Upper-division Writing Requirement Review Form (12/1/08)

I. General Education Review – Upper-division Writing Requirement

<table>
<thead>
<tr>
<th>Dept/Program Subject</th>
<th>WBIO</th>
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<tbody>
<tr>
<td>Course(s) Title</td>
<td>Advanced Fisheries Science</td>
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<tr>
<td>Description of the requirement if it is not a single course</td>
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<td>The requirement is to take Ecology Lab and 2 of our upper division courses that are approved for the dispersed writing requirements. For the Aquatic Option, Freshwater Ecology (BIOL 366), Advanced Fisheries (WBIO 408), and Plant Form and Function (BIOL 316) currently count.</td>
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II. Endorsement/Approvals

Please type / print name
Signature
Date

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Lisa Eby</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone / Email</td>
<td>243-5984 ; <a href="mailto:lisa.eby@umontana.edu">lisa.eby@umontana.edu</a></td>
</tr>
<tr>
<td>Program Chair</td>
<td>Dan Pletscher</td>
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III. Overview of the Course Purpose/Description

Class description:
This course introduces some of the fundamental principles of inland fisheries ecology and management. Through a case study approach I hope that you begin to understand (1) the quantitative nature of fish population assessment, (2) the complexity of ecological interactions linking fish to other components of aquatic communities and ecosystems, and (3) the challenge of balancing multiple human values in managing fisheries resources.

IV. Learning Outcomes: Explain how each of the following learning outcomes will be achieved.

Student learning outcomes:
Identify and pursue more sophisticated questions for academic inquiry

Learning Objectives for Class:
- Apply basic principles of fisheries science to specific management and conservation problems.
- Learn basic design principles for fish population assessment in lakes, rivers and streams.
- Learn basic analyses techniques for examining inland fisheries data.
- Synthesize, interpret, and critically evaluate data.
- Provide written evaluations or reports that synthesize and describe the ecological and social considerations associated with the management issue.
- Evaluate available data associated with the management objective.
- Provide evidence supporting conclusions and recommendations, specifically logically link the evidence to recommendations.
- Practice correct sentence structure, spelling, and punctuation.
Find, evaluate, analyze, and synthesize information effectively from diverse sources (see [http://www.lib.umt.edu/informationliteracy/](http://www.lib.umt.edu/informationliteracy/))

Through the use of required readings within the primary literature of the field and incorporation of these papers into class lectures and discussion, we inform the students of important scholars and journals in the field. By including writing assignments that require students find peer-reviewed literature and incorporate that into their position papers (in this case on how we manage hybrids) as well as in their proposal, I feel that it teaches (1) the value of original scholarship and practice using the information to develop an original argument or position, (2) how to understand and search for information that may refute the research statement, and incorporate that argument into the writing, and (3) use citation tracking critically and understand its importance in various disciplines, and (4) know the citation style for the discipline.

Manage multiple perspectives as appropriate

As we discuss case studies and management objectives, we discuss the multiple perspectives regarding the value of the resource and how these objectives are set. In addition, students must write a 2 page (single-spaced) position paper (with citations) on the management of cutbows in the Rocky Mountains.

Recognize the purposes and needs of discipline-specific audiences and adopt the academic voice necessary for the chosen discipline

The assignments associated with reviewing management objectives use the appropriate format and voice for a scientific audience/management report. In addition, the proposal is a written document structured in a way that is appropriate for a fisheries biologist to apply to get funding.

Use multiple drafts, revision, and editing in conducting inquiry and preparing written work

Student will be getting feedback on writing assignments throughout the semester, but without revision. The proposals are reviewed by the instructor (Eby) and other students, revised, and resubmitted.

Follow the conventions of citation, documentation, and formal presentation appropriate to that discipline

Yes

Develop competence in information technology and digital literacy

Students are required to find background information and previous studies for their proposals. Appropriate citations are required. Most students are aware of the library databases and search engines by this time but I provide individual instruction to those who have not done these searches before.

