ACADEMIC SYLLABUS

Faculty:
Lead Instructor: Veronica Yovovich, PhD

Contact Hours:
We will be together all day, every day throughout the course. We will be working together in many different situations, and there will be plenty of time for small group engagement. If, at any point, you would like to have a one-on-one meeting please ask and either instructor will be happy to oblige.

Class Meetings:
This Wildlands Studies Program involves seven days per week of instruction and field activities, with one half-day off during the program for resupplying, showering, and laundry. Faculty and staff work directly with students 10+ hours a day and are available for tutorials and coursework discussion before and after scheduled activities. Typically, we begin each day at 6 am, with breaks for meals, rest, and study time. Most evenings contain scheduled activities, including guest lectures, structured study time, wildlife observation, and workshops. Each day’s activities tend to run very long, and may end as late as 10 pm (e.g., for wildlife observation). Since we will be spending almost all of our time outdoors, we will need to work around whatever weather conditions come our way. As such, it will be necessary to be flexible and able to accommodate a variety of class times and conditions. Fluctuations in weather, and tips on wildlife activity will have a significant impact on our daily plans. I cannot emphasize the need to be flexible enough. We will try to communicate changes in plan as they arise, and please know that this is likely to come up every day of the course.

Course Credit:
Wildlands Studies students receive credit for one undergraduate course:

ESCI 437A, Environmental Wildlands Studies (5 quarter / 3.35 semester credits)
Field-based course studying the environmental problems affecting the natural and human-impacted ecosystems of our study region, including the role of human interactions.

This course has distinct objectives, and we integrate teaching and learning through both formal coursework (i.e., readings, discussions, lectures, seminars, etc.) and experiential learning in the field. Academic credit is provided by Western Washington University with support from the Environmental Science Department in WWU’s Huxley College of the Environment. An extended description follows in the course description section of this syllabus.
Readings:
A Course Reader has been established for this class, a digital version will be provided to students in advance of the course. Students are responsible for bringing a printed copy with them (please print on both sides to save weight). **Do not bring a tablet or laptop in lieu of printing.** Readings include selections from academic primary literature, technical reports, book chapters, and environmental impact assessments and planning documents. Field guides and textbooks supplement our field activities and are an integral part of our program. We will carry a shared reference library of these on all activities and on backcountry trips.

Contents of this syllabus:
I. Program Overview
II. Learning Objectives
III. Course Description
IV. Assessment
V. Grading Scheme
VI. General Reminders
VII. Academic Schedule & Course Content
VIII. Reading List

I. Program Overview
Wildlands Studies’ Yellowstone Program allows participants to observe, study, and learn about some of the most magnificent wildlife species in North America. This American wilderness course enables students to see wildlife species – grey wolves, grizzly bears, bison, and more – rarely seen in the coterminous United States, and to reflect on the perspectives – local vs. regional, scientific vs. cultural, etc. – by which they, and the ecosystems on which they depend, are defined and managed.

We spend the first week of the course at a base camp in Yellowstone National Park. Most mornings, early, we will visit the Lamar Valley (aka “the Northern Range”) to find, observe, explore, and study a variety of habitats and wildlife species. We will spend the rest of the day and evening learning about various aspects of biology, ecology, conservation biology, and wildlife management as they relate to our focal species (particularly grey wolves, bison, and grizzly bears), and discuss the implications as they relate to Yellowstone National Park and the Greater Yellowstone Ecosystem.

In the process, students will acquire skills in making wildlife observations, locating and tracking animals, understanding wildlife behavior, and identifying a variety of native flora and fauna. Our hands-on field activities will be augmented by information exchanges with local community members, wildlife management experts, and conservation leaders as we explore the ecology of our study species and the complex management issues and controversies surrounding them.

Halfway through the course we leave the front-country behind and head into the spectacular Absaroka-Beartooth Wilderness for a six-day backpacking trip. During the backpacking segment, students continue their studies of wildlife habitat and ecology, with an emphasis on grizzly bear biology and recovery in the Yellowstone Ecosystem, and go deeper into the principles of conservation biology, natural resource management, and reserve design. Participants will also acquire basic backcountry skills that emphasize bear safety techniques, field navigation, team building, and group management.

Although the course is not taught in a classroom, the academic expectations are high. There will be additional challenges posed by factors such as long days, inclement weather, logistical changes, and physically demanding conditions. As such, we will get the most out of our experiences together if we bring along
flexibility, ample patience, a sense of humor, self-motivation, and perhaps most importantly, the desire to work as a team towards a common goal.

