



# THE GRADUATE PROGRAM IN NATURAL RESOURCES CONSERVATION

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# 1. INTRODUCTION TO THE GRADUATE PROGRAM IN NATURAL RESOURCES CONSERVATION

**DISCLAIMER:** *Throughout this document we refer to the graduate program, singular, in the Department of Natural Resources Conservation (NRC). In reality, currently there are two separate graduate programs within the Department: Wildlife and Fisheries Conservation (WFCON) and Forest Resources (FR). However, we are currently in the process of consolidating the graduate programs into a single overarching program with several areas of concentration. Formal adoption of this program structure will not likely take place until Fall 2010. In the interim, the policies, procedures and requirements detailed in this document apply equally to the WFCON and FR Graduate Programs. Consequently, in this document we refer to a single graduate program in NRC. In addition, we refer to five areas of concentration which currently are not formally recognized by the Graduate School; thus, we refer to these concentration areas for descriptive purposes only. Lastly, we refer to Graduate Concentration Coordinators (GCCs) throughout. In the interim, until the new program structure is formally adopted, all administrative duties of the GCCs will be met by the Graduate Program Directors: Kevin McGarigal for WFCON and Matt Kelty for FR (i.e., substitute GPD for GCC throughout).*

Welcome to the graduate program in the Department of Natural Resources Conservation (NRC) within the College of Natural Sciences at the University of Massachusetts. We trust your courses, the experience you gain, and the interactions that you have with your professors and colleagues will serve you well throughout your professional career. This document provides a detailed description of all policies, procedures and requirements specific to a graduate degree in NRC, inclusive of the Master of Science (MS) *Thesis Degree*, the MS *Professional Degree*, and the Doctor of Philosophy (PhD). You are personally responsible for adhering to all of the policies and requirements of the program as detailed in this document; do not rely on your major advisor to see that you meet these requirements.

This document is organized into several sections. This first section provides an overview of the graduate program and its administration. The second section details a variety of practical needs that will help you “survive” the program and navigate many of its obstacles. The third section describes the academic program in detail, including general policies, procedures and administrative requirements and the specific requirements of each degree concentration. For specific information regarding official Graduate School policies and regulations, you should obtain copies of the "Graduate School Bulletin" and the "Graduate School Handbook" (<http://www.umass.edu/gradschool/handbook/>). Together, these documents contain nearly all of the technical information you will need to know to successfully complete the program.

## 1.1 The Program Niche

Unrelenting demand for more and more commodities and services from global ecosystems raises questions of limits and sustainability. The rapid human modification of Earth's ecosystems is signaled by the unprecedented decline of thousands of plant and animal species, many of which have become extinct. Coupled with growing concerns about the consequences of global climate

change on ecosystems, this biodiversity crisis has stimulated a great deal of interest in environmental conservation. The result has been increasing public involvement in the conservation planning and management process, increasing scrutiny of management decisions affecting natural resources and the environment on both private and public lands, and aggressive court challenges on the interpretation of existing legislative regulations affecting natural resources. At the same time, recent advances in technology have created an explosion in new quantitative approaches to the study and management of natural resources and the environment. Altogether, the study and management of natural resources and the environment has entered a period of unprecedented change. The Graduate Program in Natural Resources Conservation (hereafter referred to as simply the “Program”) intends to play a significant role in this transformation.

Recognizing the growing complexity of environmental conservation, the Program has evolved into a broad, multi-faceted degree program, with diverse opportunities for emphasizing 1) wildlife, fish and conservation biology, 2) forest resources and arboriculture, 3) water, wetlands and watersheds, 4) human dimensions and environmental policy, or 5) building and construction technology, with options for a thesis (research) or professional (non-thesis) degree in any of these areas of concentration. To support these degree programs, there are currently more than 50 courses offered within the Program taught by NRC faculty (note, many of the courses are taught on an every other year basis).

The Program is especially distinctive in a number of ways. First, faculty affiliated with our federal cooperators form an integral and essential part of the Program. Specifically, faculty associated with the USGS Cooperative Fisheries and Wildlife Research Unit at UMass-Amherst teach regular courses and support many graduate students; they are a vital component of the Program adding both depth and breadth to the Program. Faculty affiliated with USGS Conte Anadromous Fish Laboratory in Turner’s Falls and the USDA Forest Service Northern Research Station (Fish and Wildlife Habitat Research Unit) in Amherst also play a vital role as they support graduate students, serve on student advisory committees, and occasionally participate in teaching.

Second, the Program maintains strong ties to UMass Extension and the Natural Resources and Natural Resources Conservation (NREC) Program. Specifically, the NREC Program works collaboratively with faculty to secure research and outreach grants that provide support to graduate students and research associates affiliated with the Program. They also facilitate the outreach aspects of a number of projects, helping to accomplish the outreach mission of the Department and Program.

Third, due in part to the research interests of individual faculty, the Program is recognized as a leader in the field of international wildlife conservation. As a result, the graduate student body is comprised of a substantial number of international students. Their presence and involvement in the program helps to foster student diversity and promote global perspectives on natural resource conservation issues, and the diverse world views and experiences they bring to the Program, both inside and outside of the classroom, adds substantial breadth to the Program.

Lastly, the Program attracts a significant number of students interested solely in training for a professional career in environmental conservation; that is, they have no interest in pursuing a PhD or a career in science. Many of these students are working professionals seeking graduate-level training in a particular field of study. More often than not, however, these are simply students with a recently acquired undergraduate degree who recognize that an MS degree opens the door to excellent employment opportunities as a professional conservationist. The Program offers several opportunities for students seeking a professional degree.

## 1.2 The Program Vision

The following is our vision for the Program:

“The Program is recognized nationally and internationally among scientists and professionals as a high-quality program and as a result is able to attract the highest caliber students. The Program has a strong sense of community, both socially and scholarly, such that students cherish their participation in the program and become strong advocates of the program after finishing their degree. The Program offers a comprehensive quality curriculum in the core topic areas of 1) core science (biology, ecology, conservation and environmental building design), 2) quantitative and physical sciences, and 3) human dimensions (resource values, policies, programs and economics), and effectively engages adjunct faculty in the process. The Program offers extramurally-funded research assistantships on a broad range of environmental conservation topics and provides effective training for students seeking either a thesis (research) degree or a professional (non-thesis) degree. MS thesis degree students completing the Program are highly competitive for conservation science positions in government or the private sector, and some are well prepared to meet the challenges of any PhD program. Similarly, doctoral degree students completing the Program are highly competitive for conservation science positions in academia, government or the private sector. Faculty and students jointly publish their research findings in leading scientific journals.”

## 1.3 Organization of the Program

The Program offers training in five areas of concentration: 1) wildlife, fish and conservation biology, 2) forest resources and arboriculture, 3) water, wetlands and watersheds, 4) human dimensions and environmental policy, or 5) building and construction technology, with options for a thesis/dissertation (research) degree or professional (non-thesis) degree in any of these concentrations. The *thesis/dissertation degree* leads to the MS or PhD degree and centers around the completion of a major independent research project in addition to a modest coursework requirement. The *professional degree* leads to the MS degree and centers around a professional paper based on an internship/practicum in addition to more substantial coursework requirement. Both degree options provide students a strong foundation in three core topic areas: 1) core science (biology, ecology, conservation and environmental building design), 2) quantitative and physical sciences, and 3) and human dimensions (resource values, policies, programs and economics). The MS thesis degree is intended to prepare students for the option of pursuing a PhD and an eventual career in science. The MS professional degree is meant to be a terminal degree for students seeking graduate-level training in a particular field of study and a career as a professional conservation scientist.

## 1.4 Administration of the Program

### *1.4.1 Major Advisor/Professor*

You should know upon entry into your degree program who your major advisor will be since students are not admitted into the graduate program without a faculty member having first agreed to serve as their advisor (also called major professor). This person will play a major role in the many academic decisions you will face while enrolled. Your major professor will chair your examination/advisory committee (see “Examination/Advisory Committee”) and be generally responsible for supervising your graduate work. Schedule regular (weekly or monthly) meetings with your major professor to discuss your research and your courses, and other professional interests and concerns, too.

Each major professor will have a slightly different way of keeping track of project or other expenses so it is necessary to check with her/him, even for small amounts, before purchasing or ordering items. Be sure you are aware of the specific requirements from our bookkeepers regarding purchases, too.

Also, it is better to ask early about expectations regarding work hours, methods of data collection and handling, etc. before a problem arises. Note: there really is no assumed vacation time for graduate students, except as negotiated by the Graduate Employee Organization (GEO). If you are receiving a 52-week stipend, you are expected to be working full-time on the project that is paying you. Again, each major professor will have his/her own concept of what constitutes reasonable "flex" time. It is prudent to ask questions before rather than after a problem arises, so clear any proposed time-off with your advisor well ahead of time.

At times, emergencies arise and it may be important to contact you quickly. Please make it easy for your major professor, the Graduate Concentration Director, the Graduate Program Director, or office staff to find you by filing your departmental and home phone numbers with each of them. If you move, be sure to update the listing. Also, check your mail box and e-mail daily if possible.

### *1.4.2 Graduate Program Director (GPD) and Graduate Concentration Coordinator (GCC)*

In the eyes of the University, the Program is a single graduate program with a single Graduate Program Director (GPD); thus, all official correspondence between the Program and the graduate school must be via the GPD. Internally, however, the Program is organized into several concentrations along the lines of major sub-disciplines, as described above. Each concentration has a Graduate Concentration Coordinator (GCC). Much of the red tape associated with your program, such as thesis committee appointments and the forwarding of thesis defense results, will involve your GCC, as well as your major professor. The GCC is your program link with the GPD and Graduate School and can help you cope with the Program and Graduate School procedures. Most of the paperwork for the Graduate School will require the GPD signature, but your GCC will prepare the paperwork for the GPD signature.

Sometimes, the GCC (and/or GDP) is useful as a sounding board if you have a problem you are reluctant to raise with your major professor, and the GCC (and/or GDP) can help you resolve any serious conflicts you are having with your major professor or any aspect of the graduate program. Remember, the GCC (and GDP) is the graduate student advocate and is there to help you succeed in the program. Problems regarding money ultimately should be resolved through discussions among the Department Head, the GCC, your major professor, and you.