V. Writing Course Requirements Check list

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement Met</th>
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<tbody>
<tr>
<td>Is enrollment capped at 25 students?</td>
<td>● Yes □ No</td>
</tr>
<tr>
<td>If not, list maximum course enrollment.</td>
<td></td>
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<tr>
<td>Explain how outcomes will be adequately met for</td>
<td></td>
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<tr>
<td>this number of students. Justify the request for</td>
<td></td>
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<tr>
<td>variance.</td>
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<td>Enrollment has not exceeded 20 students since 2003.</td>
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<tr>
<td>We could easily cap it at 25 if necessary</td>
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<tr>
<td>Are outcomes listed in the course syllabus? If</td>
<td>□ Yes □ No</td>
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<tr>
<td>not, how will students be informed of course</td>
<td></td>
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<tr>
<td>expectations?</td>
<td></td>
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<td>In addition specific oral and written instructions are given out with each assignment and with the proposal.</td>
<td></td>
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<tr>
<td>Are detailed requirements for all written</td>
<td>□ Yes □ No</td>
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<td>assignments including criteria for evaluation in</td>
<td></td>
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<tr>
<td>the proposal</td>
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<tr>
<td>There are some details on the syllabus for the proposal</td>
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<tr>
<th>Question</th>
<th>Answer</th>
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<tr>
<td>course syllabus? If not how and when will students be informed of written assignments?</td>
<td>required for the class. When proposal topics are due, we discuss more details regarding format, expectations, and I share examples of previous proposals.</td>
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<tr>
<td>Briefly explain how students are provided with tools and strategies for effective writing and editing in the major.</td>
<td>In addition to discussing the structure of assignments, proposals, and expectations in class. Anne Greene is speaking in my course to help students improve their scientific writing skills. Anne Greene has taught the WBIO Scientific Writing Course for several years.</td>
</tr>
<tr>
<td>Will written assignments include an opportunity for revision? If not, then explain how students will receive and use feedback to improve their writing ability.</td>
<td>☐ Yes ☐ No Students will be getting feedback on writing assignments throughout the semester, but without revision. The proposals are reviewed by the instructor (Eby) and other students, revised, and resubmitted.</td>
</tr>
<tr>
<td>Are expectations for Information Literacy listed in the course syllabus? If not, how will students be informed of course expectations?</td>
<td>☐ Yes ☐ No Through the use of required readings within the primary literature of the field and incorporation of these papers into class lectures and discussion, we inform the students of important scholars and journals in the field. By including writing assignments that require students find peer-reviewed literature and incorporate that into their position papers (in this case on how we manage hybrids) as well as in their proposal, I feel that it teaches (1) the value of original scholarship and practice using the information to develop an original argument or position, (2) how to understand and search for information that may refute the research statement, and incorporate that argument into the writing, and (3) use citation tracking critically and understand its importance in various disciplines, and (4) know the citation style for the discipline.</td>
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**VI. Writing Assignments:** Please describe course assignments. Students should be required to individually compose at least 20 pages of writing for assessment. At least 50% of the course grade should be based on students’ performance on writing assignments. Clear expression, quality, and accuracy of content are considered an integral part of the grade on any writing assignment.

<table>
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<tr>
<th>Category</th>
<th>Percentage</th>
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<tr>
<td>Formal Graded Assignments</td>
<td>20% Proposal. Other written assignments compose at least 20% of their grades with the assignment category on the syllabus.</td>
</tr>
<tr>
<td>Informal Ungraded Assignments</td>
<td>0%</td>
</tr>
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**VII. Syllabus:** Paste syllabus below or attach and send digital copy with form. The syllabus should clearly describe how the above criteria are satisfied. For assistance on syllabus preparation see: http://teaching.berkeley.edu/bgd/syllabus.html

Paste syllabus here.

