

Freshwater Fisheries Management Syllabus

ENR 4342 Spring 2024

Course Information

- **Course times and location:** Mondays, Wednesdays, and Fridays; 1:50–2:45 p.m., Kottman Hall, Room 370
- **Credit hours:** 3
- **Mode of delivery:** In-person

Instructor

- **Name:** Eugene Braig
- **Email:** braig.1@osu.edu
- **Phone:** 614-292-3823
- **Office:** 379a Kottman Hall or osu.zoom.us/j/93316967686?pwd=ekR4WGZ5am1SRINPRXp1a1JTT092QT09
- **Office hours:** by appointment (I'm often easily available immediately after class)
- **Preferred means of communication:**
 - My preferred method of communication for questions is **email** or my Zoom office "space."
 - My class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your [notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to be sure you receive these messages.

Teaching Assistant

- **Name:** Benjamin Zeiger
- **Email:** zeiger.17@buckeyemail.osu.edu
- **Phone:** [no OSU number]
- **Office:** 382 Kottman Hall
- **Office hours:** By appointment
- **Preferred means of communication:** Email



Course Prerequisites

ENR 3300 or permission of instructor

Course Description

Catalog description: Ecological principles applied to conservation and management of aquatic organisms, especially fishes. Principles of fisheries management including some discussion of social and economic factors.

This course is an introduction to the conceptual elements of inland fisheries management as practiced in North America. It will provide fisheries and wildlife students with background information for future courses and the profession. It is also organized to provide useful information to students who may not have the opportunity to take other courses in this field.

Learning Outcomes

By the end of this course, students should successfully be able to:

Course goals

- Understand the various meanings of the term “fisheries” and what “management” in a fisheries conservation context implies.
- Understand the rate functions that structure exploited aquatic populations.

Course objectives

- Recognize and define the diverse concepts that constitute “fisheries” and their management.
- Demonstrate knowledge of the history of fisheries conservation and sport fishing.
- Demonstrate basic knowledge of the biology and ecology of select organisms important to fisheries management in Ohio and North America.
- Identify common issues associated with different fisheries habitats.
- Identify and define the three rate functions that structure exploited populations and the relationships among them.
- Select appropriate procedures to calculate population indices commonly used by fisheries managers.
- Demonstrate basic understanding of the influence of population rate functions in making fisheries management and conservation decisions.



Course goals

- Understand the development, use, and revision of policy/regulation to attain management objectives.
- Increase ability to professionally communicate knowledge about subject matter.

Course objectives

- Recognize and define the steps associated with policy formulation and assessment.
- Demonstrate knowledge of the regulatory use of quantitative indices as indicators of aquatic ecosystem health.
- Incorporate an appreciation for competing interests in decision-making processes and recognize that compromise is a necessary component of fisheries management.
- Explore professional fisheries management literature and evaluate and incorporate sources in writing.
- Create a professional-style document adhering to a prescribed professional format.
- Evaluate the professional writing of peers in a formal peer-reviewer context.

How This Course Works

Mode of delivery: The university prioritized in-person course delivery as of spring 2022. Classroom sessions are scheduled Mondays, Wednesdays, and Fridays from 1:50–2:45 p.m. However, I recognize that the recent public-health situation has been dynamic, and I can't predict how it might change over the course of the semester. Please be mindful of potentially changing policies by following the [Safe and Healthy Buckeyes page](https://safeandhealthy.osu.edu) (safeandhealthy.osu.edu). By rule, an in-person course can have up to 25% of its time be virtual. **However, I will only use online/virtual lecture-delivery options if it becomes absolutely necessary.** If you become ill or cannot attend class for some health-related reason, please inform teaching staff as soon as possible so accommodation can be arranged.

Your homework assignments and notification of other work will be found on CarmenCanvas and can be completed around your own schedule during the week.

Pace of activities: This course is divided into **modules**. Students are expected to keep pace with deadlines but may schedule their efforts freely within that time frame.

Credit hours and work expectations: This is a 3 credit-hour course. According to [Ohio State bylaws on instruction](https://go.osu.edu/credithours) (go.osu.edu/credithours), students should expect around 3 hours per week of time spent on direct instruction in addition to 6 hours of homework (reading and assignment preparation, for example) to receive an average grade.