## 2. PRACTICAL NEEDS

### 2.1 Student ID Card: you need this to do just about anything!

*What is a UCard?*

- Official UMass Student identification card

*How do I obtain a UCard?*

- Go to the UCard office located in the Franklin Dining Commons, Room 104
- There is no additional charge for your UCard (it is included in your student fees)
- If you loose it you will have to pay a replacement fee

*What do I use the UCard for?*

- Library card for the 5-College Library System (library bar code is located on the front)
- You can set up a debit UCard account that can be used to make purchases on campus (copy machines, food, etc.)
- Serves as a PVRTA bus pass (follow link to find more information about bus schedule and routes: <http://www.umass.edu/transit/bus.html>)
- Used to access recreational facilities (see below for information on rec facilities)
- Student discounts at many local businesses

### 2.2 People you need to know

*Who:* **LINDA FORTIN**

*Where:* Main office (front desk)

*What:* Linda is the person to contact if you need:

- To have your name added to the NRC email list. Give Linda your name and UMass email address with the date of your request. The email list will tell you about department happenings and important administrative updates
- A mail box in the Holdsworth mailroom
- Keys to campus buildings e.g Holdsworth front door and computer room, Draper (or where ever your new office is located). All students should receive multiple keys: one key to Holdsworth; if your office is in another building besides Holdsworth (e.g. Draper), you will need a key to the exterior door and a third key to your office. Make sure that all 2-3 keys are ordered when you place your request. The main office may have spare copies of some keys on hand.
- To hire an undergraduate assistant. This may be as a summer assistantship or for work-study. Linda will help you fill out forms to get you started. Your assistant's hours should also be submitted to Linda.
- Reserve one of the department conference/meeting rooms (Holdsworth 312A or 306). Forms are on the file cabinet next to the front desk.
- Teaching Assistant related class materials such as large copy jobs (handouts, papers), course bluebooks, bubble sheets, etc.
- Student forms

- To report a maintenance problem. Linda will then contact the physical plant to have the problem fixed
- A guest parking permit. Guest passes for visiting lecturers as part of a class or department meeting (e.g. committee meetings). Please give at least one day's notice for a pass. Parking passes for all other guests may be requested but will cost \$5 per day.
- To reserve and sign out audio-visual equipment
- Send out and receive packages (e.g. UPS)

**Who: LORI MINOR**

*Where:* Main office (offices to the right)

*What:* Lori is the person to contact if you need:

- To submit forms and receipts for travel reimbursement. Lori can also answer questions about what is covered, what the current mileage rate is, etc.
- To submit a receipt for a (grant-related) purchase over \$500
- To process Teaching Assistant appointment paperwork

**Who: ROXANN CORMIER**

*Where:* Main office (offices to the right)

*What:* Roxann is the person to contact if you need:

- Purchasing procedures for grant-related spending
- To request reimbursement for grant-related out-of-pocket expenses
- To suggest (minor) web-page maintenance and updates. Major website issues should be directed to Alex Schreyer ([mail@alexschreyer.net](mailto:mail@alexschreyer.net))

**Who: CAROLYN SAFARIK**

*Where:* Main office, back office (to the right)

*What:* Carolyn is the person to contact if you need:

- To process Research Assistant appointment paperwork. Carolyn will process your appointment or contracts forms after your advisor has done the initial filing and you will find paper work in your Holdsworth mailbox to sign and return (to Carolyn)
- Help with Research grant accounting
- Questions about Grant and contract procedures and calculations

**Who: JOANNE BUCHANAN**

*Where:* Main office (offices to the left)

*What:* Joanne is the person to contact if you need:

- Extension-related purchasing
- Extension-related Accounting and Bookkeeping

**Who: JIL PROSCIAC**

*Where:* Main office (offices to the left)

*What:* Jill is the person to contact if you need:

- Coop-related purchasing
- Coop-related Accounting and Bookkeeping

*Who:* **DAN PEPIN**

*Where:* 1<sup>st</sup> floor Holdsworth (room)

*What:* Dan is the person to contact if you need:

- To fix minor repairs around Holdsworth
- To make or build project related materials
- Move your office or equipment in your laboratory. Dan has a variety of dollies and tools that may be borrowed at his discretion for use in the building

## 2.3 Office (desk) space

Regardless of whether or not you are supported on a research project, a teaching assistantship, or on your own, your advisor, via the GCC, is responsible for finding desk space for you on campus. Some students have desks in the lab space governed by their major advisor, and are scattered throughout Holdsworth Hall and the Conte Lab in Turners Falls, MA. However, most students occupy desks in the common spaces governed by the Program, which are: 1) Agricultural Engineering (Rm 109), 2) Agricultural Engineering Annex A, and 3) Hatch (Rm 2, 8 and 11). Allocation of common desk space is governed by the GPD and administered by Linda Fortin in the front office (Room 225). All students accompanied by their major advisor must see Linda to obtain a desk in the common space. Priority for desk space in these locations is dependent on a combination of how long you have been here, if you are a Teaching Assistant, and if you are currently taking classes. To find where a student's desk or office is located it is best to contact them directly by email or their advisor. Alternatively, Linda Fortin has a list of students and building maps if you run into trouble.

## 2.4 Keys

After you have been assigned a desk by the Graduate Program Director (via Linda Fortin), see Linda Fortin in the front office (Room 225) for instructions on how to get the keys you need. Keys often take several weeks to obtain, so don't be dismayed if you don't have immediate access to places you need to go. Note that the outside door key for Holdsworth NRC also opens the mail room door (Room 204) and the graduate computer room (Room 331).

## 2.5 Copy and Coffee Machines

If you need to copy something for your project, you might borrow your major professor's copying code/card for the copy machine located in the mail room (Room 204). Please don't use this machine for more than 50 pages of copying at any one time. If you need personal copies, you may borrow the Main Office card and pay 10 cents per page. Also, you may purchase (possibly with grant funds) a copy card at the Library which may be used on the copy machines in the Biological Sciences and Tower Libraries (but NOT in the Department's machine). Professional copiers in Amherst such as Collective Copies or Copy Cat can be used for bigger jobs.

Coffee/tea is available for 50 cents per cup in the mail room (Room 204). The refrigerator in the Mail Room is not for long-term storage, and all items that are not clearly marked as to ownership

will be discarded. It is also definitely not for project/research specimens; they can go in the walk-in freezers in Room 113 if properly labeled and registered (see your major professor for directions).

## 2.6 Phones and mail

Campus calls can be made on office telephones by dialing just the last 5 digits of the number. Locals calls can be made on office telephones by first dialing 9. If you need to make long distance calls as part of your project, ask your major professor for the Authorization Code for the project. To use it, dial \*6\*, Auth. Code, #, 9, 1, Area Code, Number. Do not make it easy for anyone else to use your Authorization Code! Note also that the project will be billed for long distance information (555-1212 numbers). There is a pay phone in the lobby for your personal non-local calls.

Upon first arrival to campus, you and your major advisor need to visit Linda Fortin in the front office (Room 225). Linda will assign you a mail box in the mail room (Room 204) with your name on it, and both professional and personal mail can be delivered there. For outgoing mail, regularly stamped mail will be picked up in the lower-most, lefthand-most mailbox. If postage is to be charged to a research account, get the account number from you major professor, stamp the envelope with that number, and put it in either of the two boxes immediately to the right of the regular mail box. Campus mail will be delivered if put into the box immediately right of those boxes. Packages that won't fit in these pickup boxes can be left on the floor immediately below the boxes.

## 2.7 Information technologies

Information technology services on campus, including computer and telephone services, are provided by the Office of Information Technologies (OIT)(<http://www.oit.umass.edu/index.html>)

*How do I obtain an OIT account?*

- You should receive a NetID and password when you are officially accepted into the Graduate school. Use the NetID to activate your OIT account at the following link: <https://spire.umass.edu>. You can change your password after the initial setup.
- When you establish your OIT account you will receive a UMass e-mail account (will look something like [JDoe@eco.umass.edu](mailto:JDoe@eco.umass.edu))

*What if I did not receive a NetID and password?*

- Contact the OIT office in LGRC A113, (413) 545-9400. You will need to go down the office to set up an account.
- Your NetID and password are used to access several of the services provided by OIT

*What services are provided by OIT?*

- Wireless web access on campus
- UMail--UMass e-mail interface
  - Send, receive, and manage your UMass e-mail account

- Storage limit 30 MB
- UMail attachment size limit is 5 MB
- You can forward your e-mail to any e-mail account
- Access UMail using supported e-mail servers such as Mozilla Thunderbird, Netscape, Outlook, Apple, and Entourage
- You can search for e-mail addresses of UMass students and faculty using the address book UMass directory search
- [https://mail-www.oit.umass.edu/horde/imp/nss\\_login.php?reason=login](https://mail-www.oit.umass.edu/horde/imp/nss_login.php?reason=login)
- UDrive
  - Web server used to store and share files, on and off-campus access
  - Available space: 250 MB per individual
  - <https://udrive.oit.umass.edu/xythoswfs/>
- SPIRE--Personal student center
  - Search and register for classes
  - Course schedule
  - Access your academic record
  - Check your finances (Brusar account, Financial Aid, etc.)
  - Change/edit your personal contact information
  - <https://spire.umass.edu/psp/heproda/EMPLOYEE/HRMS/?cmd=login>
- SPARK
  - Web server learning interface that uses the Blackboard Learning system software
  - Several professors use this website to post course information such as the syllabus, lecture material, grades, etc.
  - <https://spark.oit.umass.edu/webct/entryPageIns.dowebct>
- Statistical software and training
  - OIT offers students discounts on many software licenses for Macs and PCs. You can download OS system software, email programs, web browsers, Adobe products, and anti-virus software directly from: <http://www.oit.umass.edu/software/index.html>
  - Discounts on statistical software and licenses as well as instructional guides, software patches, and consulting services are available at: <http://www.umass.edu/statdata/>
  - OIT offers beginner and intermediate level workshops on how to use SAS and SPSS software. To get dates and times for the current semester go to A119 LGRC, telephone 545-9730 or <http://www.oit.umass.edu/workshops/general/index.html>
- Additional information about the services provided by OIT:
  - [http://www.oit.umass.edu/service\\_topic.html](http://www.oit.umass.edu/service_topic.html)

## 2.8 Graduate Computer Resources

NRC graduate students have their own computer room located in Holdsworth Room 331. The key to the exterior doors of Holdsworth open the door to the computer room. Keys can be obtained from Linda Fortin in the main office. There are 12 work stations, a printer, and Ethernet hook ups for laptops. All computers have internet access and hard drive space available for

students to save work on. The room also has dry erase and bulletin boards for group meetings and posting information.

*All computers have the following software:*

- Microsoft Office, Open Office, Canoco, Visual Basic

*There are a variety of GIS software available including:*

- ArcGIS, Quantum GIS, Rama GIS

*Statistical software include:*

- R, Simulistics, Stella, SAS

## 2.9 Library information

*What libraries are in the 5-College library system and how are they coded in the catalog?*

- Amherst College
  - Keefe Science Library (AC Science)
  - Robert Frost Library (AC Frost)
- Hampshire College
  - Harold F. Johnson Library (HC Library Center)
- Mount Holyoke
  - Williston & Miles-Smith Library (MH Main Library)
- Smith College
  - Neilson Library (SC Neilson)
  - Young Science Library (SC Young)
- UMass Amherst
  - Integrated Sciences and Engineering Library (UM Science)
    - Primary location for Natural Sciences, Biology, etc. on campus
    - Generally closed at 9:00 p.m. during the week
  - W.E.B. Du Bois Library (UM W.E.B. Du Bois)
    - UMass main campus library
    - Open 24hrs.
    - Secondary location for Natural Sciences resources

*What services are offered with my library account?*

- General library account
  - Use your library barcode to access account online
  - Check on books that you have loaned
  - Renew items online
    - Check on status of requests from the 4 other college libraries in the system; you can specify which library on campus you would like your requests sent
  - Link: [http://fcaw.library.umass.edu:8991/F/?func=BOR-INFO&local\\_base=fcl01uma](http://fcaw.library.umass.edu:8991/F/?func=BOR-INFO&local_base=fcl01uma)

- Interlibrary Loan and Document Delivery (ILLiad)
  - *When do I use ILL?*
    - If you are unable to find an item in the 5-College library catalog use ILL to request the item
    - Depending on the format of the material it will be sent to you electronically or delivered to your specified library location
    - You can also use ILL to order a copy of journal articles from the other 4 college libraries
  - *When not to use ILL*
    - Do not use ILL to request items located in the other 4 college libraries. Instead you will click on “request item” in the library catalog. It will be delivered to your specified UMass library location
  - *When can I use Document delivery (library express) service?*
    - When you are requesting items from UMass library locations
    - You can request items to be sent to you electronically or delivered for a \$5.00 fee
  - Link: <http://www.library.umass.edu/services/ill/index.html>
- RefWorks citation manager
  - Citation manager software that can be used on and off-campus
  - Refworks can be used to collect, store, and organize citations from books, articles from databases, web sites, and other sources
  - You will need to set up an account to use RefWorks
  - Link: <http://www.library.umass.edu/reference/refworks/index.html>

*How long can I loan books and bound periodicals?*

- Loan period for books is 28 days for Graduate students and 180 for Doctoral
- Bound periodical can be loaned for 24 hrs.

