic?
- Is there a gap in knowledge that research can fill or a controversy that it might resolve?
- Is it possible to focus on a small enough segment of the topic to make a manageable project for a thesis project?
- Are there large problems to be surmounted in working on this topic and do you have the means to handle them in the time allowed?
- Can you envision a way to study the topic allowing objective conclusions to be drawn?
- Can you devise a clear statement of the purpose, scope, objectives, procedures, and limitations of the study?

After narrowing your interests down to a feasible research topic, the first step in writing a proposal is to prepare an outline followed by a rough draft. Start by writing preliminary answers to the following questions:

What is the tentative title? (This will likely change as your research progresses)

² Material is based on J. Frair’s Landscape Ecology course (SUNY-ESF) handout which borrowed from “Guidelines for writing and publishing scientific papers” by Guy Baldassarre (SUNY-ESF), Cornell University Library web materials, Mauch and Birch (1989) Guide to the successful thesis and dissertation, 2nd ed., and “Writing a Thesis Proposal”, Learning Centre, Univ of Sydney (<http://www.usyd.edu.au/lc>).

Why do you want to do this research? (What do you think you'll be able to say when your research is complete?)

What steps will you have to take to accomplish what you want to do? Can you put those steps into a logical and sequential order?

What resources will you need to conduct the study?

What assistance from other people will you need? (For example, skills of a supervisor, other staff members)

Will Ethics Approval be required?

The written proposal must contain an introduction reviewing relevant literature, explicit research objectives/hypotheses, a description of your methods, a timetable for the research, a succinct synopsis of why the research is important and an annotated bibliography. Details and suggestions for each of these elements follows:

Title

Always include a title. Generally speaking, a poor title is among the surest ways to insure your paper will not be read, whereas a good, informative title will encourage reading. Consider the following when developing the title:

- (1) Brevity (usually <10 words), but be specific and informative.
- (2) Include the nature of the study, principal species involved, and geographic location.
- (3) Do not use "cute," poetic, or idiomatic titles.

For example, consider a study of bird species diversity in Meadow Brook Marsh, a forested wetland located in the Adirondack Region of New York. A title like "Bird Species Diversity" doesn't include enough information. A better title would be "Bird Species Diversity in a Forested Wetland in the Adirondacks, New York." This title provides a better description of the proposal to come.

Introduction

The introduction is the most critical part of a manuscript or proposal because it *sets the stage* for your paper by stating the reason for the research and summarizes the body of literature laying the foundation for the work. If the problem (i.e., scope) of the paper is not presented clearly and understandably, the reader will have little interest in your solution and often reads no further.

The following questions can serve as a guideline:

<u>Question</u>	<u>Purpose of Information</u>
Why is the issue important?	Justify your research by explaining to the reader why this is an important area of research
What is the ecological issue?	Orient the reader by giving some general background to the topic
What do we know about the topic in general?	Provide the reader with a context for your research by giving a brief summary of past research
What are some of the weaknesses in our knowledge about the topic?	Justify your research by highlighting gaps, weaknesses, etc.
What are you going to do about these gaps?	Give the reader a general statement about the purpose of your research

Some "rules" for a good introduction are:

- (1) Work from general to specific from the start of the introduction to the end, as well as within each paragraph (often described as a "funnel" or inverted triangle). Each paragraph starts with a topic sentence conveying what the paragraph is about and is followed by supporting sentences providing greater detail on the topic. Strive to finish each paragraph with a transition statement that makes a conceptual connection to the topic of the next sentence.
- (2) Before writing, outline the major points or key bits of information you wish to include. Organize those thoughts into paragraphs of like information, and then organize the flow of the paragraphs to lead logically to your research objectives. Determine how many paragraphs are necessary to convey the information.
- (3) Generally, your first paragraph identifies the overarching theme into which your specific research fits, clearly presenting the nature and scope of the problem to be investigated. It is in this paragraph that you convince the reviewer your topic is interesting. Your reader should have an intuitive idea of what your research questions will involve from this first paragraph alone.
- (4) In the next few paragraphs, review pertinent literature so as to orient readers to the topic. Recognize that simply because a paper is written on your study species or area of interest does not make that paper pertinent to your work. Keep your research question(s) in focus. Highlight research that provided key insights into your question, identifies key knowledge gaps, or perhaps tries to answer your question but did so in an unsatisfactory way. By the time you get to your last paragraph (where you state exactly what your research entails), you should have made a compelling case for why your research is needed and why your approach is the right way to go about it (i.e., the reader should come to the same conclusion as you on how to move forward). Your objectives should emerge as the obvious next step from these introductory paragraphs.
- (5) Citing appropriate literature is critical. Be sure the reference you cite is the actual paper that originally presented the idea/fact. All too often, authors are given credit who were not the actual researchers who first quantified and published the relevant data. Be a critical reader and ask yourself if the paper was the originator of the idea/fact. Do not be surprised if you find they were not and that the author of the paper you are reading did not appropriately cite their statements. Something else to be particularly aware of is not everyone reads and comes to the same conclusions about facts/ideas from a particular paper. This means that even if a paper you are reading makes a statement in their introduction and cites a reference that you should accept it as true... ALWAYS read the paper yourself to verify the statement. Specific details for citing literature can be modeled after papers written by your advisor. Did he/she list multiple papers alphabetically or by date? Was et al. and scientific names italicized?

Introductions often are not long and indeed may be the shortest part of a scientific paper (although they generally take up significantly more space in a research proposal). The important point is to develop a quality introduction as a means of enticing the reader to proceed further and giving them a clear picture of what your research entails.

Research Objectives

This section explicitly identifies your research objectives/hypotheses. Clearly identify your overall goal followed by specific objective(s)/hypotheses, using words like ... "The overall goal of this research is to... The first objective/hypothesis is ..." or "I will test/determine/model ...".

Methods

The main purpose of this section in a scientific proposal is to provide enough detail that another competent professional can evaluate the validity of your intended work. Part of the struggle is identifying what is the most salient information to present. The questions a reviewer asks include: are your methods appropriate to the question given information or the kind of data you have? Will you be able to detect the differences you seek? What is your sampling design and what specific variables will you measure? What kind of data do you plan to collect (counts of organisms, density or percent cover data from point/transect/quadrat sampling)? In what units are your dependent and independent variables measured? What is your sample size? What is your unit of replicate? What is the resolution and extent of the sampling? What is your control? These are all crucial to helping guide you to the most appropriate statistical methods for analyzing the data you collect.

Considerations for this section are:

- (1) In a scientific paper you generally would refer the reader to a reference of a particular technique rather than provide a step-by-step description of the whole process. However, in writing your research proposal, your committee needs to see how well you understand the approach to give appropriate feedback so you should err on the side of too much explanation when it comes to describing your experimental set up, a statistical test or data manipulation.
- (2) Always include proposed dates of sampling. For example, do not just write "water chemistry was sampled with a portable water analysis kit." Rather, "We sampled water chemistry each day at 10:00 from 1-30 June 1997 at 3 randomly located stations in the wetland."
- (3) If your methods are lengthy, use subheadings to compartmentalize items. For example, if you conducted a study involving a variety of components, subheadings might be Soil and Water Analysis, Vegetation Analysis, Bird Census, etc.
- (4) How will you test your hypotheses? What statistical test will you use. Note that *regression* is a general category of methods that includes linear regression (for continuous data), poisson regression (for count data), and logistic regression (for response variables having only 2 possible values) to name but a few. Be explicit about your data and what methods you will employ. Strive for specificity rather than generalities as much as possible. At what significance level will you conclude a difference between your variables of interest?

Justification and Importance of Research

Compose a short paragraph stating why this research necessary and how will it contribute to the current state of knowledge. Also, address that you know your intended audience, e.g., what journals you expect to publish your research in.

Timetable of research

Include specific dates you anticipate beginning and concluding specific portions of your field work or lab work, doing statistical analyses, writing and defending your research.

Annotated Bibliography

An annotated bibliography is a list of citations for books, articles and documents, where each (or selected) citation is followed by a brief (usually ~50-100 words), descriptive and evaluative paragraph (i.e., the annotation). The purpose of the annotation is to inform the reader of the relevance, accuracy and quality of sources cited. In contrast to the cited paper's abstract (the purely descriptive summaries often found at the beginning of scholarly journal articles or in periodical indexes), annotations are critical; exposing the author's point of view, clarity and appropriateness of expression and authority. Not all proposals require annotated bibliographies but they can be incredibly useful to reviewers.