II. Learning Objectives

Following this course, students will have working knowledge of and experience in:

1. **Ecosystems and natural history of the Greater Yellowstone Ecosystem.** Species identification is essential to managing and understanding the communities in this region and for identifying change over time. Through readings, lectures, workshops, and journal assignments, students will learn to identify plant and animal species using field guides and taxonomic keys. In a series of field excursions, lectures, readings and discussions, students will understand the natural history of the Greater Yellowstone Ecosystem and be able to identify community types and the processes that underlie community development and change.

2. **The biological needs, behavior and ecology of key species in the Greater Yellowstone Ecosystem.** Every organism in the Greater Yellowstone Ecosystem has evolved life history characteristics that determine its ability to survive in a human-dominated landscape. We will focus on the interactions of charismatic species that are sensitive to human activities and/or highly valued by humans, specifically grizzly bear, grey wolf, bison, and elk. Through readings, lectures, discussions, journal assignments, and field studies, students will learn ecological concepts as they relate to these key species, and how human activity influences wildlife behavior and ecological relationships.

3. **The real-world application of the principles of conservation biology.** Human activities are impacting wildlife species at an unprecedented rate, increasing threats to the health and viability of wildlife populations everywhere, and the Greater Yellowstone Ecosystem is no exception. Through readings, lectures, workshops, and journal assignments, students will learn to recognize how the principles of conservation biology are playing out in the Greater Yellowstone Ecosystem, including proximal and ultimate causes of species decline and extinction, principles of habitat fragmentation and reserve design, and how these principles have (or have not) been used to develop management and recovery plans for threatened or sensitive species.

4. **The political, legal, and social dimensions of wildlife and endangered species management.** Following introductory lectures on the cultural, political, and management history of the Greater Yellowstone Ecosystem, students will have the chance to meet biologists, natural resource managers, tourism operators, and other local stakeholders who have very different perspectives on sustainability, management, and policy. Students gain additional insight into the political and management history through discussions and numerous readings.

5. **Field observation skills, including methods for documenting and sharing findings.** Field observation skills are an integral part of good science and promote understanding of the world around you. Through directed learning of biology and ecology in the region, students will gain experience observing the world around them and be able to identify changes. Students will be introduced to techniques for recording and presenting information (e.g., natural history sketching, field journaling, etc.) and gain experience using a variety of techniques to present natural history observations.

6. **Basic backcountry skills, including backcountry travel and safety, field navigation, and group management.** Although not the main focus of this course, students will learn the basics of how to plan for a prolonged backcountry trip, how to travel safely in the backcountry, and how to lead and manage a group. Each student will lead the group for one day, helping the instructors to plan, coordinate and implement the day’s activities. In addition, each student will be naturalist of the day, teaching their classmates about a particular aspect of local natural history.
These topics will be addressed through course readings, discussions, field activities, visits with local experts, exposure to ongoing research, extended backcountry excursions, lectures, and field research projects. Much of the learning will take place as small group discussion of the readings. It will be absolutely imperative that each student complete all of the required readings before the day’s class and actively participate in the discussion. In the group discussion, students will be expected to critically evaluate, analyze, and synthesize material from the readings, lectures, discussion, and field observations. Our overarching goal is to have students leave the course not only with extensive knowledge about this particular region, but also with broader skills and understanding of ecological, geological, and social sciences that allows them to critically evaluate information in other settings in their future lives and careers.

III. Course Description

We teach this course in an integrated format in the field. Students will receive transcript credit for the following course introduced on page 1:

**ESCI 437A, Environmental Wildlands Studies (5 quarter / 3.35 semester credits)**

Field-based course studying the environmental problems affecting the natural and human-impacted ecosystems of our study region, including the role of human interactions.

**Experiences/Activities**

Students will learn concepts and principles of environmental studies, conservation biology and ecology, as well as wildlife management and conservation planning methods, and data collection and analysis techniques. Students will examine outcomes of environmental policies and wildland/wildlife management, including both sociological and natural consequences, and evaluate environmental policy options. Along the way, students will consider concepts and principles of environmental research, ethics, land and wildlife management, and the role of culture in wildland management.