## 2.10 Textbooks

*Where can I purchase textbooks or other materials for courses locally?*

- Your course professor may have requested textbooks from the following local locations
  - Jeffrey Amherst Books
    - <http://jeffbooks.com/home2.html>
  - Amherst Bookstore
    - <http://www.amherstbooks.com/Textbooks/index.html>
  - UMass Textbook Annex
    - <http://www.bkstr.com/CategoryDisplay/10001-10001-10571-1?demoKey=d>
- UMass Extension Bookstore
  - <http://umassextensionbookstore.com/catalog/>

## 2.11 Graduate Employee Organization (GEO)

If you are a Teaching Assistant (TA), Teaching Associate (TO), Research Assistant (RA), Project Assistant (PA), Assistant Resident Director (ARD), Intern, Trainee, or Working Fellow you can become a member of the Graduate Employee Organization (GEO) and be covered by GEO stipends and benefits. GEO is a unit of the [United Auto Workers \(UAW\) Local 2322](#), which is based in Holyoke. We are not the only graduate students affiliated with the UAW – Umass Boston, Umass Lowell, the University of Washington and the entire University of California system are too. Umass Amherst graduate students have been unionized since 1990.

*What does GEO do?*

The main task of GEO is to negotiate a contract with the University Administration that determines wages and benefits for graduate student employees. This is usually a major undertaking and requires many meetings, negotiations, and usually several rallies.

*What benefits and assistance does GEO provide me with?*

- Tuition and curriculum fee waivers
- Dental and vision plans
- Discounted Health Insurance
- Help resolving workplace conflicts

*How do I become a member?*

To be a voting member of GEO, you must check off the box for membership on your Dues Deduction Form. This form is sometimes attached to your assistantship contract, or you can sign it at the new employee orientation hosted by the Graduate School, or you can pick one up in the GEO office in room 201 of the Student Union. Dues are 2% of your salary. For employees with a 20 hour/week assistantship contract, this works out to about \$6 a week. Graduate employees who choose not to join the union must pay an "Agency Fee," as established under state law. This amount is recalculated each year.

*How many hours a week do I need to work in order to receive a tuition and fee waiver?*

In general, if you work 20 hours per week in either semester you will receive a full year's tuition and fee waiver. If you work one 10-hour appointment in the fall and one 10-hour in the spring you receive a full year's tuition and fee waiver. If you work one 10-hour appointment per year then you will get a waiver for one semester.

*How many hours a week do I need to work in order to receive health insurance?*

Health insurance is provided by the University. Anyone eligible for a tuition waiver also gets Basic health care coverage. In general, working one 20 hour appointment per year will give you Basic and SHIP coverage at a reduced rate for the entire calendar year. Working one 10-hour appointment per year will give you 95% waivers for Basic and SHIP fees for one 6-month coverage period. Working one 10-hour appointment in the fall and one 10-hour in the spring will earn you waivers for Basic and SHIP fees for the whole year. Check the website for information about Family and Domestic Partner Coverage.

*How do I sign up for the Dental and Vision Plans?*

These plans are administered through the Union. You must sign up for these plans every year generally by early October. Check the website for details.

*What if my funding comes from a non-University source?*

As long as your paycheck comes from the University of Massachusetts, you are eligible to be a member of GEO.

*If I elect to pay the Continuation Fee (formerly known as the Program Fee) am I still eligible for benefits?*

Again, as long as your paycheck comes from the University of Massachusetts, you are eligible to be a member of GEO. You are still eligible for benefits, but you must go to University Health Services to sign up for health insurance in person before the add/drop period of each semester.

*Do I have access to any discounts as a GEO member?*

Yes. Check the Union Discounts page of the website for more details. You also get discounted parking. Remember to bring a copy of your contract with you when you purchase your parking permit. Check the parking services website for current fees.

<http://parking.umass.edu/index.php/home/>

*What should I do if I have a problem in my workplace or with my insurance provider?*

If you feel that any portion of the contract is being violated, you can contact the NRC steward or the GEO office and speak with a staff member about your options.

*How can I get involved in GEO?*

- Read over the current contract so you know what benefits you are entitled to.
- Check out the website <http://www.geouaw.org/>
- Go and find the GEO office in room 201 in the Student Union. There are always friendly people there to answer your questions.
- You will get GEO emails. Read them to stay on top of what's going on.
- Attend the membership meetings and social gatherings. They are a great way to meet people from other departments.
- Support the hard work that the GEO officers do by going to a rally, even if you don't feel particularly educated about the issue. People will fill you in once you get there.

## 2.12 Graduate student fees

You are GEO eligible for one semester if you earn the equivalent of a 10-hr TA or RA (\$3467.5 as of spring 2008) in that semester. For 2 semesters if you earn twice that in a year (can be earned all in one semester or split between the two). Basically you need 10 hrs per week of teaching or research assistantship. Many fees are waived for GEO eligible students but not all. Paying spring fees also covers summer enrollment in health coverage.

Different options for GEO eligible students and the associated fees (as of spring 2008), all subject to change with each academic year:

1. Continuation fee (formerly known as Program Fee) - If you are taking no classes you can enroll in just the continuation fee of \$275. You can do this through spire by enrolling in class #57092 (but check spire for changes in class number each semester).
2. 1-4 Credits - \$222 Service Fee + \$50 Graduate senate tax = \$272
3. 5-8 Credits - \$388 Service Fee + \$50 Graduate Senate Tax = \$438
4. 9+ Credits - \$545 Service Fee + \$50 = \$595

*Important considerations:*

- If you register for Continuation fee or are taking less than 8 credits and wish to be considered a full time student you must get the GPD to send a memo to the graduate school saying the department considers you a full time student. You will also need this memo to be eligible to receive student loans.
- You must register full-time (9 credits) for 2 semesters to be eligible for graduation. When considering registering for the Continuation fee opposed to credits, make sure you meet this requirement.
- GEO eligible students pay 5% of the health plan costs. That works out to around \$70 a semester. If you are taking less than 5 credits or on program fees you must re-enroll in person at the health center at the beginning of each semester. If you are taking more than 5 credits you should be automatically enrolled in the health plan, but you might still want to check with the health center. You must go and pay your health fee and sign a form in the beginning of the semester to get your insurance for that semester if you are on continuation fee.
- In addition to the above fees there is a \$332 entering student fee that you must pay your first semester.

*Fee Minimization Strategies:*

- After you've decided how what classes your taking it costs you nothing more to add thesis/dissertation credits up until just below the next fee threshold (make your total credits for the semester 4 or 8). Just make sure to get a memo saying you're a full time student and don't forget to enroll in the health plan.
- Similarly if you have over 9 credits in classes you don't pay anything more for adding additional thesis/dissertation credits. There's a maximum of 16 per semester (or 18 with GPD approval).
- If you're not taking any classes in a semester realize that the cost of enrolling in 4 thesis/dissertation credits is pretty much the same as the program fee. Similarly the cost of taking a single class (3 or 4 credits) is pretty much the same as the cost of taking no classes.
- Master's students can count a maximum of 10 thesis credits towards their degree (need a minimum of one) and need 30 credits total. PHD students need at least 10 dissertation credits.
- It's possible to get your fees deducted from your paycheck over the course of the semester. This must be set up far in advance (previous semester). To do this you have to print the payroll deduction form available on the bursar's website (<http://www.umass.edu/bursar/>), fill it out, and hand it in at the bursar's office.

- Currently you cannot pay your bill (this may change) by credit card so note that you will have to pay your semester bill by check or cash or pay it in parts over the semester and be charged a \$50 late fee.

*Additional Resources:*

- The Graduate School (<http://www.umass.edu/gradschool/>)
- Graduate Records, Registration, and Transcripts, 534 Goodell Building Phone: (413-545-0024; 8:30 AM - 5:00PM M-F)
- GEO (<http://www.geouaw.org/>)

## 2.13 Seminar series offered in NRC and other related departments

The Department of NRC offers a weekly seminar series (<http://NRC.umass.edu/nrc/>). You are required to enroll in this course (NRC 691A) at least one semester, but are expected to attend seminar every semester you are on campus. There are a variety of other department seminars that may be of interest to you:

- Food Science (<http://www.umass.edu/foodsci/gradSeminar.html>)
- Microbiology ([http://www.bio.umass.edu/micro/seminars\\_dept.html](http://www.bio.umass.edu/micro/seminars_dept.html))
- Plant, Soil and Insect Sciences (<http://www.umass.edu/psis/seminar/seminar.html>)
- Resource Economics (<http://www.umass.edu/resec/seminars/index.shtml>)
- Veterinary and Animal Sciences (<http://www.umass.edu/vasci/graduate/seminars.html>)
- Landscape Architecture and Regional Planning ([http://www.umass.edu/larp/lecture\\_series.html](http://www.umass.edu/larp/lecture_series.html))
- List of Life science seminars compiled by the Biology Department (<http://www.bio.umass.edu/biology/seminars.phtml>)
- Organismic and Evolutionary Biology Seminars (<http://www.bio.umass.edu/oeb/seminars>)

## 2.14 Graduate Program Meetings

The Program holds meetings for all NRC graduate students once a month during the academic year on the first Monday of the month at 5:00 pm in Holdsworth (either 312A or 308). The purpose of these meetings is several fold: to build and promote a sense of community among students in the Program; to provide an opportunity for students to learn about the research and professional projects of other students; and to provide a regular opportunity for socializing over free food and drink. Each month a single student is asked to present a non-technical description of their research or professional project, with an emphasis on telling the story behind the story; i.e., how they got into the Program and got interested in the particular project, how they figured out how to tackle the particular problem, interesting things they learned about the problem as a result of their work, and other fun stories about their work that would not be appropriate for a scientific presentation. Following the presentation and ensuing Q&A, there is a social hour during which free food and drink are provided.

While you are not required to attend these meetings, you are strongly encouraged to do so. These meetings, after all, are for your benefit and provide you a great opportunity to get fully engaged in the Program and make the very best of your UMass experience.

## 2.15 Quantitative Sciences Group and Consultations

The Quantitative Sciences Group (QSG) is an ad hoc committee of the NRC Graduate Program whose goal is to improve quantitative literacy in ecology and conservation among graduate students and faculty of NRC. Quantitative literacy is the ability to understand and effectively apply quantitative methods, which is becoming increasingly important in ecology and conservation science.

### *What is the Scope of QSG?*

The realm of quantitative sciences in ecology and conservation includes an exceptionally broad range of topics and methods. However, based on the experience, expertise, and anticipated needs of graduate students and faculty in NRC, QSG focuses on the following areas as they apply to ecology and conservation:

- Study design
- Ecological statistics
- Spatial data analysis
- Systems modeling

### *What are the Objectives of QSG?*

With the overall goal of improving quantitative literacy in ecology and conservation among NRC graduate students and faculty, QSG has two principal objectives:

1. Design and teach quantitative sciences courses to NRC graduate students – to this end, QSG offers a four-semester sequence of courses on the design and analysis of ecological data (see course listings), in addition to the regular periodic offerings of courses on specialized topics in spatial data analysis and systems modeling.
2. Provide quantitative sciences consultation to NRC graduate students and faculty - to this end, QSG is available every Monday 2:00-4:00 p.m. in 304 Holdsworth Hall for scheduled consultations to offer advice in the areas of study design, analytical methodology and interpretation of results. Details on this consultation service are provided elsewhere (e.g., posted outside rm 304).

### *What are QSG Consultations?*

The Quantitative Sciences Group (QSG) offers free consultations to NRC graduate students and faculty in the areas of study design, analytical methodology and interpretation of results. The purpose of these consultations is to improve quantitative literacy in ecology and conservation science among graduate students and faculty in NRC. Consultations are for advice only – take it or leave it. For graduate students, QSG advice does not override the guidance and/or requirements of the thesis/dissertation advisory committee. Ultimately, the student consultee is fully accountable for all decisions made and thus must be able to fully explain and defend all quantitative aspects of their research.