Example:

Waite, L. J., Goldschneider, F. K., & Witsberger, C. (1986). Nonfamily living and the erosion of traditional family orientations among young adults. *American Sociological Review*, 51, 541-554.

The authors, researchers at the Rand Corporation and Brown University, use data from the National Longitudinal Surveys of Young Women and Young Men to test their hypothesis that nonfamily living by young adults alters their attitudes, values, plans, and expectations, moving them away from their belief in traditional sex roles. They find their hypothesis strongly supported in young females, while the effects were fewer in studies of young males. Increasing the time away from parents before marrying increased individualism, self-sufficiency, and changes in attitudes about families. In contrast, an earlier study by Williams cited below shows no significant gender differences in sex role attitudes as a result of nonfamily living.

REVIEWING RESEARCH PROPOSALS

The following list outlines criteria that committees and examiners look for in a research proposal or finished thesis³. It would be useful to keep these criteria in mind as you are writing your proposal and these should be used in the critical review assignment.

- (1) Title is clear and concise.
- (2) Problem is important and clearly stated.
- (3) Limitations and delimitations of the study are stated.
- (4) Delimitations are well defined and appropriate to the solutions of the problem.
- (5) Assumptions are clearly stated and tenable.
- (6) Research does not violate human or animal rights.
- (7) Important items are well defined.
- (8) Relationship of study to previous research is clear.
- (9) Review of literature is efficiently summarized.
- (10) Statements are appropriately attributed with date-ordered citations.
- (11) Research objectives/hypotheses are clearly stated.
- (12) Research objectives/hypotheses are discoverable, testable, or answerable.
- (13) Research objectives/hypotheses derive from the review of the literature.
- (14) Methods are described in detail.
- (15) Methods are appropriate for the solution of the problem.
- (16) Reliability of methods are explained.
- (17) **Population and sample are clearly described.**
- (18) Variables have been controlled.
- (19) Appropriate statistical methods are used to analyze data.
- (20) Material is clearly written.
- (21) Sentence structure and punctuation are correct.
- (22) Minimum of typographical errors and extraneous words.
- (23) Spelling and grammar are correct.
- (24) Tone is objective (unbiased and impartial).
- (25) Overall rating of creativity and significance of the problem.
- (26) Objectives can be met within the timeframe outlined.

³ Mauch, J.E. and Birch, J.W. (1989). Guide to the successful thesis and dissertation, second edition. Marcel Dekker, New York.

GENERAL WRITING STYLE FOR SCIENTIFIC PAPERS

These are general guidelines for concise writing and should serve as a useful reference that should be referred to often for graduate writing exercises.

Voice

There are two “voices” in English: passive and active. Basically, if the subject of a sentence performs the action, the sentence is in active voice. The sentence is in passive voice if the subject of the sentence receives the action. The active voice is usually preferred because it is more direct and less wordy. Consider the examples below:

- (a) The dog was called by Mary. (Passive)
- (b) Mary called the dog. (Active) ... *Note reduction in words by 33%.*

Person

Use of first vs. third person constructions is one stylistic area where scientific disciplines and journals vary. Some disciplines and their journals (e.g., organismal biology and ecology) have moved away from a strict adherence to the third person construction and permit limited use of the first person in published papers. With this knowledge, you should generally avoid the first person (I, we) and reword to the third person by placing the subject of the sentence first. Write “A was greater than B” versus “I found that A was greater than B.” or “I will locate field plots...” to “Field plots will be located...”.

Tense

Scientific writing uses two major tenses: present and past. Some general rules for writing tense in a research proposal are:

- (1) Established information: present tense.
- (2) Methods and Results sections: past tense.
- (3) Presentation of data: present tense.
- (4) Attribution of information (e.g., someone else’s work): past tense.

