

ECOLOGICAL MONITORING (NR457/657 - 3 credits)

Instructor: Dr. Demchik (CNR 246; mdemchik@uwsp.edu): TBA; open door policy

Course description: Theory and practice of ecological monitoring emphasizing ecosystem structure, functions, and populations

Rationale: Ecosystem restoration and adaptive management require monitoring to assess the condition and/or trends in ecological structure, processes and/or populations. Much of this monitoring has been legally mandatory in recent years. This course provides an interdisciplinary introduction to monitoring theory and techniques that are applicable to conservation biology and ecosystem management.

Learning Outcomes: The student will:

1. Write monitoring goals
2. Select indicator species
3. Develop monitoring plans
4. Collect monitoring data
5. Analyze monitoring data (both existing and collected)
6. Report results
7. Critique other monitoring plans

Course Design: Welcome to a completely redesigned NRES 457 class. This class has three components:

- Asynchronous online lectures (these are watched on your own time)...They will be weekly, if you do not watch them BEFORE the Tuesday activity, it will create issues. Please keep up.
- A synchronous in-person class (Tuesday 10:00-10:50) that will be used for discussion, planning and other activities
- A three-hour lab that is composed of the Friday lecture time and then the Friday lab time. This will be in the field often (i.e. outside in the cold). Please make sure to have appropriate clothing for this. We will be in the field on Friday much of the day, dress for it, this is a cold state.

Our Laboratory: I am in the middle of a number of restoration projects on both public and private lands. Most of you in this class already know me, so, you know that this is one of my favorite activities to do, both for the university and in my free time. Said another way, the majority of my waking hours focus on forestry and restoration activities. I am going to try to get you all addicted to this kind of work, so, you get to help fix a property for this class. See specifics below.

The Overall Story for the NRES 457, NRES 459 and For 434 Sec 3 Class

I thought that I would put this note in all three of these classes. These three classes are being designed to work together. This is the first year for that, so, I do not expect for it to play out perfectly this year.

For this year, we are going to be doing restoration work on the Burdette and Sarah Eagon Nature Education Preserve. This is owned by the UWSP Foundation and I am the property manager for all CNR properties.

This property is located along Flume Creek in Alban Township. Flume Creek is a Class 1 trout stream and is the channel is being restored by the WDNR (partially done and will be completed in 2022).

This property has quite an amazing history. The history of this site includes:

- A sawmill that ran in the late 1800's with a boarding house
- In 1893-1903, the Alban Post Office was located there

Maintaining the remnants of this history (the remains of the dam and foundations for the structures in an important element of this restoration plan.

In addition to the above, I have some funding from the Ruffed Grouse Society to develop this site as a Woodcock Habitat Demonstration Area. This funding is purchasing a brushsaw, some fuel, some trees and seeds and signage. I am hoping that this unit will be included as part of a large neotropical migratory bird demonstration project that I am hoping to get funded at a statewide level.

- The NRES 457 class will be doing the overall monitoring plan for this property.
- The NRES 459 class will be doing the restoration plan for this property.
- All three classes will be doing the restoration for the property.

Some Constraints for This Property

The work in the area around the stream needs to be completed, legally, prior to March 15th to protect an NHI species. I will not say anything broader than that, but, the work we are doing will be beneficial or neutral (depending on the activity) for this species; however, to avoid incidental take, we will have to be done before one of two things happens (either March 15th or whenever the remaining snow cover melts, whichever is later). For this reason, much of the tree cutting and brush cutting in the riparian area will happen prior to the due date for the plan. Please recognize that, while the timing is not ideal, this is in service to a Rare, Threatened or Endangered species, so, that is what we are going to do. The work in the uplands can continue until the end of the semester.

Site Goals

- Maintain the cultural remnants of cultural history for this site
- Favor woodcock and ruffed grouse habitat elements
- Favor early successional neotropical migrant birds
- Favor or remain neutral to amphibians
- Either favor or remain neutral for trout with all activities
- Increase structural diversity
- Develop a primitive camping site for use by Central Wisconsin Environmental Station
- Reduce both invasive woody plants and poison ivy
- Develop a trail to the standards of USFS Class 2 <https://www.fs.usda.gov/managing-land/trails/trail-management-tools/trail-fundamentals>

Birds

The following birds are of special interest on this site:

- Riparian
 - Woodcock
 - Yellow warbler
 - American Redstart
 - Veery
- Upland
 - Common yellowthroat
 - Eastern wood-peewee
 - Towhee
 - Rose breasted grosbeak

