

# **The Origins of Fish and Wildlife Management**

## ***Evolution, Genetics and Ecology***

**Credit hours:** 3

**Course objectives:** Origins of Fish and Wildlife Management – Evolution, Genetics and Ecology (FW 360) examines genetics and human interactions with fisheries and wildlife from an ecological and evolutionary perspective.

**Course content:** This is an e-campus course so there are no classroom lectures. The student is expected to spend 8-10 hours a week reading the uploaded materials in Blackboard, preparing the weekly assignment and participating in the Discussion Forum. (see detailed Syllabus below)

**Students for whom the course is intended:** Fisheries and Wildlife majors, Natural Resources majors, and students from other departments with an interest in evolution, genetics and ecology. We consider how humans, as a species, interact with other species and their environments.

**Prerequisites:** The course is intended for any student who has completed at least two (2) quarters of courses at OSU (or equivalent). It will be open to students in all disciplines, with no formal prerequisite course requirements.

**Text:** There will be one required text book: Belk, C. & V. Borden. 2006. *Biology: Science for Life*. Second Edition. Pearson Prentice Hall, Pearson Education, Inc., Upper Saddle River, New Jersey, USA. (2007 e-textbook available at reduced cost). ISBN-10: 0132276739 ISBN-13: 9780132276733

**Term papers:** One short final paper submitted in Week 9.

**Testing:** No exam or quizzes. One reading report (précis) submitted per week.

**Learner Outcomes:** As a result of taking this class, students will:

1. Appreciate science as a way of learning and knowing.
2. Possess an up-to-date perspective on how the discoveries of evolution and genetics changed how we view the world today;
3. Grasp molecular biology's progress from basic genetics to the most recent understanding of RNA's role as the cell's operating system;
4. Understand how species, including humans, populated continents and changed ecosystems;

5. Apply these basic principles of evolution, genetics, and ecology to fisheries and wildlife management and research.

### **Week-By-Week Syllabus:**

- **Week 1** *Introduction* “**To Harvest, To Hunt**”

Humans have enquiring minds. We try to understand and explain our world. For thousands of years, indigenous people on different continents have classified animal species and medicinal plants. We will study when and how the concepts of genetics and evolution originated and changed the way we view the world today. Biology helps us to explain our place in the universe and it explains humanity itself.

- **Week 2** *The monk, the pea and the corn cob* (**An Introduction to Genetics**)

Replicating molecules, genes -- the genome. Carrying and transmitting vital information – why? The mechanics of genes. Are we trapped by predetermined information? Cultural transmission vs. genetic inheritance? What are the influential characters? Why is natural selection so important?

- **Week 3** *Concepts of evolution: Darwin, Wallace and Banks* (**Genetics and Heredity over Time**)

Making sense of biodiversity. The 18th century collector’s dilemma in the golden age of global exploration. Different tools and conclusions of biologists in the field and taxonomists in museums: Buffon vs Banks and Darwin. Voyage of HMS Beagle. Molecular genetics and heredity markers have changed the science of systematics. Phylogenetics and extinctions. Splendid isolation of island species evolution and adaptation. Australia and Madagascar.

- **Week 4** *Discovery of DNA: Watson, Crick and Franklin* (**Birth of Modern Genetics**)

What carries on our inner message and how? Replication. The interplay between DNA and proteins. Children look like their parents but not exactly. The zipper of life, the essence of humanity. Why we share 25% of our genome with a banana. If we share 98% of our genes why are we not like chimps? Are genes for proteins that important? Readings from Richard Dawkins, Olivia Judson, and Stephen Jay Gould.

- **Week 5** *Biology’s Big Bang: RNA’s role as the cell’s operating system* (**Modern Genetics**)

Why DNA was not enough. We thought DNA explained everything and that RNA merely fetched and carried the message. The big shake up in molecular biology. Now we are discovering the big role that RNA plays as the powerful regulator of what goes on in our cells. RNA in humans and chimpanzees is noticeably different. Our understanding of how RNA works is still in its infancy but RNA could provide an alternative evolutionary substrate – acquired characteristics during a lifetime. Genetic imprinting and gene silencing. Back to Lamarck?