*Who is Eligible for QSG Consultation?*

All graduate students and faculty in NRC are eligible for consultations. However, the experience, expertise and focus of QSG is on ecology and conservation science. Individuals seeking advice in other realms of natural resources conservation, for example dealing with the social sciences, resource economics, business management, etc., are probably better served elsewhere.

*How to Schedule a QSG Consultation?*

QSG consultations are available every Monday 2:00-4:00 p.m. in 304 Holdsworth Hall during the academic session. Consultations must be scheduled in advance; walk-ins between the hours of 2:00-4:00 are not allowed. To schedule a consultation, sign up on the consultations sign-up sheet outside of 304 Holdsworth prior to 2:00 p.m. on Monday and complete the QSG consultation form (available outside of rm 304).

**2.16 Animal Use Protocol / Research Permits**

If you will be conducting research on vertebrate animals, you must be an approved Animal Use Protocol on file in the Animal Care Office on Campus (Research Administration Building; 5-0668; [iacuc@resgr.umass.edu](mailto:iacuc@resgr.umass.edu); <http://www.umass.edu/research/aco/>)

- Your major professor may already have prepared a protocol and had it approved, but you need to make sure you have a copy.
- If one has not been prepared, you will need to collaborate with your major professor to prepare one and have it approved prior to any affiliated research.
- The IACUC requires that all personnel listed in an animal use protocol that have contact with living vertebrate animals receive appropriate training for animal users, including graduate and undergraduate students.
- Potential field technicians must go through the training as before starting work on a project.
- The Compliance Coordinator conducts monthly one-hour classroom training sessions for new animal users that meets federal requirements. All animal users must take the animal users' update training each year on or before the anniversary of their first training.
- All State or Federal permits must be approved and in hand prior to official IACUC approval

*When should I peruse this?*

The best time to submit your IACUC forms would be as soon as you have completed your research proposal. This is because the IACUC committee only meets so many times a semester, and if you miss a review date you will be delayed until the next period of review.

- If your proposal gets rejected for some reason you may have to wait longer.
- Forms are available on the web and are very specific. Any further questions should be brought to your advisor and the IACUC office.

**2.17 Travel Grants**

If you travel to a conference and present either a poster or oral paper, you are eligible to apply for a Graduate Student Travel Grant. Grant funds may be applied to registration, transportation,

and lodging expenses documented by receipts for up to \$200 for regional, \$300 for domestic, and \$400 for international travel. Meals, copying, and other incidentals are not reimbursable.

You need to coordinate your travel grant application with the GPD and your advisor. The travel grant guidelines are available in full from the Graduate School website (<http://www.umass.edu/gradschool/Travel/>).

The Department of NRC is allocated exactly **four** travel grants per year based on our current student enrollment. This number is fixed and the recipients are determined by the GCC's and GPD. The procedure for applying for one of these travel grants is as follows:

1. On or before **September 15** (for travel occurring September 1 - February 28) or **March 15** (for travel occurring March 1 - August 31), submit to your respective GCC the Graduate Student Travel Grant Application (form available from the graduate school website at <http://www.umass.edu/gradschool/Travel/>).
2. The GCCs and GPD will evaluate the applications and decide on two recipients for this 6 month period.
3. The GPD will contact the recipients and instruct them to submit their application to the Travel Grant Program according to the instructions on line.
4. After returning from the trip, the graduate student submits all travel receipts to the program administrative assistant (Lori Miner) within **3 weeks** of travel.

## 2.18 Student societies and professional groups in NRC

If you cannot locate a meeting time or contact for the student chapter, it is best to contact the “faculty advisor” or another member of the faculty who is studying in that general area of research. In some cases the club may be inactive. You could always revive it!

- The Wildlife Society – The Wildlife Society (TWS), founded in 1937, is an international non-profit scientific and educational association dedicated to excellence in wildlife stewardship through science and education. Our mission is to enhance the ability of wildlife professionals to conserve diversity, sustain productivity, and ensure responsible use of wildlife resources for the benefit of society. Advisor: [Curtice R. Griffin](#)
- American Fisheries Society —The American Fisheries Society (AFS) is the world's oldest and largest organization dedicated to strengthening the fisheries profession, advancing fisheries science, and conserving fisheries resources. Advisor: [Francis Juanes](#)
- Society of American Foresters – Since 1900, the Society of American Foresters has provided access to information and networking opportunities to prepare members for the challenges and the changes that face natural resource professionals. Advisor: [David B. Kittredge, Jr.](#)
- Forest Products Society – The Forest Products Society is an international not-for-profit technical association founded in 1947 to provide an information network for all segments of the forest products industry — from standing tree to finished product. Advisor: [David T. Damery](#)
- National Association of Home Builders – NAHB is a Washington, D.C.-based trade association whose mission is to enhance the climate for housing and the building industry. Chief among NAHB's goals is providing and expanding opportunities for all consumers to

have safe, decent and affordable housing. As “the voice of America’s housing industry,” NAHB helps promote policies that will keep housing a national priority. Advisor: [David T. Damery](#)

## 2.19 Campus Recreational Facilities

*Do I need a membership to use the recreational facilities?*

YES. Graduate students need a membership to access the sports and recreation facilities, participate in Fitness and Wellness programs, and intramurals. More information on the recreational facilities, including class offerings, hours of operation, etc. can be found at their website:

<http://www.umass.edu/campusrec/index.html>

- Your UCard is used as a membership ID
- The fee for Graduate Students is \$150 per semester (outrageous and always subject to change). There are additional fees to participate in the Fitness and Wellness Programs (Yoga, Cardio blast, Kickboxing, etc.)

*Where do I purchase a membership?*

- Campus Recreation office in 215 Boyden

*What fitness facilities are available?*

- Fitness centers (Recreational Center, Boyden and Totman)
- Pools (Boyden, Totman and Hicks)
- Gymnasiums (Recreational Center, Boyden and Totman)
- Squash and handball courts (Recreational Center, Boyden, Mullins Ice Rink)
- Tennis courts (Behind Mullin Center)

Totman is the closest facility to Holdsworth. The recreation gym is small, but there a second facility run by the Kinesiology Department called the Body Shop. It costs a little more but may be worth it to avoid crowding. It also has newer equipment. The Recreation Center (open Fall 2009) is a new state-of-the-art facility with almost everything you might need, including weights, stationary devices and aerobic class rooms.

### 3. THE PROGRAM

#### 3.1 General Policies and Administrative Requirements

##### *3.1.1 Academic Honesty*

Read and understand sections VIII Academic Honesty Policy and IX Graduate Student Honor Code found in the Graduate Student Handbook. Also, all graduate students should try and obtain a copy of: Sigma Xi. 1986. Honor in Science. The Scientific Research Society, Research Triangle Park, NC, 41pp.

##### *3.1.2 Publishing*

It is expected that your research or special project work will lead to publication in refereed journals. In spite of the fact that Master's Theses and Doctoral Dissertations may be copyrighted, you and your major professor have a responsibility to make sure your work is indeed published and made accessible to the broader scientific community.

Normally, you should write the articles stemming from your work. It is generally expected that your major professor will be included in the author list even if you have done most of the writing. If a year passes after your final defense and the appropriate rough draft(s) is still not written, your major professor is entitled to write the article and assume first authorship even though you have the copyright to the dissertation or thesis. Determining who should be included and in what order in the author list is sometimes a problem. R. H. Schmidt (Bull. Ecol. Soc. 68:8-10, 1987) gives a worksheet approach to help determine the relative contributions to the five areas of "conception, design, data collection, data analysis, and manuscript preparation." R. A. Day (see reading list) asks "And what do these colleagues do when everything suddenly falls into place as a result of a searching question by the traditional 'guy in the next lab' who had nothing whatever to do with the research?" J. G. Dickson et al. (Wildl. Soc. Bull. 6:260-261, 1978) suggest "if the professor conceives and designs a project and is instrumental in other areas, he should be the first author." In short, it is a tricky business, one that should be discussed at length with your major professor. In general, our advice is to do it her/his way as you have too much at stake to risk a fight over this issue. After you leave your program of study you can "do it your way..."

All oral and poster presentations and publications should acknowledge sources of funding and other support behind the research.

For thesis/dissertation degree students, the department expects a digital copy of your thesis/dissertation in pdf format for the departmental archives and website. Your paperwork may be held up by the GCC, GPD or Department Head if you don't provide one. Also, you should provide your major advisor a copy of your thesis/dissertation on computer disk in a common word processing format.

##### *3.1.3 Statute of Limitations*

The Graduate School expects you to finish your program in a timely manner which means within three years for the MS and within four years for the PhD (assuming the candidate already has the

MS). The first extension is granted automatically, but your major advisor must notify the GCC of this request so that he/she can notify the Graduate School of the extension. A second extension requires a special petition to the Graduate School. To do this, you must write a memo to your major professor that summarizes your progress and the difficulties causing the need for an extension. Your major professor will send a cover memo to the GCC supporting the request, and the GCC will normally forward a copy of this memo as an attachment to his/her notification or request for the SOL extension.

### *3.1.4 Stipends and Tuition Waiver*

Most research students in the program will receive monetary support in the form of a teaching assistantship (TA) or research assistantship (RA). The amount of this varies somewhat among students, but is usually sufficient (i.e., 10-hr/week TA) to merit a tuition and partial fee waiver. Note, you must be appointed on a TA or RA amounting to at least 10 hr/week to qualify for a tuition waiver. It is your major professor's responsibility to expedite your appointment as an RA or TA with the office. If you and your major professor do not arrange for an assistantship, you will be responsible for paying tuition, with one exception. If you are receiving a stipend from another source equivalent to a 10-hr TA/RA for work directly related to your academic program, you can apply for a tuition waiver. For this option, you must complete a special form (obtained from the front office) documenting your employment and verifying that the work and stipend are directly related to your academic progress. The form must be signed by your employer and accompanied by a letter from your sponsor on letterhead describing the work to be completed, the amount you will be paid and the period (start and end date) over which the work will be completed. In addition, this form and accompanying letter from the sponsor must be submitted separately each semester.

If you don't receive a payroll or expense check when you expect it, don't delay in asking your major professor to help you. Do not go and ask about your stipend in the Main Office unless your major professor has specifically instructed you to do so.

### *3.1.5 Full-time Status*

Any semester that you are not enrolled full-time (at least 9 credits) for course work, including thesis or dissertation credits (e.g., during semesters you are in the field conducting research), you may need to request full-time status from the GCC, for example to be eligible to receive fellowships, scholarships and student loans. Your major advisor must request a memo from the GCC to the Graduate School stating that you are indeed a full-time student despite your under enrollment, and this should be done prior to the last day of add/drop for the semester. Note, there is a full-time status form that you can download from the graduate school website and complete for the GCC's signature to expedite the process. Note, this does not have to be done during the summer months.

### *3.1.6 Continuation (Program) Fees*

If you are not enrolled for any credits, including thesis or dissertation credits (e.g., during semesters you are in the field/lab conducting research), you must still register for the Continuation (Program) Fee only; otherwise, the Graduate School will automatically drop you from the program. Specifically, to register for Continuation Fee only you must enroll (via

SPIRE) in the following: GRADSCH 999 (note, the specific schedule # changes each semester, so check on SPIRE), and you will need to enroll before the last day of add/drop.

Importantly, if you are paying continuation fee only (i.e., not enrolled for course credits, including thesis or dissertation credits) OR you are signed up for less than 5 credits (including thesis or dissertation credits), then you must physically go to the Health Center and sign up for Health Insurance at the beginning of each semester, otherwise it will be dropped automatically. Health Insurance is only automatically carried forward if you are signed up for 5 or more credits.