Attendance and participation requirements: Research shows regular participation is one of the highest predictors of success. With that in mind, I have the following expectations for everyone's participation:

- **Participating in online activities for attendance: at least once per week**
You are expected to log in to the course in CarmenCanvas every week. During most weeks you will probably log in many times. If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible*.
- **Course meetings and office hours:**
Your attendance at all lecture sessions is expected but is not considered in grading. (That said, historically, those who have not performed well in this course tend to be chronically absent. Behave responsibly in this regard.)

Course Materials

Required Materials

- Hubert, W. A., and M. C. Quist, editors. 2010. Inland fisheries management in North America, third edition. American Fisheries Society. Bethesda, MD. (*Hard copy expected to be kept in closed reserve at the FAES Library.*)

Optional/Supplemental Materials

Fisheries-management texts:

- Austin, M., H. Devine, L. Goedde, M. Greenlee, T. Hall, L. Johnson, and P. Moser. 1996, 2015. Ohio pond management handbook: a guide to managing ponds for fishing and attracting wildlife. Ohio Department of Natural Resources, Division of Wildlife, Columbus, OH. (*Available for free via the Ohio Department of Natural Resources' web site or Division of Wildlife district offices.*)
- Carlander, K. D. 1969. Handbook of freshwater fishery biology, vol. 1. Iowa State University Press, Ames.
- Carlander, K. D. 1977. Handbook of freshwater fishery biology, vol. 2: Life history data on centrarchid fishes of the United States and Canada. Iowa State University Press, Ames.
- Carlander, K. D. 1997. Handbook of freshwater fishery biology, vol. 3: Life history data on ichthyopercid and percid fishes of the United States and Canada. Iowa State University Press, Ames.
- Kohler, C. C., and W. A. Hubert, editors. 1999. Inland fisheries management in North America, second edition. American Fisheries Society, Bethesda, MD.
- Murphy, B. R., and D. W. Willis, editors. 1996. Fisheries techniques, second edition. American Fisheries Society, Bethesda, MD.
- Zale, A. V., D. L. Parrish, and T. M. Sutton, editors. 2013. Fisheries techniques, third edition. American Fisheries Society, Bethesda, MD.

Field guides and systematic texts:

- Barton, M. 2006. Bond's biology of fishes, 3rd edition. Thomson–Brooks/Cole, Belmont, CA.
- Hubbs, C. L., and K. F. Lagler (G. R. Smith, rev.). 2004. Fishes of the Great Lakes Region, revised edition. University of Michigan Press, Ann Arbor.
- Ohio Department of Natural Resources (ODNR), Division of Wildlife. 2011. Stream fishes of Ohio: field guide, Pub. 5127 (0511). ODNR, Columbus. (*Available for free via*



the Ohio Department of Natural Resources' web site or Division of Wildlife district offices.)

- Page, L. M., and B. M. Burr. 2011. A field guide to freshwater fishes, North America north of Mexico: Peterson field guide series no.42, second edition. Houghton Mifflin Co., Boston.
- Page, L. M., H. Espinosa-Pérez, L. T. Findley, C. R. Gilbert, R. N. Lea, N. E. Mandrak, R. L. Mayden, and J. S. Nelson. 2013. Common and scientific names of fishes from the United States, Canada, and Mexico, 7th edition: Special Publication 34. American Fisheries Society, Bethesda, MD.
- Rice, D., and B. Zimmerman. 2018. A naturalist's guide to the fishes of Ohio. Ohio Biological Survey, Columbus.

Required Equipment

- **Computer:** current Mac (MacOS) or PC (Windows 10 or higher).
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology you need to succeed in this class, review options for [technology and internet access](https://go.osu.edu/student-tech-access) (go.osu.edu/student-tech-access).

Required Software

Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Visit university's [Microsoft 365 page](https://microsoft365.osu.edu/) (microsoft365.osu.edu/) and [student FAQ](#) (also linked from the previous url) for detailed information and instruction.