Other General Points

- (1) Avoid short, choppy word sequences because they are nearly always a sign of wordiness, e.g., “The ducks used to be,” “The data are significant because,” “There may have been,” etc. These phrases can almost always be removed entirely without loss of clarity. Learn to spot wordiness by homing in on these short, choppy sequences (often around the verb “to be”). The “cure” is usually simple and obvious, once the problem is diagnosed. Here are a few examples:

Replace “a number of” with “many.”

Replace “based on the fact that” with “because.”

Replace “first of all” with “first.”

Replace “for the purpose of” with “for.”

Replace “in order to” with “to.” In general, omit the phrase “in order to.”

Replace “due to the fact that” with “due to” or “because.”

Replace “during the time that” with “while.”

Replace “in the month of May” with “in May.”

Replace “it is interesting to note that” with the first word after “that.”

- (2) Avoid using nouns as adjectives. For example, rather than "Summer Mallard activity budgets," use "Mallard activity budgets in summer."
- (3) Rework your paper several times. Eliminate unnecessary words and repetition. Consider reorganizing material to reduce wordiness and improve the conceptual flow. Remember there are 4 main points to a well-constructed paragraph: (1) each paragraph begins with a solid topic sentence that quickly and clearly introduces the reader to the topic of that paragraph, (2) each sentence in the paragraph relates to that topic, (3) there is good transition between sentences, and (4) there is good transition between paragraphs. Spell check and proof read your final version (get a colleague’s review before submission).

Other Writing Rules of Thumb

- **Data are plural ... *these data show not this data shows* ...**
- When rewriting, you often can eliminate the preposition “the” from a sentence, and there are LOTS of them in a paper. If a sentence sounds fine without the “the”, leave it out.
The emerald ash borer was discovered near Detroit MI in 2002 (Mattson 2003).
Emerald ash borer was discovered near Detroit MI in 2002 (Mattson 2003).
- Similarly, you can often eliminate the word “that.”
Example: The data suggest that the lake was polluted.
Better: The data suggest the lake was polluted.
- Proper use of “that” and “which.” Use that to introduce restrictive clauses (i.e., clauses that are essential to the meaning of the sentence), and use which to introduce nonrestrictive clauses, which are clauses not essential to the sentence.
- Generally, avoid using a comma to join a compound predicate.
Wrong: The birds were captured, and then banded.
Correct: The birds were captured and then banded.
- Do use a comma to join two independent clauses.
Wrong: We collected birds but we released mammals.
Correct: We collected birds, but we released mammals.
- Use a comma to set off introductory phrases. Consider the following sentences with and without this introductory comma:
At night birds roosted in cavities
At night, birds roosted in cavities.
- Avoid constructing sentences with “respectively,” which forces the reader to match items with those that appear earlier in the sentence. Example: The mass of males and females was 45 and 30 kg, respectively. Better: Mass was 45 kg for males and 300 kg for females.
- Put modifiers in their place! Adjectives modify nouns and adverbs modify verbs, predicates go with subjects, etc. Put such pairs near each other. Example: The ducks at the far end of the lake were captured. Better: The ducks were captured at the far end of the lake. Note how the subject and predicate are now joined.
- Do not misuse the demonstrative pronouns “this” and “these.” Writers often begin sentences with either word used as a noun, which is confusing because all pronouns need antecedents (the noun they replace), and it is difficult to have a clear antecedent at the beginning of a sentence!

Example: This means the data are inconclusive. Better: This analysis means the data are inconclusive. In general, whenever you use a pronoun, be sure the antecedent is crystal clear. Consider the following: We suggest cessation of feeding in January initiates an increase in digestive efficiency of pheasants, but this is not sufficient to maintain fat reserves. (“This” can refer to either supplemental feeding or digestive efficiency).