### 3.2 Core Area Requirements

The Program expects all students to obtain breadth of knowledge in environmental conservation; all students are expected to demonstrate this during the Comprehensive Exam (see “Comprehensive Exam”). To accomplish this, MS students are expected to complete course work in each of the core topic areas listed below; specifically, students are expected to take at least one 500-level or above course in each of the core topic areas, although 600-level courses are strongly encouraged if they are available (see Appendix A for a list of NRC courses offered in each of the core topic areas). PhD students are expected to obtain the necessary core knowledge, but there are no specific requirements for completing courses in each of the core topic areas. Note, it is important to realize that you are not expected to know everything there is to know in each of the core topic areas – no one, including your committee members, has this breadth and depth of knowledge. However, you are expected to obtain a certain minimum mastery of material in each core topic area. Given the breadth of information associated with these broadly defined topic areas, it is the responsibility of the committee to determine the specific background, knowledge and level of competency expected of you in each core topic area. Clearly, the expectations for PhD students are going to be much greater than for MS students.

#### *Core Area 1: Core science (biology, ecology, conservation & environmental building design)*

It is mandatory that environmental conservationists and/or designers have a sound understanding of the biological, ecological and environmental building systems with which they are dealing and the conservation of those systems. Thus, you are expected to have an understanding of one or more of the following topic areas:

- A. Principles of evolution and the manner in which natural selection functions; systematic principles and the systematics of the taxa in your field of study.
- B. Organismal biology.
- C. Ecological interactions and relationships of individuals, populations and communities.
- D. Systems and/or landscape ecology and its function in the analysis of ecological systems.
- E. Management/conservation of populations, communities and ecological systems.
- F. Sustainable building systems

#### *Core Area 2: Quantitative and physical sciences*

It is mandatory that environmental conservationists and/or designers be well versed in the quantitative methods used to study and manage ecological and environmental building systems. They must be broadly versed in knowledge of specific techniques of assessment and of the

management of habitat (natural or human), species, communities and landscapes likely to be encountered during their work. Only then can they properly address the problems of environmental conservation. Thus, you are expected to have an understanding of one or more of the following topic areas:

- A. Experimental design and the use of the scientific method.
- B. Modeling.
- C. Individual, population, community and/or landscape assessment.
- D. Statistical analyses.
- E. Remote sensing.
- F. Geographic information systems.
- G. Green building analysis and design

*Core Area 3: Human dimensions (resource values, policies, programs and economics)*

Conservation is an expression of social values assigned to specific resources and the systems that support them. These values are manifested primarily through various forms of social action in public policies, laws and organizations. It is necessary that environmental conservationists and/or designers have a critical understanding of the historical and contemporary social, economic and political conditions that have and do foster conservation efforts for resources and the environment. Thus, you are expected to have an understanding of one or more of the following topic areas:

- A. The social and scientific history of environmental conservation.
- B. Current major policies and laws that direct federal, state and local government conservation activities.
- C. Commonly used methods for measuring and evaluating social values (i.e., economic, anthropological, political).
- D. The structure and function of social organizations (public + private) engaged in environmental conservation.
- E. Efforts to create interdisciplinary or interagency actions in environmental conservation (i.e. land use planning, river basin organization, environmental impact assessment).
- F. Management and marketing of sustainable building practices

### **3.3 Academic requirements**

The NRC Program requirements are in addition to but do not supersede Graduate School guidelines set forth in the Graduate School Bulletin, the Graduate School Grievance Procedures for Graduate Students, and the Graduate School Handbook.

### 3.3.1 MS Thesis Degree

Requirement	Graduate School	NRC Program
Total graduate credits	Minimum of 30	Same
Credits in major	Minimum of 21	Major fields include NRC, BIOL, etc.
600-800 level credits	Minimum of 12	Same
Independent study credits	Maximum of 6	Same
Letter grades	Half of credits must be letter grades, rest P/F with GCC approval	Same
Thesis credits	From 1 to 10	Same
Transfer credits	Maximum of 6	Same
Credits per semester	Maximum of 16	9 is considered a full load
Required courses & seminars	None	Must complete NRC 601 (research concepts), NRC 791S (communicating science—speaking), NRC 791W (communicating science—writing), NRC 697 (design and analysis of ecological data), one semester of NRC 691A (departmental seminar), and one 500-level or higher course in each of the core topic areas. Note, substitutions for required courses requires GCC approval. See additional course requirements for each degree concentration in appendix C.
Comprehensive exam	None	Required; see details in section on “Comprehensive Exam”

### 3.3.2 *PhD Degree*

Requirement	Graduate School	NRC Program
Total graduate credits	None beside dissertation	Only those determined by your committee beyond the 10 dissertation credits (below)
Dissertation credits	10	Same
Transfer credits	Maximum of 6	Same
Credits per semester	Maximum of 16	9 is considered a full load
Residency	2 consecutive full-time ( $\geq 9$ credits) semesters	Same
Required courses & seminars	None	Only those determined by your committee as needed to pass your comprehensive exam
Comprehensive exam	Must complete to become PhD "candidate"	Required; see details in section on "Comprehensive Exam"
Teaching experience	None	Must teach or assist in teaching at least one semester. Outside experience at college level may apply

### 3.3.3 MS Professional Degree

Requirement	Graduate School	NRC Program
Total graduate credits	Minimum of 30	Same
Credits in major	Minimum of 21	Major fields include NRC, BIOL, etc.
600-800 level credits	Minimum of 12	Same
Independent study credits	Maximum of 6	Same
Practicum	None	6 credits (see details in section on “Practicum”)
Internship	None	12-week long (associated with Practicum), if not already professional employed
Letter grades	Half of credits must be letter grades, rest P/F with GCC approval	Same
Transfer credits	Maximum of 6	Same
Credits per semester	Maximum of 16	9 is considered a full load
Required courses & seminars	None	Must complete NRC 601 (research concepts), NRC 791S (communicating science—speaking), NRC 791W (communicating science—writing), NRC 697 (design and analysis of ecological data), one semester of NRC 691A (departmental seminar), and one 500-level or higher course in each of the core topic areas. Note, substitutions for required courses requires GCC approval. See additional course requirements for each degree concentration in appendix C.
Comprehensive exam	None	Required; see details in section on “Comprehensive Exam”

### 3.4 Examination/Advisory Committee

#### *3.4.1 MS Degree (thesis and professional degree concentrations)*

You need at least three (but more is OK) Graduate Faculty (as named so by the Graduate School) on your committee. The Chair (almost always, your major professor will serve as chair) must be a member or adjunct member of the NRC Graduate Faculty. A second member must also be a member or adjunct member of the NRC Graduate Faculty. At least one member must be principally affiliated with a different area of concentration from your own (i.e. an “outside” member). For example, if you are affiliated with the Wildlife and Fisheries Conservation concentration, the third member can be affiliated with the Forest Resources concentration, Green Building concentration, etc., or from any other department within the five college system. At least one member of the committee must be a regular University employee (i.e., not an adjunct faculty member). UMass Research Associates (holding an MS degree at a minimum) are eligible to serve as members on MS committees, but not PhD committees. People not listed as UMass Five College Graduate Faculty (e.g., faculty from other institutions or individuals from agencies or industry that hold PhD’s) can be included as “Consultants” (i.e., non-voting) or “Members” (i.e., voting), but cannot replace any of the three required Graduate Faculty members. If such people are included as full “Members”, the GCC (via the GPD) has to forward a memo to the Graduate School (along with the curriculum vitae, social security number, and date of birth, which is required with either title) to convince them to allow it. The Graduate School prefers such people to be named as Consultant. Your major professor must forward the list of names to the GCC so s/he can write the appropriate memo to the Graduate School. Your graduate committee is not officially formed until this memo has been sent to the Graduate School. You must have an approved committee before you can submit your thesis proposal.

#### *3.4.2 PhD Degree*

The PhD committee requirements are identical to the MS requirements listed above, with the following modifications. While you need at least three committee members, four or five is generally recommended for PhD students. At least one member must be an “outside member”, defined by the graduate school as a UMass Five College Graduate Faculty member not in your department. Note, your major professor must forward the list of names to the GCC so s/he can write the appropriate memo to the Graduate School. Your graduate committee is not officially formed until this memo has been sent to the Graduate School. You must have an approved committee before you can submit your dissertation proposal.

### 3.5 Comprehensive Examination

The Program requires all students to pass a Comprehensive Exam (also sometimes referred to as the “General Exam” for MS degrees and the “Preliminary Exam”, or just “Prelims”, for PhD degrees). The purpose of the exam is several-fold. First, it is intended to serve as a stimulus to force you to review and synthesize your existing knowledge base. Second, it is intended to allow the committee to evaluate your knowledge base and identify possible deficiencies you may have in the core topic areas, and subsequently recommend or require you to complete additional coursework and/or independent study, and possibly retake the exam if you fail. Third, if you fail the comprehensive exam and/or a retake of the exam, it provides a mechanism by which you will lose your status as a candidate for a degree (see “consequences of failure” below).

### 3.5.1 MS Degree (*thesis and professional degree concentrations*)

The Program requires all MS students to pass a Comprehensive Exam. The Comprehensive Exam is an NRC graduate faculty assessment procedure to determine whether you have met the academic standards of the program and shall proceed to the final stage of your program – the defense of your thesis or professional paper. You will not be eligible to defend your thesis or professional paper until you have passed the Comprehensive Exam. You and your major professor are responsible for deciding when you should take the exam. Normally, the exam will be given at the end of your second full year after completing any required or recommended course work needed to fulfill the core area requirements (see “Core Area Requirements”).

The Comprehensive Exam consists of a written exam administered once each semester by the GPD according to the following procedures:

- The GPD will publish a list of terms & topics at the beginning of each academic year. The terms and topics will be organized into core topic areas (see “Core Area Requirements”) and degree concentrations (see appendix C) and will include a “general” category that encompasses material from the core courses required of all graduate students in NRC.
- On a single designated day and time each semester, the GPD will administer the comprehensive closed-book exam.
- The exam will consist of a set of questions pertaining to terms and topics randomly drawn from the list made available at the beginning of each academic year. More specifically, the exam will be comprised of questions in four topic areas: 1) general, 2) your concentration within environmental conservation, 3) quantitative and physical sciences, and 4) human dimensions. Note, the second topic area will be limited to your designated concentration area. For example, if you are in the Wetlands Conservation professional degree concentration, your questions will be drawn from the corresponding terms and topics.
- Each subject area of the written exam will be graded by a single faculty member, designated by the GPD, to ensure consistency in evaluation. Each question will be awarded 0-2 points: 0 = no credit; 1 = partial credit; 2 = full credit.
- A 70% score or greater is required to “pass” each topic area, and all four topic areas must be passed separately in order to “pass” the exam.
- After the evaluation of the exam, the GPD will send the results (PASS or FAIL) to your GCC for record keeping purposes (exam\_outcome.doc).
- *Consequences of failure.*--If you fail to pass any one of the topic areas, then you have failed the exam and must retake that portion of the exam at another date and time within four weeks of notification of the exam results, as designated by the GPD. Note, the second exam will be only in the area(s) failed. If you fail any of the topic areas during the second exam, then you have failed the exam and you will lose your status as a student in the NRC program at the end of the current semester.

### 3.5.2 PhD Degree

The Graduate School and the NRC program both require all PhD students to pass a Comprehensive Exam. The comprehensive exam is a graduate faculty assessment procedure to determine whether a PhD *student* shall proceed as a *candidate* with a dissertation study. A

graduate student shall not be considered a candidate for a PhD degree until they have passed the comprehensive exam.