**Outcomes**

Students will gain the ability to critically read and evaluate scientific and policy literature, as well as texts written for popular audiences. Students will gain a knowledge base in wildland natural history and policy, with specific emphasis on the Greater Yellowstone Ecosystem. Students will discuss and critique the literature in light of other information they have learned in this program from local experts, lectures, personal observations, and other relevant readings. Students should be able to demonstrate understanding of basic ecological, management, and policy concepts as related to the Greater Yellowstone Ecosystem, including community ecology and species interactions, effects of climate change, and different management designations (e.g., park vs. wilderness). Students will be able to apply their knowledge of natural and social science to new scenarios and clearly demonstrate understanding of the material.

Students will develop skills in field observation and documenting and sharing observations. Students will employ varied techniques to present and record their natural history observations including, but not limited to, Grinnell-style Trip Logs and species accounts, natural history sketching, narrative writing, and mapping. Students will demonstrate practice and/or competence in a variety of formats.

Students will be able to conduct basic field research and be able to synthesize, organize, and present their data in a way that is appropriate to the audience and subject matter. Students will discuss their results in light of current management or conservation issues. Students will be able to demonstrate their understanding of the ecological and/or social science processes and concepts that underlie research.
IV. Assessment

The following is an overview of the academic requirements for the program. Some of the assignments are ongoing (journal and readings) and some have specific dates (Final Exam). Due dates are subject to adjustment in response to weather and logistic changes. Final grades for the course listed above will be based on the following items:

<table>
<thead>
<tr>
<th>Assessment Item</th>
<th>Date due</th>
<th>% of grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspen regeneration research project</td>
<td>6/24</td>
<td>5</td>
</tr>
<tr>
<td>Bison ethology research project</td>
<td>6/24</td>
<td>5</td>
</tr>
<tr>
<td>Field journal</td>
<td>7/01</td>
<td>20</td>
</tr>
<tr>
<td>Reading, discussions and class participation/leadership</td>
<td>6/18-7/03</td>
<td>25</td>
</tr>
<tr>
<td>Midterm exam (short answer/essay)</td>
<td>6/24</td>
<td>20</td>
</tr>
<tr>
<td>Final exam (short answer/essay)</td>
<td>7/02</td>
<td>25</td>
</tr>
</tbody>
</table>

**Research Projects (10%)**

Each student is required to participate in two field studies, one on trophic cascades (specifically, aspen regeneration) and one on bison behavior in Yellowstone National Park’s Lamar Valley. In each case, we will split up into small groups (3-4 people), and you will work together to gather and analyze data. The final grade includes detailed written reports of the results in your field journal, as well as preparation, participation and fieldwork (10% of final grade). Students will be evaluated on their participation during the collaborative fieldwork as well as on their specific contributions to the final written product.

**Field Journal (20%)**

The field journal is an integral part of the Yellowstone course. It serves as a learning tool, a place for reflection upon experience, and a record of your experience as a whole. You should plan on writing in it every day. The following is a summary of our expectations/recommendations and a rough outline of due dates throughout the course.

1. **Trip Log (4 total; 1 pt each)**
   The trip log is a structured, narrative record of an excursion. We are using a format that has drawn from the Grinnell-style field journal format (as explained in the Reader). It includes the basic orienting information, a general route description, natural history observations, species lists, approximate distances, travel times, and important route details. This log is a careful summary of observations and field notes taken throughout the day. This entry should take approx. 20-60 minutes to write-up, but can take longer depending on the day of record. You will record one day during the first week in Yellowstone National Park, and a minimum of three days during the backcountry trip during the second week (4 total).

2. **Extended Entries (1 total; 4 pts)**
   This entry should involve more extensive reflection and effort. The purpose of this is to allow students to focus on an aspect of their experience that they are most interested in. These can include entries such as poetry, detailed drawings or paintings, free-writes, or detailed natural history descriptions. For example, students in the past have included detailed study of edible plants, or focused study of certain taxa (e.g., mushrooms, moss, lichen, aquatic invertebrates), or reflections on the ethics of wildlife management. These entries still need orienting information. In order to receive credit they must be inspired by and related to this place.
3. **Naturalist of the Day (1 total; 4 pts)**
During the program students will be required to complete one structured in-depth natural history study in their journal. It will draw from observations made in species accounts combined with additional research from field observations, field guides, and other references. Specific requirements include observations about identification, habitat, life history, behavior, interactions with other species, etc. Each student will be required to make an oral presentation of their Naturalist of the Day study around the campfire.

