

Salmonid Life History and Behavior: Fall 2021 - Dr. Thomas Quinn

<u>Date</u>	<u>Day</u>	<u>Topic</u>
S-29	Weds	Introduction, goals and course schedule; photos of N. A. salmonids
O-01	Fri	General life history & distribution of <i>Oncorhynchus</i> , <i>Salmo</i> and <i>Salvelinus</i>
O-04	Mon	Life histories and identification, continued
O-06	Weds	Life histories compared with other N. A. fishes
O-08	Fri	Global patterns of anadromy and catadromy; Speciation, glaciation
O-11	Mon	Oceanic migration and orientation
O-13	Weds	Coastal and estuarine migrations
O-15	Fri	Upriver migrations, energetics, hormones
O-18	Mon	Homing - evidence and patterns
O-20	Weds	Homing - mechanisms
O-22	Fri	Selection of spawning site and female reproductive behavior
O-25	Mon	Reproductive success of males
O-27	Weds	Ecology of adult salmon: predators, scavengers and nutrient cycling
O-29	Fri	Egg mortality and incubation schedules, Mid-Term Exam (take-home)
N-01	Mon	Emergence and initial fry movements
N-03	Weds	Salmonids in streams Part I
N-05	Fri	Salmonids in streams, Part II, Proposal objectives due
N-08	Mon	Sockeye fry in lakes: predation and feeding
N-10	Weds	Trout and char in lakes
N-12	Fri	Seaward migration: timing, orientation
N-15	Mon	Estuarine residence and migration
N-17	Weds	Early marine migration and distribution
N-19	Fri	Marine predation and survival, Draft proposals due
N-22	Mon	Marine feeding and growth, Proposal edits due
N-24	Weds	Age and size at maturity, Proposal drafts and edits returned
N-26	Fri	<i>Thanksgiving – no class</i>
N-29	Mon	Population structure and local adaptation
D-01	Weds	Successes and failures of transplants
D-03	Fri	Dams and salmon
D-06	Mon	Effects of forestry on salmonids
D-08	Weds	Wild salmon and hatcheries
D-10	Fri	The future of salmon, Final proposals due, Final Exam (Take-home)

Salmonid Behavior and Life History

OBJECTIVES: The specific objective of the class is to acquaint students with the life cycles of Pacific salmon, trout, and their ecosystems. The broader objective is to give students an opportunity to think critically about a well-studied group of fishes, seeking lessons that pertain to general themes in ecology and behavior. The life cycles of salmon and their relatives are studied from behavioral and ecological perspectives, after first being placed in the context of fish life histories. We then follow the homeward migration of adults from the ocean through coastal waters and up rivers to the stream where they were spawned years earlier. We discuss spawning site selection, reproductive behavior, and the survival during the incubation period. We then consider the behavior and ecology of juvenile salmon in streams, lakes, and during their migration out to the ocean. We consider factors affecting marine survival, growth and the age at maturation. Finally, we address selected topics that are both pertinent to salmon management and serve to integrate the life cycle: the evolution of local adaptations, interactions between land-use practices and salmonids, and the interactions between wild and hatchery-produced salmonids. These topics are presented in a series of pre-recorded, content-rich lectures, with in-class discussion of the topics to ensure full understanding. The course also gives students experience designing and writing a proposal to do scientific research – an exceedingly valuable skill. This assignment involves an initial statement of objectives, a draft, peer editing, and a revision.

REQUIREMENTS:

All students are expected to view the pre-recorded lectures (available on Canvas via Panopto). These lectures, paired with the presentation files (pdf versions of Powerpoint files) present ca. 30 hours of content-rich material, including examples of specific studies and general concepts. These lectures will be augmented with in-class sessions (M-W-F 10:30 – 11:20) to reinforce concepts, pose and discuss questions, draw from the experiences of students, and also to provide the information needed to complete the major assignments of the class (exams and proposal). These lectures and discussions will be the basis for a mid-term and final exam (counting 15% and 30%) for this course, both of which will be of the open-book and take-home format, with short essay questions from material covered in class.

In addition to the exams, students will submit a statement of objectives, draft, and final versions of an original **research proposal** to investigate some aspect of the life history, ecology, or behavior of some salmon or trout species. The quality of these proposals is expected to reflect thoughtful development of research ideas and methods, and writing experience. The proposal should be no less than about 15 double spaced pages, with about 10 or more references to the primary published literature (i.e., journal articles or book chapters), and a budget. The objectives statement will be assessed by the instructor to provide guidance on the scope and direction of the project. The draft will be edited by the instructor and also be edited by a student in the class. The author will have the benefit of both sets of comments in preparing the final version. The draft will constitute 15% of the course grade, the final version will be 30%, and the peer-edits will constitute 10%.