CarmenCanvas Access

You will need to use [BuckeyePass](https://buckeyepass.osu.edu) (buckeyepass.osu.edu) multi-factor authentication to access your courses in CarmenCanvas. To ensure that you are able to connect to CarmenCanvas at all times, it is recommended that you do each of the following:

- It can be useful to register multiple devices in case something happens to your primary device.
- You can request passcodes to keep as a backup authentication option. Passcodes will be good for 365 days that can each be used once.
- Install the Duo Mobile application on all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

At the time of this writing (December 2023), many of the links to help articles on some BuckeyePass pages seem to be functioning but were returning 404 errors in the recent past. Finding assistance may require some effort or a call to the help desk (listed below) if that situation returns. For assistance, visit the [BuckeyePass](https://buckeyepass.osu.edu) (buckeyepass.osu.edu) and note the articles linked under "Helpful Links" and information listed under "How?" in particular. If none



of these options will meet the needs of your situation, you can contact the IT Service Desk at [614-688-4357 \(HELP\)](tel:614-688-4357), and IT support staff will work out a solution with you.

Technology Skills That May Be Needed for This Course

- Basic computer and web-browsing skills
- [Navigating CarmenCanvas](https://go.osu.edu/canvasstudent) (go.osu.edu/canvasstudent)
- [CarmenZoom virtual meetings](https://go.osu.edu/zoom-meetings) (go.osu.edu/zoom-meetings)

Technology Support

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week.

- **Self Service and Chat:** go.osu.edu/it
- **Phone:** [614-688-4357 \(HELP\)](tel:614-688-4357)
- **Email:** servicedesk@osu.edu

Grading and Faculty Response

How Your Grade is Calculated

Your grade will be based on a total of 1,000 points. Understanding that there are different learning styles and that different students excel in different areas, opportunities for student evaluation will be presented in three categories, each comprising an approximate third of the total grade: simple homework calculations, exams, and written assignments.

Category	Assignment	Points
Homework	• Conference attendance	50
	• Population estimation	50
	• Age and growth	50
	• Relative weight	50
	• Diet indices	50
	• Fisheries assessment	50
	Subtotal: 300	
Writing	• Annotated bibliography	75
	• Draft term paper	50
	• Term paper	150
	• Peer review	75
Subtotal: 350		
Exams	• Midterm 1	100
	• Midterm 2	100
	• Final	150
Subtotal: 350		
		Total: 1,000

See [Course Schedule](#) for due dates.

Descriptions of Major Course Assignments

Homework

Description: Homework assignments ordinarily involve simple calculations designed to familiarize students with some common indices associated with fisheries management. With some exception, they will be issued and discussed on Mondays and be due the following Friday. Homework assignments can be submitted electronically via CarmenCanvas or in hard copy. Please see CarmenCanvas for more details and an up-to-date schedule. Note that late assignments will be penalized 10% of earned credit per day.

Writing

Description: You will select a unique topic as a subject for your annotated bibliography and for later elaboration in a term paper crafted to emulate a submission to a professional journal. Detailed expectations for written assignments will be provided in supplemental handouts. The bibliography and term paper assignments will be discussed during the first or second week of class. Your term paper will be submitted in a format prescribed by Fisheries magazine's Guide for Authors (<https://fisheries.org/books-journals/fisheries-2/fisheries-guides-for-authors/>). Written assignments in general will adhere to a formal style as prescribed by *A Guide to [American Fisheries Society] Publications Style* (the style guide will be provided via CarmenCanvas). You must formally cite the ideas and words of your research sources. Writing assignments will be submitted electronically via CarmenCanvas and must be readable using MS Word (note that conversion to docx from pdf may compromise formatting). Please note the 10% penalty per day for late assignments. This will be strictly enforced, so please plan ahead!

Exams

Description: Examinations will be divided among multiple choice, questions requiring short answers or brief essays, lists, and simple calculations. The final examination will be comprehensive, requiring an integration of concepts presented throughout the course. Exams will be proctored in class and must be completed within a set amount of time (ordinarily the duration of regularly scheduled lecture periods). Makeup exams will be offered only under extreme circumstances and may be oral or consist of supplementary essay assignments.

