

Syllabus

Course: NRM 580 Fisheries Management (3 credits)
Semester: Winter 2009
Lecture: 6:00 - 8:50 PM, Wednesday, 211 Padnos Hall

Instructor: Dr. Carl Ruetz
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Office Hours: 2:00 - 3:00 PM, Wednesday
I will also be available to schedule an appointment.

Blackboard: Announcements, schedule changes, and grades will be posted online.

Text:

Guy, C.S., and M.L. Brown, editors. 2007. Analysis and interpretation of freshwater fisheries data. American Fisheries Society, Bethesda, Maryland. (Recommended)
Kohler, C.C., and W.A. Hubert, editors. 1999. Inland fisheries management in North America, 2nd edition. American Fisheries Society, Bethesda, Maryland. (Optional)
Murphy, B.R., and D.W. Willis, editors. 1996. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland. (Optional)

Prerequisites: BIO 215 General Ecology or equivalent, and one introductory course in statistics; or permission of instructor.

Goals & Objectives: This course will introduce students to the basic principles of fisheries management. It will prepare students to undertake future management decisions by emphasizing the approach and process that underlies sound management. The course objectives are to:

1. Provide an overview of the approach and process of fisheries management.
2. Introduce quantitative methods of fisheries assessment.
3. Cover tools used to manage fish populations and their habitats.
4. Expose students to current primary literature related to fisheries management.

¹ Please call my Muskegon telephone number to leave messages.

Tentative Schedule:

Date	Topic
1/7	<i>Lecture:</i> Introduction, historical background, & process of fisheries management (Kohler & Hubert, Ch. 1, 2)
1/14	<i>Lecture:</i> Fish sampling & gear bias <i>Discussion:</i> Management (Hansen & Jones 2008; Murawski et al. 2008); Fisheries journals (Mather et al. 2008)
1/21	<i>Lecture:</i> Statistics for fisheries management—experimental design, hypothesis testing, model selection, & repeated measures (Guy & Brown, Ch. 1, 3) <i>Discussion:</i> Statistics (Johnson 1999, Hoenig and Heisey 2001)
1/28	<i>Lecture:</i> Abundance estimation—closed & open population methods (Guy & Brown, Ch. 8) <i>Discussion:</i> Gear bias (Pierce & Tomcko 2003); Marine fisheries (Beddington et al. 2007)
2/4	<i>Lecture:</i> Estimating mortality rates (Guy & Brown, Ch. 6) <i>Discussion:</i> Abundance estimation—Peterson et al. (2004, 2005)
2/11	<i>Lecture:</i> Age & growth (Guy & Brown, Ch. 5) <i>Discussion:</i> Lead use in recreation (Goddard et al. 2008)
2/18	<i>Lecture:</i> Population dynamics—surplus-production, dynamic-pool, & age-structured models (Kohler & Hubert, pp. 155-162) <i>Discussion:</i> Human dimensions (Conway & Shaw 2008, Lichtkoppler et al. 2008)
2/25	Exam
3/4	Spring Break
3/11	<i>Lecture:</i> Stock & community assessment (Guy & Brown, Ch. 10, 9) <i>Discussion:</i> Water quality (Todd et al. 2008)
3/18	<i>No lecture! Michigan AFS meeting. I hope you can attend.</i>
3/25	<i>Lecture:</i> Recruitment (Guy & Brown, Ch. 4) <i>Discussion:</i> Ecosystem management (Ripple & Beschta 2006)
4/1	<i>Lecture:</i> Management actions—stocking & regulations (Kohler & Hubert, Ch. 14, 17) <i>Discussion:</i> Introduced fish (Thresher 2008); Fisheries economics (Heal & Schlenker 2008, Costello et al. 2008)
4/8	<i>Lecture:</i> Topic to be determined by class; Reference set due <i>Discussion:</i> Climate change (Schindler et al. 2008)
4/15	<i>Lecture:</i> Topic to be determined by class <i>Discussion:</i> Stocking (Pearson 2008)
4/22 Finals Week	<i>Presentations:</i> “Areas of Future Research” 6 – 7:50 PM

Discussion Papers & Other Readings: Papers are on E-reserve. Access the library's homepage (www.gvsu.edu/library/) and click on the "Course Reserve" link.