4. **Species Account (1 total; 4 pts.)**
Each species account is an observation record for an individual species that is part of the Grinnell-style field journal. Though Grinnell kept accounts on all species he encountered, students should choose three species and keep more detailed observation records. At the back of the journal, leave a few blank pages for each species (plant, animal, insect, etc.), and add to the page each time the species is encountered. This is a dated encounter record, and should include information on location, behavior, slope, aspect, plant community, etc. Grinnell’s records have been used to reconstruct community changes over the past century in California, thus careful records have immense value over a longer time span.

5. **Point-Counter Point (1 total; 4 pts.)**
Students will pick a contentious topic from the materials covered on the point and create a diagram expressing the complexity of the issue. Students will identify each of the various stakeholders involved in the controversy, their various perspectives, and the values/evidence/scientific merits supporting and/or refuting the main points supporting the various positions. The write up could be turned in the form of a detailed and organized standalone diagram, or the student may choose to accompany the diagram with a short essay, bullet points, or other form of discussion. Regardless of the presentation method, students will need to demonstrate a thorough treatment and understanding of the complexity of the issue at hand, and how the various perspectives relate to one another.

NOTE: All journal entries must include orienting information including date, time, location, weather, and individuals present.

**Journal Grading Criteria:**
1. Orienting Information: All entries need orienting information, even if on the same day.
2. Consistency of entries: This refers to regular and consistent use of the journal, which you should write in every day.
3. Organized: You should be able to use your journal as a reference. Information should be accessible and related to specific dates and locations. Include a table of contents in the beginning so we can find specific assignments.
4. Neatness/Readability: Someone else should be able to use your journal as a reference (or grade it).
5. Diversity of Expression: We encourage you to use a diversity of journaling techniques. Avoid using only one form of expression. We will discuss in detail a variety of journaling techniques.
6. Detailed Observation: Attention to detail will improve your observation skills.
7. Effort: We expect to see your field journal improve throughout the course, and will assess this accordingly.

**Readings, discussion and class participation (25%)**
This is ongoing throughout the program and includes group discussions of most of the readings presented in the Course Reader, incorporating readings from ecology, natural history, social sciences, and wilderness and management theory (see the reading list below). We have tailored the discussions and reading choice to our backcountry location and current topic focus. We will cover the basics of reading scientific literature, magazine articles and essays early in the course, and will expect students to read on average one primary literature
Each student will be responsible for leading the discussion with a partner twice during the course. This pair will pay special attention to the readings for that day and lead the group discussion. In the team, students will bring up salient points, generate discussion questions, bring up places where they are confused as leaders or where they think their fellow students may get confused. This is a time to be critical and creative – discussion leaders are especially encouraged to design an activity related to the readings that will help everyone learn the material better. The journal write up should be done before the discussion takes place and should contain notes from the reading (this could be bullet points, an outline of the reading, or another format that displays intimate knowledge of the reading), discussion questions for the group, an outline of the activity if applicable, etc.

Readings, discussion and class participation (15 points)
The remainder of your participation grade will be determined by your general participation in course discussion, your engagement with presenters, the degree to which you participate in team activities (loading the vans, cleaning, cooking, etc.), and your general eagerness to be a present and contributing member of the group. As stated above, participating in group discussions can range from sharing a deep understanding of the reading, to asking questions that help us all gain clarity. The point is to show that you are engaging with the material and thinking about things critically.

Exams (Midterm: 20%, Final: 25%)
Each student will be required to complete two exams during the course, one midterm and one final. Each exam will consist of 10 short-essay questions based on readings, lectures and class discussions. The midterm exam is worth 20% of your final grade, and the final exam is worth 25%. The final exam will be cumulative, but will draw more heavily from the second half of the course.