Academic integrity

Your assignments should be your own original work. You must formally cite the ideas and words of your research sources. Written assignments may be electronically assessed for potential plagiarism. You are encouraged to ask a trusted person to proofread your assignments before you turn them in, but no one else should revise or rewrite your work.

Late Assignments

Assignments will be submitted electronically via CarmenCanvas. Please refer to CarmenCanvas for due dates. Due dates are set to help you stay on pace and to allow timely feedback that will help you complete subsequent assignments. All late assignments will be



penalized 10% per calendar day. I don't feel this to be exorbitant, so exceptions to this policy are almost never granted. Please plan accordingly. If you are facing extenuating circumstances such as illness, please reach out to me as soon as possible to discuss your situation. Documentation may be required.

Instructor Feedback and Response Time

I am providing the following list to give you an idea of my intended availability throughout the course. Remember that you can call [614-688-4357 \(HELP\)](tel:614-688-4357) at any time if you have a technical problem.

- **Preferred contact method:** If you have a question, please contact me first through my Ohio State email address. I will reply to emails as soon as possible, usually within **24 hours on days when class is in session at the university**.
- **Class announcements:** I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check [your notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Discussion board:** I will check and reply to messages in the discussion boards as they appear. Let me know if a message has somehow been missed.
- **Grading and feedback:** For assignments submitted before the due date, I will try to provide feedback and grades within **seven days (exception:** writing assignments require substantially more time to evaluate). Assignments submitted after the due date may have reduced feedback and grades may take longer to be posted.

Grading Scale

93–100: A
 90–92.9: A-
 87–89.9: B+
 83–86.9: B
 80–82.9: B-
 77–79.9: C+
 73–76.9: C
 70–72.9: C-
 67–69.9: D+
 60–66.9: D
 Below 60: E

Other Course Policies

Academic Integrity Policy

See [Descriptions of Major Course Assignments](#) for specific guidelines about collaboration and academic integrity in the context of this class.

Ohio State's Academic Integrity Policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's [Code of Student Conduct](#) (studentconduct.osu.edu), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- [Committee on Academic Misconduct](#) (go.osu.edu/coam)
- [Ten Suggestions for Preserving Academic Integrity](#) (go.osu.edu/ten-suggestions)
- [Eight Cardinal Rules of Academic Integrity](#) (go.osu.edu/cardinal-rules)

Copyright for Instructional Materials

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form at equity.osu.edu,
2. Call 614-247-5838 or TTY 614-688-8605,
3. Or Email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member."

This course adheres to The Principles of Community adopted by the College of Food, Agricultural, and Environmental Sciences. These principles can be found at go.osu.edu/principlesofcommunity. For additional information on Diversity, Equity, and



Inclusion in CFAES, contact the CFAES Office for Diversity, Equity, and Inclusion (<https://cfaesdei.osu.edu/>).

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, [on-demand mental health resources](https://go.osu.edu/ccsondemand) (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at [614- 292-5766](tel:614-292-5766). **24-hour emergency help** is available through the [National Suicide Prevention Lifeline website](https://suicidepreventionlifeline.org) (suicidepreventionlifeline.org) or by calling [1-800-273-8255\(TALK\)](tel:1-800-273-8255). [The Ohio State Wellness app](https://go.osu.edu/wellnessapp) (go.osu.edu/wellnessapp) is also a great resource.

David Wirt, wirt.9@osu.edu, is the CFAES embedded mental health counselor. He is available for new consultations and to establish routine care. To schedule with David, please call 614-292-5766. Students should mention their affiliation with CFAES when setting up a phone screening.

Accessibility Accommodations for Students with Disabilities

Requesting Accommodations

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with [Student Life Disability Services \(SLDS\)](https://slds.osu.edu/) (slds.osu.edu/). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. In light of the recent pandemic, students seeking to request COVID-related accommodations may do so through the university's [request process](https://slds.osu.edu/covid-19-info/covid-related-accommodation-requests/) (slds.osu.edu/covid-19-info/covid-related-accommodation-requests/), managed by Student Life Disability Services; note that these accommodations were substantially revised in AU2023.