- **Week 6** *From Whence Diversity: the Devonian Explosion* (**Genetics over millennia**)

How the earth was populated with “endless forms most beautiful” and why. Continental drift and isolation. Darwin in the Galapagos: ‘I have seen the Pleistocene.’

- **Week 7 Ecology and Adaptive Radiation: Bad genes or bad luck (Ecological Genetics)**  
The concept of ecological niches populated at different times. Capybara and pigmy hippos. Why sea otters are grazers and not top predators.

- **Week 8 Man's Role in Shaping Biodiversity (Artificial selection)**  
The explosion of the human species – the Anthropocene Era. How agriculture and animal domestication allowed us to thrive ... with some exceptions. Humans as top predators on every continent. Extinctions. Fisheries collapse. Fish and Wildlife Management?

- **Week 9 The Past: Forensics of Evolution (Genealogy and Genetics)**  
Tracing our history through DNA – our African origins. The IBM/National Geographic DNA tracking project. China's exploration of the globe in 1421 and the DNA clues that were left behind.

- **Week 10 The Future: What next? Will present ecological crises determine the future?**  
Future with and without humans. **(Environmental Crises)**

**Weekly e-Format:** (each week this e-course will follow a similar format)

**Guidelines** (2-3 pages of introduction to the week's topic)

**Cartoon & Quote** (light perspective on weekly topic to set the tone)

**Required Reading** (2-3 uploaded articles and a chapter from *Biology, Science for Life* textbook)

**Reading Report** (must write a précis as a deliverable each week – read and marked by course instructor. 9 reports total @ 5 = 45 points)

**Further Reading – Optional** (for interested students that want to explore further)

**Forum Topic** (Weekly discussion board where all students must participate: a controversial or thought-provoking question that requires preparation/exploration. Starts in Week 2. Monitored by instructor. 8 forums @ 5 points = 40)

**Class Task for Forum next week** (Reading assignment or task to prepare for next week's forum)

**Watch podcast or Go to URL** (current NPR-type podcast or website for information or discussion)

**Catch-Up** (Background biological information for students on this week's topic, ex. Cell division, genome, viruses)

**Final Paper** (Deliverable in Week 9. Topic: "How did this course affect my view of man's role in nature?" 15% of total grade)

**Course content:** This course is delivered via Blackboard, your online learning community, where you will interact with your classmates and with me, your instructor. Within the course Blackboard site you will access the learning materials, tutorials, and syllabus; discuss issues; submit assignments; take quizzes; email other students and the instructor; participate in online activities; and display your projects. To preview how an online course works, visit the [Ecampus Course Demo](#). For technical assistance, Blackboard and otherwise, see <http://ecampus.oregonstate.edu/services/technical-help.htm>

**Evaluation of student performance:** This course is evaluated on three criteria: timely submission of the weekly written reading report, submission of one final short term paper and on the level of participation in weekly forums. There are no proctored exams.

**Statement Regarding Students with Disabilities:** Accommodations are collaborative efforts between students, faculty and [Services for Students with Disabilities \(SSD\)](#). Students with accommodations approved through SSD are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through SSD should contact SSD immediately at 541-737-4098.

**Expectations for Student Conduct:** Student conduct is governed by the university's policies, as explained in the [Office of Student Conduct: information and regulations](#). In an academic community, students and faculty, and staff each have responsibility for maintaining an appropriate learning environment, whether online or in the classroom. Students, faculty, and staff have the responsibility to treat each other with understanding, dignity and respect. Disruption of teaching, administration, research, and other institutional activities is prohibited by [Oregon Administrative Rule 576-015-0015 \(1\) and \(2\)](#) and is subject to sanctions under university policies, [OSU Office of Student Conduct](#).