V. Grading Scheme
To convert final grade percentages to letter grades for each course that will appear on your transcript, we will use the following grading scheme:

<table>
<thead>
<tr>
<th>Letter grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>92.5-100+</td>
</tr>
<tr>
<td>A-</td>
<td>90.0-92.4</td>
</tr>
<tr>
<td>B+</td>
<td>87.5-89.9</td>
</tr>
<tr>
<td>B</td>
<td>82.5-87.5</td>
</tr>
<tr>
<td>B-</td>
<td>80.0-82.4</td>
</tr>
<tr>
<td>C+</td>
<td>77.5-79.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Letter grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>72.5-77.4</td>
</tr>
<tr>
<td>C-</td>
<td>70.0-72.4</td>
</tr>
<tr>
<td>D+</td>
<td>67.5-69.9</td>
</tr>
<tr>
<td>D</td>
<td>62.5-67.4</td>
</tr>
<tr>
<td>D-</td>
<td>60.0-62.4</td>
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<tr>
<td>F</td>
<td>&lt; 60.0</td>
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</tbody>
</table>
VI. General Reminders

**Academic Integrity** is as relevant in this field course as it is at your home institution. Plagiarism, using the ideas or materials of others without giving due credit, cheating, or putting forth another student’s work as your own will not be tolerated. Any plagiarism, cheating, or aiding another to cheat (either actively or passively) will result in a zero for the assignment. Cases of academic dishonesty will be reported to your home institution.

**Assignment deadlines** are established to promote equity among students and to allow for ample assessment time for faculty before other assignments are due or other activities are to occur. Therefore, deadlines are firm and late work will receive, at a minimum, a 10% loss of grade points for each day they are late. If you believe that extenuating circumstances have prevented you from completing your work on time, make sure to discuss this with the relevant faculty as soon as possible and certainly before the work is due.

**Participation and attendance** are absolutely crucial throughout this program. Students are expected to make multiple contributions to every class discussion, ask questions of guest speakers, and be demonstrably engaged during every course activity. Because of the demanding schedule and limited time, all components of the program are mandatory (unless indicated) and missing even one lecture can have a proportionally greater effect on your final grade. Hence, it is important to be prompt and prepared (i.e., with required equipment) for all activities.

Students with special needs should meet with the lead faculty member as soon as possible to discuss any special accommodations that may be necessary.

VII. Academic Schedule & Course Content

Outlined in the following table, but subject to change. Readings may be added or changed, and activities will likely shift from day-to-day depending on weather, opportunity, guest speakers, etc. Please be ready to be flexible.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Lecture Topics &amp; Activities</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 18</td>
<td>Bozeman</td>
<td>AM: Meet at the Community Co-op, introductions; logistics, equipment and safety overview; food shopping</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>PM: Logistics and safety briefing</td>
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<tr>
<td>June 19</td>
<td>Gardiner</td>
<td>AM: Move camp to YNP.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>PM: Discussion: Intro to Yellowstone; intro to journaling and academic expectations</td>
<td></td>
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<tr>
<td>June 20</td>
<td>YNP</td>
<td>AM: Presentations from YNP biologists/staff</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>PM: Discussion: Northern Range/climate change</td>
<td></td>
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<tr>
<td>June 21</td>
<td>YNP</td>
<td>AM: Wildlife and habitat observations</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>PM: Discussion: Wolf mgmt. in YNP</td>
<td></td>
</tr>
<tr>
<td>June 22</td>
<td>YNP</td>
<td>AM: Wildlife and habitat observations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM: Guest lecture, Buffalo Field Campaign</td>
<td></td>
</tr>
<tr>
<td>June 23</td>
<td>YNP</td>
<td>AM: Discussion: trophic cascades; wolf, elk, aspen ecology</td>
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<tr>
<td></td>
<td></td>
<td>PM: Design/conduct field study</td>
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</tbody>
</table>
VIII. Reading List

Recommended Pre-Course Reading
We cover a great deal of content in this two-week course. It is highly recommended that students do some pre-course reading before they arrive, to familiarize themselves with the history, ecology and management of the Greater Yellowstone Ecosystem. A couple of these are available free on-line, while the others can be found at your local library or online bookstores.

2. *Yellowstone’s Northern Range: Complexity and Change in a Wildlands Ecosystem*. Available from Yellowstone National Park: https://archive.org/details/yellowstonesnort00mamm
5. Any of the numerous books dealing with Yellowstone wolves and bears by Hank Fisher, Gary Ferguson, Frank Craighead, Paul Schullery and Doug Smith.

Required Reading (as it appears in your Course Reader)
The Course Reader and required reading for the course will be provided via email as a PDF file about a month before the course begins. An itinerary will be included so you know which readings will be discussed each day. It is imperative that students read the assigned papers before discussion, as the course is short and moves quickly. It is also a very small group and it becomes clear very quickly who has done the reading and who has not. Every student is to contribute to every discussion, so it is very difficult to hide being unprepared for class. Many other books and scientific papers will be made available on these topics through the course library we have with us.