Frogs

The following are the main frogs that can be heard in spring that are likely to be present in the area:

- Boreal Chorus Frog
- Spring Peeper
- Wood frog

Full Blown Monitoring Plan: The main deliverable for this class is a full-blown monitoring plan. This is not one of those “pretend” plans, this is the plan that will become the monitoring plan for this property. This is assuming a 10-year monitoring window. After 10 years, the plan will be rewritten. This plan will be presented towards the end of the semester in a public zoom meeting that will include:

- WDNR Fisheries (who has been and will continue to do stream channel restoration work)
- Director of the Ruffed Grouse Society (who funded some of the work)
- Director of Central Wisconsin Environmental Station
- Members of the UWSP Foundation Board
- Several administrators for the campus (likely, the Dean, Associate Dean and maybe main campus administration)
- Local politicians
- Any interested university member (for previous plans, we have had over 50 attendees)

Regarding the overall plan, I recommend keeping this as a portfolio item, because, you ARE on the team for this plan. You will track all of your time assigned to any feature of this project (time budgeting and managing billable versus non-billable hours is one of the most important skills a person can learn in restoration work). Most of these monitoring plans are done in teams, because very few people (read that NO ONE) has all of the skills needed to do a good job on these for everything that needs to be assessed. We will divide up into teams during the first lab period. These are CONTENT SPECIALIST teams, so, you are going with your skillset, in part. You are allowed to have assistance from people outside of the class; however, this needs to be documented in the plan. Remember, NOTHING in this is done seat-of-the-pants, everything is DOCUMENTED in the plan.

Teams will include:

- Project coordination team- 2 people- These two people need to be in BOTH NRES 459 and 457
 - The goal of this group is to set initial timelines for each group and to assure they have met their timelines. This group will develop a spreadsheet of specific deliverables that will be included in the plan and will coordinate the development of the plan. This is an incredibly important job and the people who choose this team need to be some of the most self-motivated and aggressive people in the class. This team will draw all final sections together into a plan. Suggestion: come up with a template for what people should turn in to you. It should include everything from fonts to margins to headings. This makes life a lot easier (i.e. I have done this repeatedly, and hate dealing with problems created by poor formatting or people that “cannot” live within the rules of the format. They make life hard. Your group will meet with me every 3 weeks to do a progress report on the other groups’ work and yes, each of these meetings will be documented in the plan, as well.
- Monitoring Liaison with NRES 457 class-1 person
 - Focus- Making sure both documents interface. This person has to be in BOTH NRES 459 and 457. Their goal is to make sure that both the Monitoring and Restoration Plans work together. This is likely the single hardest job.
 - The direct contacts for this person are the Project Coordination Team for the Monitoring Class and the Restoration Class and you will interface extensively with the Implementation Liaison. This person has to be a very organized person who can “see the big picture”.
- Implementation Liaison with For 434 Sec 3- 1 person

- Focus- This student needs to be in the For 434 Sec 3 class. Making sure that the work done on the site during the weekend For 434 Sec 3 class match with the desired goals for both the Monitoring and Restoration Plan.
 - You will need to attend most/all of the site activities that are being hosted on the Eagon property for the For 434 Sec 3 class.
 - The direct contacts for this person are the Project Coordination Team for the Monitoring Class and the Restoration Class and you will interface extensively with the Implementation Liaison.
- Wildlife team- 5 people
 - This team will have to complete the online IACUC (Institutional Animal Care and Use Committee) online training and all protocols will need to be submitted to the IACUC committee for review. This will need to be completed in the first three weeks of semester. If you procrastinate, you cannot be on this team. I am serious about that, this one is fun, but, it is very intense. The goal of this team is to develop monitoring protocols that can be carried out by future classes/groups/volunteers. Any protocols that you use should be as standard as is possible. Remember that the internet and the library website exist. Use them. You are required to set up protocol sheets that can be followed by college students and volunteers. Any initial data can be collected by you but some is not possible. That is fine. You need to develop protocols for a 4 animals/elements; however, you can do more. You have to do the following animals:
 - Woodcock (this has to be observational ONLY)
 - Neotropical migrant birds (this has to be observational ONLY) See specific list above
 - Frogs (this has to be observational ONLY) See specific list above
- Plant Communities team- 4 people
 - You are responsible for developing a protocol that will inventory the following items:
 - Site condition (result in an overall map)...effort to document forest structure, regeneration, health and other factors
 - Spring ephemerals
 - Overall list of known plant species
 - Remember, you will need to develop protocols for monitoring this that can be followed by students or volunteers. Don't consider everything, focus on plants that are structural and food sources.
- Historic/Cultural Team- 3 people
 - You are focused on documenting mill history, location of potential trails/campsites and environmental ed curriculum. Your team is, in large part, collecting information from historical sources and mapping/photographing elements on the ground
 - There will be interface with Central Wisconsin Environmental Station regarding use of this information for educational interpretation
- Geospatial team- 2 people
 - The goal of your team is to create a geodatabase that collects all of the information from the previous teams. Everything for this needs to be stored in a format that will be usable for 10 years. This needs to be stored CLEANLY AND EFFICIENTLY. No creation of morphed, scary things. This is a database that can be used by others in the future. You will need to make things like:
 - Cover maps
 - Maps of monitoring plots
 - PDF's or Collector App projects for each group

