The Master of Forest Resources (Forest Management)
School of Forest Resources, University of Washington

Program Description

The MFR (Forest Management) program is designed to be completed in one calendar year. It is a non-thesis program with emphasis on course work to develop the technical and managerial skills required of today's professionals and a capstone experience to reinforce and apply the material learned in the earlier courses. The program is structured into four broad categories (Figure 1):

- Common, required coursework — 7 credits (minimum)
- In-depth topical areas distributed among the four topic areas required for SAF accreditation — 24 credits
  Forest Biology/Ecology
  Forest Management
  Forest Measurements
  Forest Policy/Administration
- General education, unrestricted graduate electives — 9 credits
- Capstone - Independent Study or Graduate Internship
  Students will work to develop a natural resources project with an outside client such as a landowner. — 5 credits

45 credits (minimum)

All entering students are required to take the graduate orientation seminar (CFR 500), Natural Resource Issues (CFR 509), and Advanced Silviculture (CFR 526) for a total of seven credits. If students have not had Principles of Silviculture (ESRM 428) or an equivalent course prior to starting the MFR, they must take this class for a total of twelve credits.

Students will choose relevant course work with the approval and under the supervision of a designated faculty advisor. Each topic area will have a list of courses that have been approved by the faculty (Appendix A).

In addition, students take 9 unrestricted credits to add depth and breadth to their education.

To round out their educational experience, the students conduct a capstone project (5 credits) where they bring their skills to bear on a real-life project in collaboration with an outside client. Where appropriate, they act as an interdisciplinary team. This capstone course is seen as the crowning experience, preparing them for real-life situations they will encounter after graduation. Example capstone projects are given in Appendix B.

Admission Criteria

Students interested in the Master of Forest Resources (Forest Management) degree may come from different academic backgrounds. Students who have an adequate background in natural or forest resources can proceed directly into the program. Undergraduate students at the School of Forest Resources enrolled in the Environmental Sciences and Natural Resource Management

(ESRM) curriculum are advised to follow the Sustainable Forest Management (SFM) pathway if they wish to apply to the program. Students without the requisite background would take additional course work as described in the SFM undergraduate emphasis area.

The usual criteria for admission into the Graduate School (GRE, GPA >3.0) are applied. In addition, applicants are expected to have a substantial natural resources background. A group of three faculty reviews each application. In addition to basic admissibility criteria, they assess the applicant's natural resources background and the appropriate path through the program. The applicant is then denied admission, admitted with a requirement that deficiencies will be addressed, or admitted without reservation.

Administration

Faculty Roles

Professor E. David Ford is the Master of Forest Resources (Forest Management) Program Coordinator. He is responsible for recruiting students, coordinating admissions, and maintaining the MFR (Forest Management) curriculum with assistance from the SFR Curriculum Committee. An Admissions Committee consisting of three faculty members associated with the Program recommend admission and remedial coursework if required. Students in the Program may be advised by any faculty member associated with the MFR (Forest Management) Program and should seek those individuals who expertise best align with their interests. The faculty advisor approves the coursework list selected by the student from the directed and unrestricted electives. Core faculty currently include: Professors Bradley, Briggs, Ford, Greulich, Schiess, and Associate Professor Turnblom. Because expertise in forest management is centered in the School of Forest Resources, it is not expected that faculty from other departments serve as faculty advisors on student committees.

Appendix A. Directed Elective Course Lists

At least two classes must include field skill development per SAF accreditation requirements. The student and faculty advisor selects the relevant coursework from the lists below. The selection must be consistent with requirements of the Graduate School. The program requires 45 credits rather than the 36 credits of the Graduate School, but 18 must be 500-level or above. No 300-level courses are included in the list of courses, and none would be acceptable. There is student-advisor choice within that framework to select the most relevant coursework.

Forest Biology/Ecology (at least two classes)

- ESRM 410 (5) Forest Soils and Site Productivity[1]
- ESRM 450 (5) Wildlife Ecology and Conservation
- ESRM 478 (5) Plant Eco-Physiology
- CFR 501 (5) Forest Ecosystems – Community Ecology[1]
- CFR 507 (4) Soils and Land Use Problems
- CFR 514 (4) Advanced Forest Soil Fertility and Chemistry
- CFR 535 (3) Fire Ecology
- CFR 547 (5) Stream and River Ecology

Forest Management (at least two classes)

- ESRM 461 (4) Forest Management and Economics 2
- ESRM 425 (5) Ecosystem Management
- CFR 528 (3) International Forestry
- CFR 545 (5) Forest Entomology/Laboratory
- ESRM 426 (4) Wildland Hydrology[1]
- ESRM 422 (3) Marketing of Forest Products
- ESRM 423 (3) International Marketing of Forest Products
- CFR 519 (3) Conducting and Publishing an Industry Performance Review
- CFR 590 Graduate Studies (Section: Marketing and Management from a Forest Products Perspective)

Forest Measurements (at least two classes)