- Beddington, J.R., D.J. Agnew, and C.W. Clark. 2007. Current problems in the management of marine fisheries. *Science* 316:1713-1716.
- Conway, F., and W. Shaw. 2008. Socioeconomic lessons learned from the response to the federally-declared West Coast groundfish disaster. *Fisheries* 33(6):269-277.
- Costello, C., S.D. Gaines, and J. Lynham. 2008. Can catch shares prevent fisheries collapse? *Science* 321:1678-1681.
- Goddard, C.I., N.J. Leonard, D.L. Stang, P.J. Wingate, B.A. Rattner, J.C. Franson, and S.R. Sheffield. 2008. Management concerns about known and potential impacts of lead use in shooting and in fishing activities. *Fisheries* 33(5):228-236.
- Hansen, G.J.A., and M.L. Jones. 2008. The value of information in fishery management. *Fisheries* 33(7):340-348.
- Heal, G., and W. Schlenker. 2008. Sustainable fisheries. *Nature* 455:1044-1045.
- Hoenig, J.M., and D.M. Heisey. 2001. The abuse of power: the pervasive fallacy of power calculations for data analysis. *American Statistician* 55:19-24.
- Johnson, D.H. 1999. The insignificance of statistical significance testing. *Journal of Wildlife Management* 63:763-772.
- Lichtkoppler, F.R., F.L. Snyder, and K.E. Riesen. 2008. Ohio's 2006 Lake Erie charter fishing industry. *Fisheries* 33(10):485-494.
- Mather, M.E., D.L. Parish, and J.M. Dettmers. 2008. Mapping the changing landscape of fish-related journals: setting a course for successful communication of scientific information. *Fisheries* 33(9):444-453.
- Murawski, S.A., J. Boreman, S.K. Brown, G.J.A. Hansen, and M.L. Jones. 2008. Letters: to the editor—the value of information. *Fisheries* 33(11):560-561.
- Pearson, T.N. 2008. Misconception, reality, and uncertainty about ecological interactions and risks between hatchery and wild salmonids. *Fisheries* 33(6):278-290.
- Peterson, J.T., N.P. Banish, and R.F. Thurow. 2005. Are block nets necessary?: movements of stream-dwelling salmonids in response to three common survey methods. *North American Journal of Fisheries Management* 25:732-743.
- Peterson, J.T., R.F. Thurow, and J.W. Guzevich. 2004. An evaluation of multipass electrofishing for estimating the abundance of stream-dwelling salmonids. *Transactions of the American Fisheries Society* 133:462-475.
- Pierce, R.B., and C.M. Tomcko. 2003. Variation in gill-net and angling catchability with changing density of northern pike in a small Minnesota lake. *Transactions of the American Fisheries Society* 132:771-779.
- Ripple, W.J., and R.L. Beschta. 2006. Linking a cougar decline, trophic cascade, and catastrophic regime shift in Zion National Park. *Biological Conservation* 133:397-408.
- Schindler, D.E., X. Augrot, E. Fleishman, N.J. Mantua, B. Riddell, M. Ruckelshaus, J. Seeb, and M. Webster. 2008. Climate change, ecosystem impacts, and management for Pacific salmon. *Fisheries* 33(10):502-506.
- Thresher, R.E. 2008. Autocidal technology for the control of invasive fish. *Fisheries* 33(3):114-121.

Todd, A.S., M.A. Coleman, A.M. Konowal, M.K. May, S. Johnson, N.K.M. Vieira, J.F. Saunders. 2008. Development of new water temperature criteria to protect Colorado's Fisheries. Fisheries 33(9):433-443.

Grading & Evaluation: Grades will be calculated as a percentage of the total points possible (e.g., 93-100% = A, 90-92.9% = A-, 88-89.9% = B+, 82-87.9% = B, 80-81.9% = B-, etc). As a general policy, grades on all work are considered final (i.e., they will not be changed) 2 weeks after the work is returned to the student.

Midterm Exam	100
Final Exam (optional)	100
Reference Set	75
Presentation	50
Facilitations (25 pts. each)	50
Class Participation	50
<u>Assignments (25 pts. each)</u>	<u>175</u>
TOTAL	600

Exams— The midterm exam will be closed book, although a 1-page formula sheet can be used on the exam. The final exam will be a comprehensive, take-home exam (due during the final exam period). The final exam is optional. If the final exam is completed, then it will count as part of your grade regardless of whether the grade on the exam raises or lowers your overall grade in the course. The format of exams will be a combination of short answer, essay, and mathematical problems.

Reference Set/Presentation—Students will be required to compile an annotated bibliography that contains at least 20 references from the primary literature (i.e., journal article) on a topic of their choice related to fisheries management (10 of which must be published on or after 2003). For each reference, the student should briefly state the purpose of the article and its main findings in 2-4 sentences. At the end of the document, a section on “Areas for Future Research” should identify gaps in the current understanding of the topic and propose studies that could best address these gaps (maximum of 2 pages, double spaced). Your essay will serve as an outline for a more in-depth analysis of the topic that will be presented orally to the class.

Facilitation—Each student will facilitate at least two class discussions of an article from the primary literature. Discussions will be weekly and typically last 0.5-1 hour. Discussions will further explore topics covered in lecture and allow students an opportunity to better develop critical thinking skills. In addition to leading the discussion, the facilitator will turn in a typed (≤ 2 pages single spaced) critical review (covering scientific concepts, methods, and writing style) of the article. The job of the facilitator is to provide a brief overview of the paper and, *more importantly*, generate discussion on the paper. The facilitator should not monopolize the discussion.

Class Participation—This includes involvement in and facilitation of discussions, asking questions during lecture, and contributing to the understanding of concepts. Students are expected to read and prepare for all class discussions.

Assignments—There will be seven problem sets due throughout the semester. The topics to be covered are: Statistics, Abundance Estimation, Estimating Mortality, Estimating Growth, Population Models, Stock-Recruitment Models, and Stock Assessment. The problem sets will focus on quantitative methods. The goal of these exercises is to provide students an opportunity to apply the techniques and models covered in class. The emphasis of these exercises will be on both mathematical calculations and interpreting results. Problem sets will typically be due one week after the topic is covered in class.

Late work: As a general policy, late work will not be accepted unless arrangements are made in advance.

Special Needs: Students with learning or physical disabilities that may hinder their ability to fully participate in the course or achieve their potential should contact me and may also wish to contact the Disability Support Services (200 Student Services Building; phone: 616-331-2490; www.gvsu.edu/dss/).

Academic Honesty: Students are expected to follow GVSU's Student Code, which is outlined in *Section 223: Integrity of Scholarships and Grades* (<http://www.gvsu.edu/studentcode/>).