**Biol 408 Advanced Fisheries Spring 2009**

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code.
**Instructor:** Lisa Eby, BRL 103, x5984, lisa.eby@umontana.edu

**Text:** Kohler, C.C. and W.A. Hubert (eds). Inland Fisheries Management in North America. American Fisheries Society. 1999. All of the addition readings are on electronic & paper reserve at the library. ERES class website (password: Fish09).

**Class time and location:** MWF 9:10-10:00am; Davidson Honors College 118

**Office hours:** Tuesday 11-noon; Wednesday 3-4pm

**Class description:**
This course introduces some of the fundamental principles of inland fisheries ecology and management. Through a case study approach I hope that you begin to understand (1) the quantitative nature of fish population assessment, (2) the complexity of ecological interactions linking fish to other components of aquatic communities and ecosystems, and (3) the challenge of balancing multiple human values in managing fisheries resources.

**Grading:**

**Proposal (20% of grade)**

*Short paragraph of idea due on March 23rd, Full proposal due April 20th, Revision due May 8th:*

*Paragraph of idea* should include the general issue, specific questions, where study may take place, and what type of methods may you use to address the questions.

*Proposals* should be no longer than ten pages, including figures, tables, and a brief resume of the principal investigator. The following information must be provided: (a) Principal Investigator name & affiliation; (b) Title of project; (c) Description of project: this section should include a brief introduction to the problem, your specific objectives, your study plan; (d) Expected benefit/results of project to fish management; (e) Proposed project schedule and timeframe (not longer than 2 years for the entire project); (f) Biographical information. Each person must provide a brief resume summarizing his/her qualifications and experience; (g) Budget Table (no more than $75,000 for the two years), you need to include salary (# people, # days, hourly pay), fringe (12% of salary for people you employ less than 6 months, 30% of salary for people you employ for longer), supplies needed to perform the project, travel ($0.42/mile and any per diem), equipment use or rental (boat days, etc), and equipment repair. Turn in 3 copies of your proposal.

Review of the proposal will be performed by myself and others in the class (each person will review 2 proposals). Proposals will be evaluated on organization, writing, scientific/technical merit, feasibility, and benefits to fisheries management. Review sheets will be provided. Students will have a week to complete the review and turn it in at the panel discussion evaluating which proposals will be funded, *April 27th.*

**Assignments (60%):** Computational and written assignments associated with river, stream, and lake management sections will be passed out in class throughout the semester. There will be several computational assignments associated with each case study and a final written summary associated with evaluating the management objectives. *Late papers and assignments: A 5% per day late penalty will be assessed unless prior arrangements are made.*

**Participation and Discussions (10%):** *Come to class* with the required readings completed so that you can *participate* in class.

**Field trip:** We have the opportunity to visit David Schmetterling (MFWP) in the field during March. MFWP professionals are busy and the field trip is mandatory.
Professional and Scientific Exposure: You will have a choice to participate in multiple potential activities this spring. To get full points you will have to do 2 of the following:

1) Go to the MTAFS meetings. To get credit for this activity, you must volunteer to help with the meeting, talk to a professional about their work and job, and be in talks for an entire day (make sure that I see you there and tell me who you talked to!).

   State Chapter of the American Fisheries Society Meeting: Feb 11-13th
   Red Lion Hotel, Kalispell MT

2) Go to the 3 aquatic ecologist job candidate teaching seminars and help us evaluate the best person. To document this activity, you can turn in your candidate evaluation sheets to me (I will forward them to the appropriate folks).

3) Go to 3 seminars related to aquatic issues (AFS Chapter sponsored talks, Wednesday noon 12-1pm seminars, job candidate research seminar, or Wednesday WBIO/OBE seminars 4-5pm). To document this activity, you must write 1 paragraph summarizing each seminar and turn it in within 1 week of the seminar.

Final Exam (10%): The final exam for this course will review the major concepts that were covered during the entire semester. Final Exam is May 12th from 10:10am - 12:10pm. No early exams will be given.