Group Field Lab: Each of your groups will develop and deliver one of the field labs for this class. The students in the class will collect your data using your protocol sheets. You will process their data.

Grades: Grades will be based on quizzes associated with the asynchronous lectures (10%), associated assignments (10%), a final exam 20%, the field lab that you build (20%) and my overall grade for the monitoring plan (40%). **Yes, that is right, 40% of your grade in this class is based on the composite of everyone's work. When the rest of them screw up, it is a problem.** That previous sentence just described the rest of your life in natural resource management. You need to figure out how to make this happen in spite of personalities. If you hate "group work", that means that you generally hate the majority of natural resources field work. The entire field is basically a giant group project. Learn to work within that.

You will be expected to do an evaluation of each of your group members and I reserve the option to reduce your grade in the class by up to 10% based on lack of performance in the class. By that, I mean, you do not get "bonus points" for doing a good job, you get subtractions of points for not filling your roles.

One last thing, my exam for this class generally scare the heck out of people. It is completely essay. You are given access to any resource you want...the internet, your notes, discussion with other people in class (via zoom)...pretty much anything short of calling professionals to ask questions. You will; however, do your own work in the writing (no plagiarism) and will submit it to the dropbox.

Format for the Monitoring Plan (Note: this is modeling NPS and others)

Executive Summary (responsible party is the Project Coordination Team)

This is a single page that summarizes the whole things. This is kind of like an abstract.

Project Background (responsible party is the Project Coordination Team)

This will be about three paragraphs defining things like funding sources, involved partners.

Monitoring Plan Development Team (responsible party is the Project Coordination Team)

This will be all of you. This will be written like this:

Wildlife Team

Bob Bobson- Ecosystem Restoration and Management student at University of Wisconsin-Stevens Point.

Responsible for developing the woodcock and wood duck monitoring protocols.

Project Goals (responsible party is the Project Coordination Team)

This will be directly from the funding document. I will provide this.

Monitoring objectives (responsible party is the Project Coordination Team)

There will be one or more of these, written appropriately, for each group. Reference section for each

Documented Time (responsible party is the Project Coordination Team)

Presented in a table organized by team and person in team

This needs to be legally defensible, in the past people many people have been fired or jailed for billing in excess of hours expended...track these well).

Sections

- Project coordination (responsible party is the Project Coordination Team)
 - Timelines
 - Team meetings (dates, times, minutes in the appendix)
 - Field data collection dates (raw data in the appendix)
 - Protocol development (first draft in the appendix)
 - Protocol review teams (all names...both internal to the class and any externals that you want)
 - Public review (in case, full class review...all comments, in the appendix with response)
 - Response to feedback
- Wildlife (responsible party is the Wildlife Team)
 - Introduction (this will be a two or more pages that include peer-review articles/management guides on each focal organism. The articles should focus on habitat requirements and monitoring techniques.
 - Timeline for monitoring
 - Monitoring protocols (complete with photo guides, etc.)
 - Table of first year's data (if collected)
 - Reference to appendix for RAW data
- Historic Team (responsible party is the Historic Team)
 - Introduction (this will be a two or more pages that include as much information about the site history as you can collect)
 - Timeline for monitoring
 - Monitoring protocols (complete with photo guides and in your case, specific elements mapped)
 - Maps and tables
 - Reference to appendix for RAW data
- Plant communities (responsible party is the Plant Communities Team)
 - Introduction (this will be a two or more pages that include peer-review articles on monitoring of both the uplands and lowlands).
 - Timeline for monitoring
 - Monitoring protocols (complete with photo guides, etc.)
 - Table of first year's data (if collected)
 - Reference to appendix for RAW data