All comprehensive examinations consist of both a written exam and a separate oral exam and shall be conducted according to the following procedures:

#### *Written Exam*

- The written exam shall be given by your approved examination/advisory committee. Note, the written exam cannot be given until you have an approved examination/advisory committee. Your major professor will forward a memo to the GCC recommending members of the Examination/Advisory Committee (see “Examination/Advisory Committee”).
- Your major professor is responsible for initiating the process by coordinating with the GCC at such time as you and s/he feel you should take the exam. The Graduate School is not notified. Normally, the exam will be given at the end of your second full year after completing any required or recommended course work needed to fulfill the core area requirements (see “Core Area Requirements” below). The Committee and you will agree on appropriate dates for the exams (oral and written) at least one week ahead of the written exam. The announcement of the written exam goes only to the Examining Committee and you.
- Your major professor shall solicit questions from all the members of the Examining Committee. The exam may be conducted over 2 to 5 days, and examining committee members may ask closed-book (no reference materials available) or open-book questions. Typically, each committee is assigned one of the Core Topic Areas and gives you a single day (i.e., 4-8 hours) to answer a set of questions on that topic area. Your major professor is responsible for assuring the exam gives reasonable weight to each of the subject areas and that the exam is given under conditions conducive to good work.
- Importantly, you are not expected to pass a single general exam given to all candidates. Instead, a unique exam will be prepared for you taking into account your dissertation area and your specific academic coursework and background. However, the exam will be “general” in the sense that all students will be examined on the same core topic areas (see “Core Area Requirements”). More specific detailing and identification of the background and knowledge expected of each candidate will be the responsibility of the examining committee. Committee members will work with you to mutually agree on the specific subject areas to be examined within the general Core Topic Areas. They will also give you some indication of the level of competence they expect.
- Each subject area of the written exam will be graded pass/fail by the examiner who wrote the questions. Questions not graded within 10 days after the exam will be assumed passed. All areas must be passed to pass the exam.
- *Consequences of failure.*--If you fail any one of the Core Topic Areas, then you have failed the exam; the consequences will depend on the nature and extent of the failure. If all three Core Topic Areas are failed, you will lose your status as a PhD student in the NRC program at the end of the current semester. If you fail one or two of the Core Topic Areas, a second, final exam is permissible by mutual consent of you and your committee. The second exam will be only in the areas failed and must take place within six months of the date of the first exam. If you fail any of the topic areas during the second exam, then you have failed the

exam and you will lose your status as a PhD student in the NRC program at the end of the current semester.

### *Oral Exam*

- The main purpose of the oral exam is two-fold. First, and most importantly, the oral exam serves as a follow-up to the written exam (i.e., it provides committee members an opportunity to probe areas revealed as weaknesses, but not failures, in the written exam). Secondly, it provides an opportunity for committee members to examine you on additional topic areas not covered in the written exam.
- Your oral exam will be scheduled within four weeks after passing the written exam. At least *one week* prior to the oral exam, have your major professor announce the exam to the graduate faculty (PHD\_comps\_notice.doc).
- The oral exam is to be a closed exam. Faculty not on the examining/advisory committee may request, at least *two days* before the exam, permission from your major professor to attend. You have a right to know, however, who is expected at your exam. A moderator may be selected by the Department Head, GCC or GPD from among the Department's Graduate Faculty at your or your major professor's request. The Department Head, GCC and GPD are welcome to attend without notice.
- Your major professor (or the Moderator) will chair the exam. The exam will normally take three to (no more than) four hours. The Chair will first outline the procedures and introduce all people present, if necessary. There will then be two or more rounds of questions with each voting examiner given up to 20 minutes per round, or more if agreed upon by the committee. One examiner may yield the floor to another. At your request, a break may be taken between the rounds of questioning.
- When the questioning is completed, you will be asked to leave. Non-voting faculty may address comments to the examining committee. Then all non-voting faculty except for the Moderator (if present) will be asked to leave.
- The voting will proceed by secret, written ballot: PASS or FAIL. Only officially-appointed examiners will vote, the Moderator (if present) will not. After a brief discussion, a trial vote will be taken. If the votes are unanimously PASS, no further discussion is needed and you will be immediately notified of the results. If there are FAIL votes, there will be further discussion regarding the extent and seriousness of the weakness. There will then be a final ballot. If there are still FAIL votes, you will have failed the exam and you will be immediately notified of the results. If you fail the exam, the committee has the responsibility to tell you, either verbally at the time of the exam or in writing within one week, of the reasons why you failed.
- *Consequences of failure.*--If you fail the exam, at the discretion of your examining committee, you may be given the opportunity for a second, final oral exam, which will be conducted as the first. However, the examining committee is not obligated to offer you a second oral exam if they feel the deficiencies are too great. However, in most circumstances you will be given guidance as to any deficiencies and specific direction regarding remediation measures. Remediation may entail additional coursework and/or independent study. If a second, final oral exam is given, it must take place within six months after the first exam. If you fail the final exam (whether it be the first or second exam given), then you will lose your status as a candidate for a PhD

- After the final exam (first or second), your major professor will ask the GCC to send the results (PASS or FAIL) to the Graduate School (comps\_outcome.doc).

### 3.6 Practicum (MS Professional Degree only)

You must sign up for a practicum as part of your professional degree. The practicum includes a 6-credit project designed by the student and major advisor and reviewed and approved by the committee. The practicum must lead to a (preferably publishable) professional paper (e.g., internship evaluation, short research project, literature review, etc.) and can be based either on (1) a 12-week professional internship in a government agency, non-government organization, or private company (e.g., consulting firm) pertinent to the curriculum, or (2) if the student already has such experience, a 6-credit project that pertains directly to such experience.

Upon completion of the practicum, you must prepare a professional paper, which you will later defend as part of the final defense. This paper will be reviewed by your committee. No practicum is completed (thus no grade assigned) until the committee grades (P/F) the professional paper. In addition, if the practicum involves an internship, the sponsor will complete an evaluation form focusing upon your meeting the specific objectives agreed to in the original proposal "contract", and forward the evaluation to the faculty advisor. In addition, you will complete an evaluation form focusing upon the value of the experience, and the manner in which the sponsor met the objectives of the contract. Your committee will review these evaluations when members grade (P/F) the Practicum (after completion of the professional paper). A poor evaluation from the sponsor will not mandate that the student receive an "F" for the practicum credits; it will serve as an indication of the success of the internship experience in the eyes of the sponsor.

### 3.7 Thesis/Dissertation/Practicum Proposal

#### 3.7.1 MS Thesis and PhD Degrees

You must submit a thesis/dissertation proposal (also called prospectus) describing fully the work to be done. This proposal must be approved and signed by all members of the Committee, the GPD, and the Department Head and forwarded to the Graduate Dean at least four months before the thesis defense or seven months before the dissertation defense. A specific format is given for the title page (see Graduate Student Handbook online), but there is not a specific format for the text. For PhD students, the proposal must be submitted after passing the comprehensive examination (see above). The format of the proposal is to be determined by you and your examination/advisory committee; however, ideally it should be written in an appropriate publication format but with the "Results" and "Discussion" sections replaced with "Anticipated Results." Your experimental plan, plans for data analysis, a time line, and your publication plans should also be included. The Research Concepts course will provide you with the background for developing a proposal.

#### 3.7.2 MS Professional Degree

Prior to starting the practicum, you must prepare a practicum proposal describing: 1) the work to be conducted, 2) your responsibility while on that assignment, 3) the responsibility of the

sponsoring agency in your training, if an internship, and 4) the nature of the professional paper that will serve as the major basis for assigning a P or F grade to the practicum. This proposal must be signed by you, the sponsor (if an internship), and all committee members prior to start of the practicum.

### 3.8 Thesis/Dissertation/Professional Paper Defense

The final defense is really much more than just a rehash of your thesis/dissertation/professional paper. The defense is intended to determine if you see the larger picture within which your work fits and determine whether you can adequately defend your work under careful scrutiny. Note, the entirety of the defense is fully open to any interested persons, including other students, faculty and the general public, but see rules of participation below.

#### 3.8.1 Before the Defense

- You must have prepared and submitted a thesis/dissertation/practicum proposal (see “Thesis/Dissertation/Practicum Proposal”) describing fully the work to be done. For MS Thesis and PhD degree students, this proposal must be approved and signed by *all* members of your Committee, the GPD, and the Department Head and forwarded to the Graduate Dean at least four months before the MS thesis defense or seven months before the PhD dissertation defense (proposal\_cover.doc and proposal\_memo.doc). For MS Professional degree students, your proposal must be signed by you, the sponsor (if an internship), and all committee members prior to the start of the practicum, but it does not require the signature of the GPD or Department Head and it does not have to be forwarded to the Graduate School.
- For PhD students, you or your major professor must send a copy of the defense announcement (defense\_announce.doc) to the Office of Degree Requirements via the GCC at least four weeks before the defense. That office will forward the announcement to staff at the Campus Chronicle.
- You must obtain tentative approval of the thesis/dissertation/professional paper as to subject matter and syntax by all members of the Committee before the defense can be scheduled. Specifically, at least one week before the thesis/professional paper defense is scheduled or four weeks before the dissertation defense is scheduled, all committee members must email the Committee Chair (typically your major advisor) confirming that they have read the thesis and approve you as ready for the defense. After hearing from all committee members it is up to the Chair to determine that you are ready to defend and with you coordinate the scheduling of a defense date. Note, the thesis/dissertation/professional paper need not be in its final version for tentative approval; the Committee may require amendments following the defense.
- You must put a copy of the tentatively approved thesis/dissertation/professional paper in the department office at least five working days before the defense.
- Your major professor must distribute an announcement of the defense to all faculty and graduate students in the program at least one week before the defense (defense\_notice.doc). The announcement will include your name, thesis/dissertation/professional paper title, the place and time of the defense, names of the examining committee members (and the Moderator, if there is one), and a list of your graduate courses. Defenses should be scheduled only when the University is open and not on holidays or religious holy days.

- The entirety of the defense, including the seminar presentation, Q&A involving non-committee members, and examination by the committee, is by default open to any interested persons, including other students, faculty and the general public. However, you and your major professor may petition the GCC or GPD (if the GCC is a committee member) to have the committee examination portion of the defense closed to students and the public; however, faculty cannot be excluded from any portion of the defense. This petition must be received by the GCC or GPD, as appropriate, at least one week prior to the defense. If approved, the Committee Chair (or Moderator) will announce the closed exam during their review of the ground rules of the defense at the time of the defense (below).

### *3.8.2 Content of the Defense*

- The emphasis of the defense will be on your thesis/dissertation/professional paper and closely related subjects that require you to demonstrate an understanding of how your work fits into the broader context of environmental conservation.
- The Chair (or Moderator) will chair the defense. The recommended length is two to three hours but with a maximum of four hours. You or any member of the Committee may request the option of having a moderator, which may then be appointed either by the Department Head, GCC or GPD. You may appeal to the Department Executive Committee for a variance of rules either before or following the defense.
- The Chair (or Moderator) will review the ground rules of the defense and introduce you and the committee members.
- You will summarize your research in a seminar presentation. You will be expected to do this in 30-45 minutes.
- The Chair will invite questions from the audience; the presentation and Q&A session are generally not expected to exceed 60 minutes in total. After questions, there will be a break and the candidate and committee members will reconvene to begin the formal examination. All other interested persons (faculty, students, public) are free to attend the examination but may not participate (i.e., they may not ask questions).
- You will be asked questions by each member of the committee (including Consultants) with each questioner given 20-40 minutes depending on the number of committee members and the time available. An examiner may yield the floor, with permission of the Chair, if another examiner wants to pursue a line of questioning to its logical conclusion or to resolve ambiguities. Note, non-committee members may be present during the examination, but they are not allowed to ask you questions. They may participate in the ensuing discussion if and only if the Chair (or Moderator) deems it appropriate and solicits their participation.
- After the examiners are through, you and all other students and non-invited guests will be asked to leave.
- Non-voting faculty and invited guests may address comments to the Committee. Non-voting faculty and guests, excepting the moderator and Consultants, will then be asked to leave prior to the voting.
- Voting: All voting will be by secret, written ballot for PASS or FAIL. Only officially-appointed examiners vote, the Moderator and/or Consultants do not vote. After brief discussion, a first ballot will be taken. If the votes are unanimously PASS, no further discussion is necessary and you will have passed the defense. If there are FAIL votes, there

will be further discussion regarding the extent and seriousness of your weakness. There will then be a final vote. *The vote must be unanimously PASS for you to pass the defense.*

- You will be informed verbally of the result as soon as it is reached. Note, you may pass the defense, but still be required to make changes in the thesis/dissertation before it is signed in its final form.