- Recognize and eliminate dangling participles. First, recognize that a dangling participles occurs when the participle form of a verb (the -ing or -ed form) has no agent (subject) to perform the action attributed to the verb. Consider the following example: Ferrets were located at night using spotlights operated from trucks. Another one of my favorites: Rabbits were spotted using a 100-W spotlight from the top of a 4WD vehicle.
- Always check subject–verb agreement. Plural or compound subjects take plural verbs, and singular subjects take singular verbs.
- Common prefixes like post, non, pre, multi, inter, intra, mid, anti, bi, etc., are almost never hyphenated.
- An adverb ending in “ly” plus a participle or adjective is always open, never hyphenated.
Wrong: poorly-attired man.
Correct: Poorly attired man.
- Hyphenate a verb–adverb before a noun but not after.
Example: The well-attended function was enjoyed by all.
Alternative: The function was well attended.
- Hyphenate confusing compound adjectives. For example, consider the phrases “new car owner,” new-car owner,” and “new car-owner.”
- Do not worry much about split infinitives, which are verbs divided by adverbs, unless the modifier is far away from the verb. For example, The dogs were running wildly versus The dogs were wildly running. Even in the case of infinitives like “to sample” or “to decide,” split infinitives are sometimes acceptable. Consider: To sample randomly versus to randomly sample. Generally, the “to” form of an infinitive is more likely to remain unsplit, but where would the Enterprise be without “to boldly go.”

Word Choice

Affect–Effect: Affect is a verb that means to influence, whereas effect is usually a noun meaning result.

Among–Between: Use among when a relation is between more than two items, and use between when the comparison is between only two items.

Circadian: About 24 hours.

Compare–Contrast: Compare points out likenesses, whereas contrast points out differences.

Compose–comprise: Compose means to make up, whereas comprise means to include.

e.g., – i.e.: the former means for example, whereas the latter means that is.

Ensure–insure: Ensure means to make certain, whereas insure means to assure against loss.

Farther–Further: Further indicates “greater in degree,” whereas farther indicates more distance.

Example: We walked two miles farther to discuss things further.

If–Whether: If is used to express conditions, whereas whether is used to express doubt. If it rains, the game is postponed. I wonder whether it will rain.

Impact–Effect: Impact primarily means the striking of things against each other and secondarily means effect. Hence, use effect as in “The effect of the experiment was . . .” not “The impact of the experiment was . . .”

In–Into: In means motion within a narrowly defined space, whereas into usually comes after a verb and means motion into space. Example: We walked into the room.

Irregardless: This word should never be used. Use regardless.

Percent--Percentage: Percent is an adjective (usually) or a noun, whereas percentage is a noun meaning part of a whole expressed in hundredths. Hence, percent error, not percentage error.

Precision–Accuracy: Precision denotes refinement (e.g., 3.45 is more precise than 3.4), whereas accuracy denotes correctness.

Principle--Principal: Principal means a sum of money or a chief person, and as an adjective denotes main or chief. Principle is always a noun and means a truth, a rule.

Since--Because: Since means from some time in the past, whereas because means “the reason that.” Since 1980, the goose population has increased because of abundant food.

Then--Than: Than is a conjunction used for comparison, whereas then is an adverb denoting time.

To--too: To is a preposition (to the lake), whereas too is an adverb meaning also.

Utilization: Substitute the word use.

Very: Very, surely, extremely, and similar words have been overused as modifiers to the point of losing some of their value. Use these words sparingly and carefully.

While: Means “during the time that.” Use for time relations but not as a synonym for whereas, although, and similarly, all of which do not imply time.

For further information see:

<http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWgeneral.html#person>

Be sure to seek out and read more about citations and citation styles. These can vary by discipline, e.g., citing multiple sources by date order, sorting them alphabetically, italicizing et al., or not. You can also use previous papers written by your advisor as a template.

Appendix D: Quantitative Courses

The following is a list of ESF and SU courses (in italics) in different quantitative disciplines that are of use to graduates in environmental and natural resource sciences. Pre-requisites are shown in brackets. Classes with a prefix of 400 or less do not give credit toward a graduate degree but do appear on your transcript. There is no official graduate curriculum in EB, these course lists are provided here to illustrate skillsets that may have career value.