- Geospatial (responsible party is the Geospatial Team)
 - Introduction (this will focus on how other similar projects have chosen to store data, why you chose what you did and how to access the data)
 - Discussion of the metadata for each feature
 - Collection of appropriate figures (many may actually be in the other chapters; however, you will describe how they were made...what data was used, where it was collected, where it is available, etc. and reference each figure)
 - Geodatabase may be included in some format in this document or referenced to an online location. Issues will arise about what data can legally be stored there (i.e. invasive plants is fine) and what is privileged information (i.e. endangered species data is not publicly available)

Appendix (responsible party is the Project Coordination Team)

Schedule

Week	Asynchronous Lecture	Tuesday Lecture	Lab
1	Intro and indicators, read Moses Creek Restoration Plan, take the online quiz	Discuss the course and overall planning	Assign teams, Discuss Moses Creek Restoration, Discuss the overall project
2	Planning and monitoring and Mandatory monitoring	This will be focused on each group deciding on their plan for the project	Site Visit (for those that are not in both classes, they will take a van, the rest will be on a bus)
3	Focus on a technique: Birds, Mammals, Reptiles and Insects	First protocols in draft form	During first two hours, each group will schedule a meeting with Dr. Demchik to discuss their protocols, needs and issue...during the last hour, the class will come together and discuss the needs and issues
4	Focus on a technique: Plants and Plant Growth	Project Coordination Team will run this meeting, this will focus on how to develop the document into a full document	By today, your teams will have reviewed ALL protocols. The project coordination team will run this meeting. The goals are simple, this is the first review of all protocols, and, within a week, the full protocols for the class will be approved by the full class..
5	Data archiving, sampling statistics and internet resources	Teams will meet to finalize everything	This is the full discussion of next steps...by this class time, you will have everything except collected field data to the project coordination team. This seems early in the semester,
6	DNA	Final document review, ready to be printed and bound	Buffer and plant seedlings in the greenhouse
7		Historic Team Presents	Site visit focused on mapping/documenting historic elements (Historic Team coordinates this)

8		Plant Team Presents on their plan for monitoring the site	We will complete some monitoring for plants (this is coordinated by the Plants Team)
9		Wildlife Team presents on their plan	We will complete some monitoring of wildlife (this is coordinated by the Wildlife Team)...
10		Geospatial Team presents on protocols for data storage, database formats, other stuff	Zoom...the team will walk us through the full database and storage information (at this point, they should have everything stored, as all field collections has been done; this is coordinated by the geospatial team). At the end of this, the Project Coordination Team will discuss plans forward
11		Monitoring Plan Discussion	Monitoring Plan Presentation (Draft 1)
12		Monitoring Plan Presentation (Draft 2)	Real Deal Presentation: The project coordination team will use the last hour to complete any final edits to the document. By the end of the day, the final document will be turned in to me.
13		Special Topic: Sian Kaan and Cockscomb Basin	Implementation (Upland)
14		Special Topic:	Implementation (Tree planting and seeding)
15		Special Topic:	Final Site Visit with Site Tour for CNR Administration, RGS and DNR Fisheries

Forestry Anti-harassment Statement

Introduction

In adopting this statement, the forestry discipline within the College of Natural Resources (CNR), at the University of Wisconsin-Stevens Point (UWSP) has expectations for professional behavior of its students, staff, faculty, and other associated parties. Anyone who has a reasonable belief that they, or another student, staff, faculty or guest, have been the victim of harassment, bullying, or discrimination, or any other violation in the statement herein, are encouraged and expected to report the conduct. See reporting options and guidelines at the end of this document.

The forestry discipline within the College of Natural Resources is committed to creating a safe, inclusive, and professional environment. The forestry discipline operates under the UWSP harassment, discrimination, and retaliation prevention guidelines, copied here:

“The University of Wisconsin-Stevens Point (UWSP) is committed to fostering an environment that is safe, respectful, and inclusive to all and to educate all employees on these important issues. In addition, we are obligated, under Regent policy and federal regulations, to ensure our employees are informed on the issues of unlawful discrimination, harassment, and sexual violence.”

Statement

The forestry discipline, following the lead of the Society of American Foresters which accredits the B.S. forestry degree, believes we all have a responsibility in creating a safe, inclusive, professional environment in all forestry-related activities and events. All forms of discrimination, harassment, and bullying are prohibited. This applies to all participants in all settings (online and in-person) and locations (on- and off-campus) where forestry classes and associated activities are conducted, including student organization events and activities, committee meetings, workshops, conferences, and other work and social functions where employees, volunteers, sponsors, vendors, or guests are present.