- **Academic Integrity:** Students are expected to comply with all regulations pertaining to academic honesty, defined as: *An intentional act of deception in which a student seeks to claim credit for the work or effort of another person or uses unauthorized materials or fabricated information in any academic work.* For further information, visit [Avoiding Academic Dishonesty](#), or contact the office of Student Conduct and Mediation at 541-737-3656.
- **Conduct in this online classroom:** Students are expected to conduct themselves in the course (e.g., on discussion boards, email postings) in compliance with the [university's regulations regarding civility](#). Students will be expected to treat all others with the same respect as they would want afforded themselves. Disrespectful behavior to others (such as harassing behavior, personal insults, inappropriate language) or disruptive behaviors in the course (such as persistent and unreasonable demands for time and attention both in

and out of the classroom) is unacceptable and can result in sanctions as defined by Oregon Administrative Rules [Division 015 Student Conduct Regulations](#).

## **Communications:**

### **Ground Rules for Online Communication & Participation:**

- *Online threaded discussions* are public messages, and all writings in this area will be viewable by the entire class or assigned group members. If you prefer that only the instructor sees your communication, send it to me by email, and be sure to identify yourself and the class.
- Posting of personal contact information is discouraged (e.g. telephone numbers, address, personal website address).
- *Online Instructor Response Policy*: I will check email frequently and will respond to course-related questions within 48 hours.
- *Observation of "Netiquette"*: All your online communications need to be composed with fairness, honesty and tact. Spelling and grammar are very important in an online course. What you put into an online course reflects on your level of professionalism. Here are a couple of references that discuss
  - writing online: <http://goto.intwg.com/>
  - netiquette: <http://www.albion.com/netiquette/corerules.html>.
- Please check the Announcements area and the course syllabus before you ask general course "housekeeping" questions (i.e. how do I submit assignment 3?). If you don't see your answer there, then please contact me.

### **Guidelines for a productive and effective online classroom:**

- The discussion board is your space to interact with your colleagues related to current topics or responses to your colleague's statements. It is expected that each student will participate in a mature and respectful fashion.
- Participate actively in the discussions, having completed the readings and thought about the issues.
- Pay close attention to what your classmates write in their online comments. Ask clarifying questions, when appropriate. These questions are meant to probe and shed new light, not to minimize or devalue comments.
- Think through and reread your comments before you post them.
- Assume the best of others in the class and expect the best from them.
- Value the diversity of the class. Recognize and value the experiences, abilities, and knowledge each person brings to class.
- Disagree with ideas, but do not make personal attacks. Do not demean or embarrass others. Do not make sexist, racist, homophobic, or victim-blaming comments at all.
- Be open to be challenged or confronted on your ideas or prejudices.

## **Student Assistance:**

- **Contacting the instructor** — Students are encouraged to e-mail the instructor at any time if they are experiencing problems with the course material. E-mails will be answered within 48 hours. Announcements will also be posted in Blackboard.

Students on the OSU campus may make an appointment to see the instructor if necessary.

- **Technical Assistance** — If the student experiences computer difficulties, needs help downloading a browser or plug-in, assistance logging into the course, or if they experience any errors or problems while in the online course, they should contact the OSU Help Desk for assistance. They can call (541) 737-3474, email [osuhelpdesk@oregonstate.edu](mailto:osuhelpdesk@oregonstate.edu) or visit the [OSU Computer Helpdesk online](#).

**Tutoring:** Writing weekly reports is an important part of this course. OSU offers a range of resources to assist you in becoming a better academic writer. Specifically, you are encouraged to utilize the [OSU Online Writing Lab](#) and/or the online tutoring service available free through [Smarthinking](#); both of these services are valuable resources to improve your writing and adherence to APA style.

**Course Evaluation:** Students are encouraged to participate in the OSU **Student Evaluation of Teaching Form** — Course evaluation results are extremely important and are used to help me improve this course and the learning experience of future students. Results from the 19 multiple choice questions are tabulated anonymously and go directly to instructors and department heads. Student comments on the open-ended questions are compiled and confidentially forwarded to each instructor, per OSU procedures. The online Student Evaluation of Teaching form will be available toward the end of each term, and you will be sent instructions by Ecampus. You will login to “Student Online Services” to respond to the online questionnaire. The results on the form are anonymous and are not tabulated until after grades are posted.