Disability Services Contact Information

- Phone: [614-292-3307](tel:614-292-3307)
- Website: slds.osu.edu
- Email: slds@osu.edu
- In person: [Baker Hall 098, 113 W. 12th Avenue](#)

Accessibility of Course Technology

This course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations as early as possible.

- [CarmenCanvas accessibility](https://go.osu.edu/canvas-accessibility) (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- [CarmenZoom accessibility](https://go.osu.edu/zoom-accessibility) (go.osu.edu/zoom-accessibility)

Course Schedule

Refer to the CarmenCanvas course for up-to-date due dates.

Week	Recommended reading (Hubert and Quist, chapters)	Topic
1	1, 4, 5, 6	Course introduction, fisheries management overview
2–4	2 (etc.)	Introduction to ichthyology and fish physiology and ecology
4–6	2, 3, 11, 14	Fishery assessments
6–7	10	Watersheds and lotic habitats
8	13	Lentic habitats
8–9	8, 9	Management of/with introduced fishes
10–11	7, 12	Managing with regulations
12	18, 19, 20, 21	Management of flowing-water fisheries
13	16, 17	Management of impoundment fisheries
14–15	15, 16, 17	Management of natural-lake fisheries and misc.

Week	Monday	Wednesday	Friday
1: January 8–12	Lecture: Fisheries intro.	Lecture: Fisheries history.	Lecture: Fisheries and communications. Term-paper topics assigned.
2: January 15–19	Martin Luther King, Jr. Day: No classes.	Lecture: Intro to ichthyology and Families of Ohio fishes.	No Lecture. (Ohio Wildlife Management Assoc. Conference, Jan. 19.)
3: January 22–26	Lecture: Families of Ohio fishes.	Lecture: Families of Ohio fishes.	Lecture: Fishes of Ohio update. Conference assignment tentatively due. (Ohio Aquaculture Association Conference, Jan. 26–27.)
4: January 29–February 2	Discussion and exercise: Population estimation.	Lecture: Fish physiology, growth, and reproduction.	Lecture: Basic fisheries statistics and indices. Homework due.
5: February 5–9	Discussion and exercise: Length-at-age estimation.	Lecture: Basic fisheries statistics and indices.	Lecture: Basic fisheries statistics and indices. Homework due.
6: February 12–16	Midterm 1.	Lecture: Social information and survey data.	Lecture: Watershed and stream habitats. Annotated bibliography due.
7: February 19–23	Discussion and exercise: Condition indices.	Lecture: Watershed and stream habitats.	Lecture: Scenic rivers and stream assessments. Homework due. (Ohio Natural History Conference, Feb. 24.)
8: February 26–March 1	Lecture: Managing with introduced fishes.	Lecture: Reservoir and lake habitat.	Lecture: Aquaculture in Ohio. Term paper draft due.
9: March 4–8	Discussion and exercise: Diet indices.	Lecture: Fish species selection for stocking programs.	Lecture: Aquatic invasive species. Homework due.
March 11–15	Spring-break week (although it's technically still winter): no classes (Ohio Chapter of the American Fisheries Society annual conference, March 14–15.) (Ohio Wildlife Diversity Conference, March 14.)		
10: March 18–22	Lecture: Fisheries regulations.	Lecture: Ohio regulation case study.	Lecture: Aquatic organisms as indicators of ecosystem health.
11: March 25–29	Midterm 2.	Lecture: Aquatic endangered species.	Movie and discussion: Larval fishes. Term paper due.
12: April 1–5	Lecture: Cold- and warmwater stream fisheries.	Lecture: Big-river fisheries.	Lecture: Anadromous fisheries. Peer review due.
13: April 8–12	Discussion and exercise: Fisheries assessment.	Lecture: Pond fisheries.	Lecture: Reservoir/ Impoundment fisheries. Homework due.
14: April 15–19	Lecture: Natural-lake fisheries.	Lecture: Great Lakes fisheries.	Elective lecture: TBD
15: April 22	Open review session.		

Final exam: Tuesday, April 30, 2024, 4:00–5:45 p.m.