Discrimination is prejudicial treatment of individuals or groups of people based on their race, color, creed, religion, age, sex, sexual orientation, gender identity or expression, national origin, ethnicity, ancestry, disability, pregnancy, marital or parental status, veteran status, or any other category protected by law.

Sexual harassment is unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature that creates an intimidating, hostile, or offensive environment. Sexual harassment constitutes discrimination and is illegal under federal, state, and local laws.

Bullying is unwelcome, aggressive behavior involving the use of influence, threat, intimidation, ridicule, hazing or coercion to dominate others in the professional environment. Bullying behavior may go beyond characteristics protected by applicable laws, including but not limited to, political views, dress, or other outward physical appearances.

Other types of harassment include any verbal or physical conduct directed at individuals or groups of people because of their race, ethnicity, color, national origin, sex, sexual orientation, gender identity, age, religion, disability, veteran status, or any other characteristic protected by applicable laws, that creates an intimidating, hostile, or offensive environment.

The following list, while not exhaustive, includes examples of unacceptable behavior: slurs, jokes, threats, or derogatory comments relating to the characteristics noted above. Examples of inappropriate physical harassment that violate this statement include, but are not limited to: assault, unwanted touching, or impeding or blocking movement. In addition, no individual may be denied admission to, or participation in or the benefits of, any UWSP-associated events. Similarly, the display or circulation of derogatory or demeaning posters, cards, cartoons, emails, texts, videos, and graffiti which relate to characteristics noted above violate this statement.

Reporting

Students, staff, faculty, or guests associated with Forestry-related programming who experience or witness incidents of harassment are strongly encouraged to report the incident. The Forestry discipline strongly urges the prompt reporting of complaints or concerns so that rapid and constructive action can be taken. Reporting can be done online or in person, to a faculty or staff member, and/or the UWSP Dean of Students. Anonymous reporting is available.

The UWSP Title IX Website is the home for all information related to harassment and discrimination, including reporting options, student and employee resources, and information about what happens after a report is submitted:

<https://www.uwsp.edu/titleix/Pages/default.aspx>

University of Wisconsin Stevens Point College of Natural Resources-Principles of Professionalism

The College of Natural Resources at the University of Wisconsin – Stevens Point prepares students for success as professionals in many fields. As a professional, there are expectations of attainment of several personal characteristics. These include:

Integrity

Integrity refers to adherence to consistent moral and ethical principles. A person with integrity is honest and treats others fairly.

Collegiality

Collegiality is a cooperative relationship. By being collegial you are respecting our shared commitment to student education through cooperative interaction. This applies to all involved in the process: students, staff, faculty, administration and involved community members. You take collective responsibility for the work performed together, helping the group attain its goals.

Civility

Civility refers to politeness and courtesy in your interactions with others. Being civil requires that you consider the thoughts and conclusions of others and engage in thoughtful, constructive discussion to express your own thoughts and opinions.

Inclusivity

Inclusivity requires you to be aware that perspective and culture will control how communication is understood by others. While many values are shared, some are quite different. These differences in values should be both considered and respected.

Timeliness

Timeliness is the habit of performance of tasks and activities, planned in a way that allows you to meet deadlines. This increases workplace efficiency and demonstrates respect for others' time.

Respect for Property

Respect for property is the appreciation of the economic or personal value an item maintains. Maintaining this respect can both reduce costs (increase the operable life of supplies and equipment) as well as demonstrate respect for others rights.

Communication

Professional norms in communication require that you demonstrate the value of your colleagues, students, professors or others. The use of appropriate tone and vocabulary is expected across all forms of communication, whether that communication takes place face to face, in writing or electronically.

Commitment to Quality

Quality is the ability to meet or exceed expectations. By having a commitment to quality, we intend to provide a learning environment that is conducive to learning. Intrinsic to this commitment to quality is defining expectation (committed to in a syllabus through learning outcomes), implementation (with quality control in place) and assessment (where meeting of learning outcomes is determined).

Commitment to Learning

Learning is a lifelong process. By being committed to learning you are providing a model for all to follow. This model is not only professor to student but involves all combinations of people within our university and broader community

Adherence to this compact is required of the faculty and staff of the College of Natural Resources and of all students enrolled in College of Natural Resources courses.