### 3.8.3 *After the defense*

- The Committee will inform you of any changes required in the thesis/dissertation/professional paper. *All committee members and the Department Head* (but not necessarily the Consultants) must sign your thesis/dissertation/professional paper in its final form (thesis\_approval.doc).
- The Chair will notify the Graduate Dean of the date and results of the defense by a memorandum to be co-signed by the GPD (defense\_outcome.doc).
- If you pass the defense, you must complete and sign the Degree Eligibility Form, obtain the required signatures, and deliver it to the Graduate School (Office of Degree Requirements) along with the required fees. For MS Thesis and PhD Degrees, you must also submit your thesis/dissertation and the accompanying signature page to the Graduate School and see that *bound* copies are provided for the Department (delivered to the Main Office) and your major professor. Make sure and check on the deadlines set by the Graduate School for delivering theses/dissertations and other materials. Note, thesis/dissertation can now be submitted electronically, so check with the Graduate School for the procedures on submitting electronically.
- *Consequences of failure.*—If you fail the defense, you may petition (in writing) the Executive Committee of the Department within two weeks of the Examination. If the Executive Committee finds that your Committee has committed one or more procedural errors, it may ask your Committee to reconsider. If there are serious personality conflicts involved, the Executive Committee may ask the GPD to petition the Graduate School for a new committee to be appointed which may conduct a new defense. Also, you may seek help from the Graduate School directly either by contacting the Assistant Dean or by contacting the Graduate Council. Be aware that they may refuse to hear your petition. Be aware also, that if things get to this point, it is most difficult to ever resolve the situation to everyone's mutual satisfaction. For example, it may prove impossible to find faculty willing to serve on a new committee. Also, you may find help and/or advice through the university's Ombuds Office. Finally, your Committee may decide to table a FAIL vote and conduct a second (last) defense after allowing you time to make changes in your thesis/dissertation/professional paper and presentation.

## 4. TIME TABLE, CHECKLISTS AND FORMS

### 4.1 Suggested Timetable

You bear the major responsibility for completing your degree in a timely manner. You may find that your major professor doesn't keep track of how long you have been enrolled in your program. This doesn't mean the following responsibilities are unimportant – it just means that you need to push your major professor to help you meet these scheduling goals. The timetable below is meant to be a guide to help you stay on track. However, there are many situations that may require modifications to this timetable. It is the responsibility of you and your major professor to modify the timetable accordingly in order to see that all degree requirements are met in a timely fashion.

#### *First semester*

- Work with your major professor to define your thesis/dissertation/practicum topic.
- Through discussions with your major professor, pick an examination/advising committee (see “Examination/Advising Committee”). Get their approval to be named to the committee. *Have your major professor complete the committee appointment memo (committee.doc) and forward to the GCC for GPD signature and submission to the Graduate School.*
- Prepare the list of courses you plan to take to ensure that you will meet the Core Area requirements (see “Core Area Requirements” below) and get your committee’s endorsement. Note, unlike MS students, PhD students do NOT have any specific course requirements. PhD students are nevertheless expected to demonstrate breadth and depth of understanding in each of the core topic areas in the comprehensive exam. It is up to the student and their committee to determine how best to achieve this goal, whether through additional course work or other means.
- For MS students, enroll in the following required courses:
  - NRC 601 (Research Concepts) – this course is designed for all incoming (Master’s level) graduate students and is taught every Fall semester. Among other things, in this course you will prepare your thesis proposal and receive critical feedback from your peers.
  - NRC 791S (Communicating Science–Speaking) – this course is a companion to Research Concepts and is taught every Fall semester. Among other things, in this course you will present your proposal to the department. The purpose of this presentation is to help you obtain critical, constructive comments on your research plan from your peers before it's too late to do anything about it.
  - NRC 697 (Design and Analysis of Ecological Data) – this course is a mandatory introduction to ecological statistics for NRC graduate students and is taught every Fall semester. This purpose of this course is to provide the necessary foundation for understanding and using statistics in environmental conservation research. Exemptions from this course are allowed if you can demonstrate comparable statistical training.
  - NRC 691A (Seminar Series in Natural Resources Conservation) – this is the departmental seminar, held every semester. You are required to enroll in seminar for one semester; however, you are strongly encouraged to enroll in this seminar every semester that you are on campus.

### *Prior to Final Semester*

- For MS students, enroll in NRC 791W (Communicating Science–Writing) – this course is taught every Spring semester. Among other things, in this course you will learn how to write scientific publications in addition to other forms of communicating your scientific findings.
- Complete all your Core Area requirements (see “Core Area Requirements” below). Remember, in the comprehensive examination you are expected to demonstrate to your committee competence in each of the core topic areas, so it behooves you to have completed all necessary coursework prior to your comprehensive exam.
- For MS students, complete your comprehensive examination (see “Comprehensive Exam”). Note, only after successfully completing the comprehensive exam will you be allowed to schedule your final thesis/professional paper defense. *After the exam, have your major professor complete the comprehensive exam memo (exam\_outcome.doc) and forward to the GCC (no correspondence need to be sent to the graduate school).*
- For PhD students, complete your comprehensive examination (see “Comprehensive Exam”). Note, only after successfully completing the comprehensive exam will you officially become a candidate for a PhD. *At least one week prior to the oral portion of the exam, have your major professor announce the exam to the graduate faculty and students (comps\_notice.doc). After the exam, have your major professor complete the comprehensive exam memo (comps\_outcome.doc) and forward to the GPD for signature and submission to the Graduate School.*
- Present your proposal to your committee. Work with your major advisor to set up a meeting with your committee for the presentation. The purpose of this presentation is to get approval from your committee to move forward with your research/practicum. Remember, these are the individuals who you must defend your thesis/dissertation/professional paper to at the end, so it is best to get their approval as to your research plan while you still have time to amend the plan. *After the Committee approves of the proposal and signs the approval form (proposal\_cover.doc), have your major professor complete the outline approval memo (proposal\_memo.doc) and forward this, along with the outline approval form (signed by all committee members, department head, and GPD) and two copies of the proposal, to the GCP for GPD signature and submission to the Graduate School (only thesis/dissertation proposals get submitted to the Graduate School).*

### *Final Semester*

- For MS Thesis and PhD students, complete your thesis/dissertation, carefully following the guidelines published by the Graduate School. Also, you can contact the Office of Information Technologies/Personal Computer Support Services (5-9730) which offers workshops to help users of common word processing packages deal with formatting tasks and details of thesis/dissertation preparation.
- Submit a draft of your thesis/dissertation/professional paper to your committee for tentative approval. Have each committee member email your major advisor indicating that they have reviewed a draft of your thesis and that they have approved the scheduling of your defense. For MS students, approvals from ALL committee members must be received by your major advisor at least one week prior to your scheduled defense. For PhD students, approvals from ALL committee members must be received by the GCC at least four weeks prior to your scheduled defense.

- For MS Thesis students, schedule your defense. Note, your defense must be at least four months after Graduate School approval of your thesis outline and one week after your major advisor has received approval from ALL committee members. *Have your major advisor notify all NRC faculty and students of your thesis defense via an email announcement at least one week prior to your defense (see *defense\_notice.doc*).*
- For PhD students, schedule your defense. Note, this involves two steps. *First, a copy of the defense announcement (see *defense\_announce.doc*) must be forwarded via the GCC at least four weeks before the defense to the Office of Degree Requirements. They will post the announcement online in the Weekly Bulletin. Second, at the same time, have your major advisor notify all NRC faculty and students of your defense via an email announcement (see *defense\_notice.doc*).* IMPORTANTLY, your defense must be at least seven months after Graduate School approval of your dissertation outline and at least four weeks after the GCC has received the defense announcement from the Committee Chair.
- For MS Professional students, schedule your defense. Note, your defense must be at least four months after approval of your practicum outline and one week after your major advisor has received approval from all committee members. *Have your major advisor notify all NRC faculty and students of your defense via an email announcement at least one week prior to your defense (see *defense\_notice.doc*).*
- Place a copy of your tentatively approved thesis/dissertation/professional paper in the department office at least five working days before the defense.
- Defend your thesis/dissertation/professional paper to your committee and to the Department (see “Thesis/Dissertation/Professional Paper Defense”). *After the defense, have your major advisor complete the defense outcome memo (*defense\_outcome.doc*) and forward to the GCC for GPD signature and submission to the Graduate School.*
- Revise your thesis/dissertation/professional paper and submit it to the Graduate School. Note, professional papers do not need to be submitted to Graduate School).
- Complete the degree eligibility form (obtained from NRC Department office) and forward to the Department Head and GCP for GPD signature and submission to the Graduate School.
- Finalize publication plans with your major advisor.
- Clean desk and research area, and return all campus keys.
- Leave forwarding address and telephone numbers at NRC Department office.

## 4.2 MS Thesis Degree Checklist

Item	Date Completed
Beginning Semester (season/year):	_____
Statute of limitations ( <i>3 years from admission</i> ):	_____
• First request for extension to SOL – Memo to Graduate School via GPD (SOL1.doc)	_____
• Second request for extension to SOL – Memo to Graduate School via GPD (SOL2.doc)	_____
Thesis topic area chosen:	_____
Committee members chosen:	
• Memo to Graduate School via GCC (committee.doc)	_____
List of courses chosen and okayed by Committee:	_____
Thesis proposal approved by Committee, Department Head, and GPD and submitted to Graduate School via GCC (must be at least <u>4 months</u> prior to thesis defense):	
• Proposal cover sheet (proposal_cover.doc)	_____
• Memo to Graduate School via GCC (proposal_memo.doc)	_____
Course work completed:	
• Research Concepts, NRC 601	_____
• Communicating Science—Speaking, NRC 791S	_____
• Design and Analysis of Ecological Data, NRC 697	_____
• Department seminar, NRC 691A (one semester)	_____
• Communicating Science—Writing, NRC 791W	_____
• All Core Area requirements completed	_____
Comprehensive Examination completed :	
• Memo to GCC (exam_outcome.doc)	_____
Thesis pre-approved by Committee (i.e., ready to defend; note, each committee member must email Chair at least <u>one week</u> prior to defense and indicate that the draft thesis has been reviewed and student is approved to defend):	_____
Thesis defense scheduled (at least <u>one week</u> prior to defense and <u>four months</u> after proposal outline received by Graduate School):	
• Notice to NRC Faculty and Students (defense_notice.doc)	_____
Thesis defense outcome (pass/fail):	

- Memo to Graduate School via GCC (defense\_outcome.doc) \_\_\_\_\_

Thesis revised, signed and submitted to Graduate School:

- Thesis signed by Committee & Department Head (thesis\_approval.doc) \_\_\_\_\_
- Final thesis submitted to Graduate School \_\_\_\_\_

Degree Eligibility Form (yellow) submitted to Graduate School via GCC  
and Department Head (also document completion of all activities listed above): \_\_\_\_\_

Publication plans finalized: \_\_\_\_\_

Desk and research areas cleaned; all keys returned: \_\_\_\_\_

Forwarding address and telephone numbers to office: \_\_\_\_\_

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### 4.3 PhD Degree Checklist