Technical Skills

EFB 797 (F): R & Reproducible Research
EFB 797 (S): Data Management
CPS 196 (F and S): Intro to Computer Programming
CPS 504 (Occasional): Intro to C++ [CPS 196]
GEO 683 (F and S): Geographic Information Systems

Mathematical Ecology

APM 205 (F) and APM 206 (S): Calculus for Science and Engineering
APM 307 (F): Multivariable Calculus [APM 205 and 206]
APM 485 (S): Differential Equations for Engineers and Scientists [APM 307]
APM 585 (S): Partial Differential Equations for Engineers and Scientists [APM 485]
EFB 796 (S): Ecological Modeling
EFB 518 (F): Systems Ecology

Decision Theory

APM 595 (S): Probability and Statistics for Engineers [APM 205 and 206]
ERE 465 (F): Environmental Systems Engineering [APM 595]

Statistical Modeling

APM 510 (F): Statistical Analysis
APM 625 (F): Sampling Methods
APM 630 (F): Regression [Intro Stats]
APM 620 (S): Experimental Design and ANOVA [Intro Stats]
APM 635 (S): Multivariate Statistical Methods [Intro Stats]
APM 645 (S): Nonparametric Statistics and Categorical Data Analysis [Intro Stats]
EFB 796 (F): Quantitative Methods and Models in R
EFB 796 (S odd years): Population Parameter Estimation using Program MARK
EFB 796 (F odd years): WinBugs for Ecologists, an Introduction to Bayesian Analysis
EFB 796 (S even years) Bayesian Population Analysis
EFB 796 (S): Landscape Ecology [Intro GIS]
EFB 797 (F occasional): Occupancy Modeling
ERE 621 (F): Spatial Analysis [Intro GIS, ERE 335 or permission of instructor]

Appendix E: Graduate Student Self Evaluation Form

Students: Please read through the form then fill in all sections

Student Name: _____ Date of Evaluation: _____
Date of Initial Enrollment: _____ Degree Sought: MPS MS PhD
Anticipated Graduation Date: _____

Program and Degree Requirements:

All Degrees

- 3B Form: Graduate Program of Study
- EFB Grad Web Page Photo/Summary
- GPA \geq 3.0?

MS, PhD Only

- Research Proposal Approval Form
- Seminar Requirement, # Taken: ___
- Candidacy Exam (PhD)

What are your current career goals and how does your degree program fit into them?

Have you met your goals for teaching experience, and if not what experience do you want?

Evaluation Category

Thesis/Dissertation Progress
(i.e., proposal, data collection, data analysis, written chapters)

Excellent

Good

Fair

Unsatisfactory

N/A

What is the long term overall objective of your research effort?

Has this changed since the last committee meeting? If so, how?

What are your future goals related to the thesis or dissertation?

<u>RA Performance</u> (i.e., reports to grant sponsors, any tasks you are paid to perform unrelated to your thesis/dissertation.)	<u>Excellent</u> <input type="checkbox"/>	<u>Good</u> <input type="checkbox"/>	<u>Fair</u> <input type="checkbox"/>	<u>Unsatisfactory</u> <input type="checkbox"/>	<u>N/A</u> <input type="checkbox"/>
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Review progress to date, expected future progress

<u>Presentations/ Publications/ Awards/Honors</u>	<u>Excellent</u> <input type="checkbox"/>	<u>Good</u> <input type="checkbox"/>	<u>Fair</u> <input type="checkbox"/>	<u>Unsatisfactory</u> <input type="checkbox"/>	<u>N/A</u> <input type="checkbox"/>
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Describe any posters/presentations given, publications accepted, and awards (financial such as grants, or honorary such as Best Talk or Poster) received since your last committee meeting

<u>Course Requirements Progress</u> (Bring your Grade Report)	<u>Excellent</u> <input type="checkbox"/>	<u>Good</u> <input type="checkbox"/>	<u>Fair</u> <input type="checkbox"/>	<u>Unsatisfactory</u> <input type="checkbox"/>	<u>N/A</u> <input type="checkbox"/>
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Have you completed the necessary credits and seminars; does your plan follow your 3B form; what is your expected future progress

<u>Overall Performance</u>	<u>Excellent</u> <input type="checkbox"/>	<u>Good</u> <input type="checkbox"/>	<u>Fair</u> <input type="checkbox"/>	<u>Unsatisfactory</u> <input type="checkbox"/>	<u>N/A</u> <input type="checkbox"/>
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Summary of your overall performance as a graduate student and suggestions for how you plan to advance in the coming year, noting any areas in need of improvement.

Major Professor

Committee Member

Committee Member

Student