- ESRM 430 (3) Aerial Photos and Remote Sensing in Natural Resources[1]
- CFR 564 (3/5) Advanced Forest Biometry[1]
- QSci 477 (5) Quantitative Wildlife Assessment
- QSci 482 (5) Statistical Inference in Applied Research
- QSci 483 (5) Statistical Inference in Applied Research
- QSci 486 (3) Experimental Design
- QERM 550 (5) Ecological Modeling and Spatial Analysis
- CFR 590 Graduate Studies (Section: GIS)

[1] Includes Field Skills

Forest Policy/Administration (at least two classes)

- ESRM 400 (5) Natural Resource Conflict Management
- ESRM 470 (5) Natural Resources Policy and Planning
- ESRM 465 (3) Economics of Conservation
- ESRM 460 (5) Institutionalizing Sustainable Ecological Practices
- CFR 571 (5) Resource Policy and Administration
- CFR 570 (3) Seminar in Environmental Sociology

Appendix B. Examples of MFR Capstone Projects

MFR capstone projects cover a broad range of topics with the consistent theme of professional application rather than research. Examples of the types of projects fitting under this umbrella include:

MFR Project: Creating Firesafe Forests in the Eastern Cascades

The dry forests of the eastern Cascades historically burned frequently and fire acted as an agent of ecosystem stability. Selection harvest of large trees, grazing, and fire exclusion substantially changed the character of these forests, and these forests are now prone to severe fire. The MFR project dealing with these issues would develop feasible silvicultural prescriptions that would be demonstrated to reduce fire hazard while meeting other resource objectives, including ecological and economic issues. Future growth and fire conditions within stands could also be forecast using state-of-the-art tools that link forest growth to fire hazard and behavior. The project would also demonstrate the appropriate interpretations and limitations of these tools, recognizing and addressing uncertainty.

MFR Project: Economic and Environmental Tradeoffs with Wildlife from Timber Management

Public concern for sensitive species protection requires that forests be managed to meet habitat needs to ensure species viability. However, on private forest lands recent trends have shown that when regulatory costs are too high, lands are converted to more profitable commercial and residential uses. The lands most vulnerable to conversion are predictably at the urban interface and may provide important habitat and other social values. The challenge for policy-makers is to adequately protect species while allowing commercial forestry to remain profitable. Science and technology can help. Students use real data with habitat indices tied to forest modeling and spatial analysis capabilities to assess the outcomes expected from simulated forest management alternatives to better understand the marginal economic and environmental trade-offs. Strategies to distribute changes in forest structure through time at different locations across the landscape towards minimizing unwanted impacts are discussed.

MFR Project: Energy Cogeneration as a Solution to Fossil Fuel Consumption

Forest fires, slash burns, and incineration of manufacturing wastes result in release of carbon to the atmosphere with implications for contribution to climate change. Fossil fuels (oil, natural gas, and coal) provide for most of the energy consumed by Washington citizens yet are considered the main cause of climate change. National and state policies have placed high priority on increased use of renewable fuels to reduce reliance upon fossil fuels towards lowering carbon emissions. Woody biomass can be used to generate clean electricity with very low carbon emissions. Students use forestry modeling and spatial analysis software with current forest inventory data and records of past harvest and process activities to estimate the potential volume of sustainable woody biomass available to potential cogeneration sites within a 50 mile haul distance constraint. Students estimate costs of producing electricity from wood as compared to fossil fuels and discuss implications for energy policy.

MFR Project: Fish-Forest Interactions and Appropriate Timber Management Strategies at the Watershed Level to Enhance Riparian Habitat Conditions

Timber is harvested to produce economic returns from forest lands, but it also impacts the environment. Forestry operations are often viewed as a tradeoff between economic benefits and environmental impacts, in which any additional environmental protection is seen as reducing economic returns. In exploring the economic and environmental costs of forest harvest and roading however, it is common to find that options for improving the economics can often improve the environmental impacts as well. An understanding of the operational considerations of logging and roading and their interaction with streams and riparian zones is the first step for identifying options for improving economic and environmental returns from the forest. Working with a landowner, students develop a watershed resource and transportation strategy for a forested area with extensive exposure to computer technology, environmental assessment methods, and forest operation design tools.

MFR Project: Designing and Analyzing a Monitoring Program

The design, application, and analysis of a Continuous Forest Resource Inventory (CFRI) system, or monitoring program, is a central idea in assessing and evaluating sustainable forestry practices. Typically, designing a monitoring scheme involves developing answers to the non-trivial questions of what to measure, how often, where sample areas should be located, and what fraction of the population should be sampled. Certainly, inventory objectives drive the answers to these questions, but require balancing the precision and accuracy requirements between all natural resources found on a project parcel for which the multi-resource, multi-objective monitoring program is desired. If prior measurements from an existing program are available, emphasis would be placed on calibrating a regional forest growth and yield model to local conditions for the purposes of removing some of the typical limitations inherent to forest stand dynamics forecasting tools.