<u>Item</u>	<u>Date Completed</u>
Beginning Semester (season/year):	_____
Statute of limitations (4 years from admission, with MS):	_____
• First request for extension to SOL – Memo to Graduate School via GPD (SOL1.doc)	_____
• Second request for extension to SOL – Memo to Graduate School via GPD (SOL2.doc)	_____
Dissertation topic area chosen:	_____
Committee members chosen:	
• Memo to Graduate School via GCC (committee.doc)	_____
List of courses chosen and okayed by Committee:	_____
Comprehensive Examination announcement:	
• Memo to Graduate Faculty (comps_notice.doc)	_____
Comprehensive Examination completed :	
• Memo to Graduate School via GCC (comps_outcome.doc)	_____
Dissertation proposal approved by Committee, Department Head, and GPD and submitted to Graduate School via GCC (must be at least <u>seven months</u> prior to dissertation defense):	
• Proposal cover sheet (proposal_cover.doc)	_____
• Memo to Graduate School via GCC (proposal_memo.doc)	_____
Dissertation defense scheduled (at least <u>four weeks</u> prior to defense and <u>seven months</u> after proposal outline received by Graduate School):	
• Notice to Graduate School via GCC (defense_announce.doc)	_____
Dissertation pre-approved by Committee (i.e., ready to defend; note, each committee member must email Chair at least <u>four weeks</u> prior to defense and indicate that the draft dissertation has been reviewed and student is approved to defend):	_____
Dissertation defense notice to NRC faculty (at least <u>one week</u> prior to defense):	
• Notice to NRC Faculty and Students (defense_notice.doc)	_____
Dissertation defense outcome (pass/fail):	
• Memo to Graduate School via GCC (defense_outcome.doc)	_____

Dissertation revised, signed and submitted to Graduate School:

- Diss. signed by Comm. & Depart. Head (dissertation\_approval.doc) \_\_\_\_\_
- Final dissertation submitted to Graduate School \_\_\_\_\_

Degree Eligibility Form (yellow) submitted to Graduate School via GCC  
and Department Head (also document completion of all activities listed above): \_\_\_\_\_

Publication plans finalized: \_\_\_\_\_

Desk and research areas cleaned; all keys returned: \_\_\_\_\_

Forwarding address and telephone numbers to office: \_\_\_\_\_

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#### 4.4 MS Professional Degree Checklist

<u>Item</u>	<u>Date Completed</u>
Beginning Semester (season/year):	_____
Statute of limitations ( <i>3 years from admission</i> ):	_____
• First request for extension to SOL – Memo to Graduate School via GPD (SOL1.doc)	_____
• Second request for extension to SOL – Memo to Graduate School via GPD (SOL2.doc)	_____
Practicum experience chosen:	_____
Committee members chosen:	
• Memo to GPD (committee.doc)	_____
List of courses chosen and okayed by Committee:	_____
Practicum proposal approved by Committee and submitted to GCC (must be at least <u>four months</u> prior to defense):	
• Proposal cover sheet (proposal_approval.doc)	_____
Course work completed:	
• Research Concepts, NRC 601	_____
• Communicating Science—Speaking, NRC 791S	_____
• Design and Analysis of Ecological Data, NRC 697	_____
• Department seminar, NRC 691A (one semester)	_____
• Communicating Science—Writing, NRC 791W	_____
• All Core Area requirements completed	_____
Comprehensive Examination completed :	
• Memo to GCC (exam_outcome.doc)	_____
Professional paper pre-approved by Committee (i.e., ready to defend; note, each committee member must email Chair at least <u>one week</u> prior to defense and indicate that the draft paper has been reviewed and student is approved to defend):	_____
Professional paper defense scheduled (at least <u>one week</u> prior to defense and <u>four months</u> after proposal approved):	
• Notice to NRC Faculty and Students (defense_notice.doc)	_____
Defense outcome (pass/fail):	
• Memo to Graduate School via GCC (defense_outcome.doc)	_____

Professional paper revised, signed and submitted to GPD:

- Professional paper signed by Comm. & Depart. Head (thesis\_approval.doc) \_\_\_\_\_

Degree Eligibility Form (yellow) submitted to Graduate School via GCC  
and Department Head (also document completion of all activities listed above): \_\_\_\_\_

Publication plans finalized: \_\_\_\_\_

Desk and research areas cleaned; all keys returned: \_\_\_\_\_

Forwarding address and telephone numbers to office: \_\_\_\_\_

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## 4.5 Forms

Memos are needed for virtually everything that is submitted to the GPD (via your GCC) and the Graduate School, as indicated in the checklist above. Anything that is submitted to the GPD (via your GCC) and Graduate School should be a memo written in a letter of correspondence format. The standard required memos are described below and a template has been provided. However, there may be times a standard memo does not exist to meet your need. When in doubt, check with Linda Fortin in the main office of Holdsworth Hall, and if that doesn't work, call the Graduate School and ask what they specifically want on the submitted "form". Often times these forms do not exist and must be customized to the occasion. Finally, when your signature is required, it is recommended that you sign all forms in black ink.

The following forms or templates for various memos that may be needed are available (download from Department website) to facilitate communication between the NRC Graduate Program and the UMass Graduate School. It is you and your major professor's responsibility to fill out the appropriate form and forward it to the GCC in a timely manner when communication with the Graduate School is required. The GCC will forward the approved memo to the GPD for signature and submission to the Graduate School. Note, these forms are templates only; you will need to fill in the necessary personal information (shown in italics).

- Committee.doc – memo to Graduate School naming committee membership
- Exam\_outcome.doc—memo to GCC reporting on outcome of comprehensive exam
- Comps\_notice.doc – memo to NRC announcing preliminary oral exam for PhD student
- Comps\_outcome.doc – memo to Graduate School on outcome of preliminary exam
- Defense\_announce.doc – memo to Graduate School announcing PhD defense
- Defense\_notice.doc – memo to NRC announcing defense
- Defense\_outcome.doc – memo to Graduate School on outcome of defense
- Full-time-status.doc – memo to Graduate School declaring student full-time status
- Proposal\_cover.doc – signature page for proposal
- Proposal\_memo.doc – memo to Graduate School accompanying proposal
- SOL1.doc – memo to Graduate School declaring first statute-of-limitations extension
- SOL2.doc – memo to Graduate School requesting second statute-of-limitation extension
- Thesis\_approval.doc – signature page for final thesis/dissertation/professional paper

Appendix A. List of Natural Resources Conservation (NRC) course offerings in each of the core topic areas. Note, the list of course offerings and when they will be offered is subject to constant change, so check with the schedule posted on the departmental website. Also note that courses offered by other departments can fulfill the core area requirements, subject to approval by the GCC.

***Core Topic Area 1: Environmental Conservation (biology, ecology, conservation and environmental building design)***

Wildlife Habitat Management	NRC 564	4	Fuller
Wildlife Population Dynamics & Management	NRC 565	4	Griffin
Fisheries Science and Management	NRC 571	4	Juanes
Watershed Science and Management	NRC 597R	3	Randhir
Ecology of fish	NRC 597K&J	4	Juanes
Landscape Ecology	NRC 621	4	McGarigal
Conservation Biology	NRC 697A	3	Griffin
Urban Ecology	NRC 697U&V	4	Warren
Carnivore Conservation	NRC 697C	3	Fuller
Predator-prey interactions	NRC 697T	3	Juanes
Conservation Genetics	NRC 697	4	Whiteley
Ecological Interactions of Fishes	NRC 720	3	Mather
Advanced Fisheries Management	NRC 757	3	Juanes
Wetlands Ecology & Conservation	NRC 768	3	Griffin
Endangered Species Management	NRC 597E	2	Smith
Wetlands Assessment and Field Techniques	NRC 597W	2	Jackson/Griffin
Watershed Management (Online)	NRC 597O	3	Randhir
Advanced Watershed Management	NRC 697R	3	Randhir
Diadromous Fisheries Ecology and Conservation	NRC 697G	3	Haro
Readings in Conservation Biology	NRC 697AA	1	Warren
Forest Stand Dynamics	FOREST 604	3	Kelty
Forest Resource Management	FOREST 540	4	Barten
Silviculture	FOREST 526	4	Kelty
Forest and Wetland Hydrology	FOREST 528	3	Barten
Land Use and Watershed Management	FOREST 697Q	3	Barten
Timber Harvesting	FOREST 521	3	Kittredge
Sustainable Building and LEED Certification	BCT 597D	3	Adjunct
Building Energy and Environmental Systems	BCT 597E	3	Hoque

***Core Topic Area 2: Quantitative and Physical Sciences***

Ecosystem Modeling & Simulation	NRC/NRC 577	3	Randhir
Digital Remote Sensing	NRC 587	3	Finn
Intermediate Biostatistics for Natural Resources	NRC 697S	4	Sievert

Advanced Biostatistics for Natural Resources	NRC 697?	4	Finn
Design and Analysis of Ecological Data (Lab)	NRC 697S	2	McGarigal
Multivariate Statistics for Natural Resources	NRC 631	4	McGarigal
GIS for Natural Resource Management	NRC 592	3	Schweik
GIS for Natural Resource Management	NRC 592	3	Finn
Advanced Topics in GIS	NRC 697G	3	Finn
Advanced Systems Ecology	NRC 777	3	Finn
Interpretation of Ecological Data	NRC 697I	3	Mather
Infor. Tech. in the Public and Nonprofit Sectors	PPA 631	3	Schweik
Forest Measurements	FOREST 534	4	Kelty
Natural Resource Inventory of Local Lands	NRC 597I	3	Kittredge
Mechanics of Materials	BCT 530	3	Clouston
Design of Timber Structures	BCT 540	3	Clouston
Building Energy Performance Analysis	BCT 597B	3	Hoque

***Core Topic Area 3: Human Dimension, Policy, Economics***

Human Dimensions of Resource Management	NRC 597T	2	Loomis
Human Dimensions of Natural Resource Conservation	NRC 697E	3	Muth
Natural Resources Policy and Administration	NRC 697P	3	Muth
Social Conflict and Natural Resource Policy	NRC 697D	3	Muth
Ecological Economics and Sustainability	NRC 697Z	3	Randhir
Water Resources Management and Policy	NRC 697W	3	Randhir
Case Studies in Land Conservation	NRC 597C	3	Kittredge
Forests and People	FOREST 225 [596]	3	Barten
Building a Formalized Plan for Green Market Positioning	BCT 597S	3	Adjunct

Appendix B. List of Natural Resources Conservation (NRC) faculty (regular faculty plus adjuncts) and their primary (and secondary in many cases) affiliation with the areas of concentration. Note, the concentration affiliation is used for the purpose of meeting MS examination/advisory committee requirements, since one member of the MS committee must be an “outside” member having a primary concentration affiliation different from your own.

Faculty (on-campus and Conte)	Concentrations				
	Wildlife, Fish & Conservation Biology	Forest Resources & Arboriculture	Water, Wetlands & Watersheds	Environ. Policy & Human Dimensions	Building Systems
Barten		S	P		
Bloniarz		P			S
Bradley	P		S		
Brooks	P		S		
Butler		P		S	
Clouston		S			P
Damery		S			P
Danylchuck	P		S		
DeStefano	P			S	
Finn	P		S		
Fisette		S			P
Fuller	P				
Griffin	P		S		
Haro	P		S		
Hoque		S			P
Juanes	P				
Kane		P			S
Kelty		P	S		
King	P				
Kittredge		P		S	
Lanza			P	S	
Letcher	P				
Loomis				P	
Mather	P				
McCormick	P				
McGarigal	P				
Muth				P	
Nicolson			S	P	
Nislow	P				
Patterson		P			
Randhir			P	S	
Ryan		P			
Schweik				P	
Schreyer		S			P
Sievert	P				
Warren	P			S	
Whiteley	P				

Appendix C. Academic requirements associated with the various degree concentrations are attached.

This appendix is to be completed at a later date.