Schedule:
Jan 26th – Course description, evaluation, expected engagement

Jan 28th – What is fisheries management?

Jan 30th – General fisheries management framework
   Chapter 2 in Inland Fisheries Management

Feb 2nd - General fisheries management framework:
   Chapter 8 & 17.3-17.6 in Inland Fisheries Management
   Assignment 1: Read and answer questions on management plan

Feb 4th – River fisheries management
   Chapter 20 in Inland Fisheries Management

Feb 6th – Finish management / River monitoring designs

Feb 9th – Common techniques for Assessment
   Mark-recapture Chapter 6 section 6.3.1 in Inland Fisheries Management
Feb 9th – Designs and Assessment Complete

Feb 11th and 13th – No Class – Montana American Fisheries Society Meeting

Feb 16th – Holiday

Feb 18th – Case study: Conservation of Snake River cutthroat in Gros Ventre River, WY


Assignment 2: Estimating entrainment in the Gros Ventre River Basin

Feb 20th – Hybridization in the Gros Ventre: science and management


Feb 23rd – The controversy over management of cutthroat-rainbow hybrids

Assignment 3: 2 page (single-spaced) position paper (with citations) on the management of cutbows in the Rocky Mountains

Feb 25th – River fisheries impacts and current restoration activities


Feb 27th – David Schmetterling (MFWP): “Restoration of the Clark Fork River”

Readings TBA

Assignment 4: Monitoring and Assessment of the Clark Fork

March 2nd – Discussion “Restoration of the Clark Fork River”

March 4th – Wrap up and discussion of both river case studies

March 6th – No class out of town; think about topic for proposal; work on 2 pager

March 9th – Populations or metapopulations?


March 11th – Lake Fisheries Management

Chapter 22 in Inland Fisheries Management

March 13th – Creel surveys: data obtained & designs

Chapter 21 “Sampling the recreational fishery” in Fisheries Techniques (on ERES)

March 16th – Case Study: Flathead Lake

March 18th – Estimating population parameters (mortality)

Ch 6.3.2 Estimation of mortality rates (in Inland Fisheries Management)

Assignment 5 distributed: mortality estimates
March 20th - Estimating population parameters (growth, fecundity)  
Ch 6.3.3 Estimation of growth rates (in Inland Fisheries Management)

March 23rd - Science Writing and Components of a Proposal (Ann Greene)

March 25th – Estimating population parameters (recruitment)

March 27th - Population modeling - Yield models introduction – framework and assumptions  
Ch 6.4.1 – Ch 6.4.3 (in Inland Fisheries Management)

March 30th – April 3rd Spring Break

April 6th – Population modeling – Yield model assignment 6  
Are we achieving management objectives?  
(Computer Lab)

April 8th – Population modeling – matrix model introduction – framework and assumptions

April 10th - Population modeling – Matrix model assignment 7  
Can we do anything about new invasions?  
Chapter 15 in Inland Fisheries Management (Computer Lab)

April 13th – Factors that limit fish populations in lotic systems  

April 15th – Linking habitat and populations in stream fisheries management  
Chapters 18 in Inland Fisheries Management

April 17th – Common policy issues: water and access  
Stan Branshaw. A Buyer’s Guide to MT water rights. Trout Unlimited

April 20th – Complexities and Challenges of Managing Stream fish populations in the Blackfoot River Basin

April 22nd – Common techniques for assessments in stream

April 24th – Common techniques for assessments in stream  
Assignment 8: Restoration in the Blackfoot: Is it working? Recommendations for fishing regulations?

April 27th – Panel Review of Proposals: Review of students proposals due in class today

April 29th - Evaluating the success of stream restoration  

May 1st - Summary and discussion of stream case study

May 4th - Use of cultured fish in management

May 6th - Use of cultured fish in management: in class debate “Should we be stocking Pacific Salmon?”

May 8th – Class Wrap-up, Final Revision of Proposals due

May 12th - Final Exam 10:10-12:10