

# **Bamfield Marine Sciences Centre:      Biology of Marine Fishes**

## **May 2005**

Lecturer: Dr. T. E. Reimchen  
TA: Mark Spoljaric

**Overview-** combined lecture and field course focusing on the ecology, behavior, evolution, and conservation of fishes in the North Pacific. Lectures will develop dominant themes with emphasis on current topics/issues in Ichthyology. Field trips supplemented with labs will include identification of intertidal and sub-tidal species of algae, fishes as well as marine invertebrates. Students will be responsible for a research project of their own choice on a topic linked to marine fishes and approved by the instructors. On completion, the students will be expected to have a thorough ecosystem-level understanding of intertidal and sub-tidal ecology.

### **Generalized outline of lecture/discussion topics**

General anatomy, morphological diversity and evolutionary trends  
Swimming hydrodynamics  
Sensory physiology of fishes  
Marine fish communities  
Local and global trends in fisheries  
Critical reviews and discussion of recent papers  
    Behavioral ecology  
    The ecology of differentiation and speciation  
    Coral reef communities-specialization versus the lottery

### **Text Book** (useful but not mandatory)

The diversity of fishes. Authors: Helfman, Collette and Facey, 1997. Cost- ca. 120\$.

### **Field Guide** (useful but not mandatory):

Pacific Coast Inshore Fishes, Author: Gotshall 1989.

Students are expected to browse current periodicals – examples- Trends in Ecology and Evolution, Science, Nature, Evolution, etc. for topics discussed in lectures

**Labs:** Labs will examine external and internal anatomy of fishes, identification and functional morphology of marine fishes of British Columbia and fishes from selected Orders not encountered in coastal British Columbia. Applications and techniques of stable isotope analyses will be examined.

### **Field Trips:**

Intertidal ecology overview. macrophytes, invertebrates and fish on intertidal shores, tidal cycle, exposure and zonation.

**Project:** Students (in pairs) will undertake a field and lab-based project directed at developing 1) design of field experimental protocols, collection and analyses of data 2) gain new insight into some aspect of marine fish biology and 3) scientific writing. Formal reports must follow format from research journals (eg. Canadian Journal of Zoology).  
**Completed draft by June 3<sup>rd</sup> (0900 hrs) at the latest.**

**Grades Lectures(40%)**

Class presentations and discussions-10%

Final Lecture Exam 30%

**Laboratory (60%)**

Mid-term-intertidal species identification- 15%

Project-45%

**Timeline**

May 2-6: Preliminary proposal (1 page)

May 8: Formal proposal (Plan A, Plan B)(3 pages)

May9-May29: Data collection

May30-June3: Analyses and writeup

June 3 (1600 hrs) - Hand in completed first draft

June 5-9- Revision and oral presentation

June 3(0900) – Hand in final draft

**Examples of possible projects**

- 1) Schooling in larval fish and predation threat
- 2) Nocturnal and diurnal behaviour activity trends
- 3) Microhabitat substrate preferences of colour morphs (i.e. gunnels, prickleback, sculpins, clingfish)
- 4) Mutualism between selected invertebrates and intertidal fishes (i.e.ghost shrimp burrows and arrow gobies).
- 5) Behavioral asymmetries and predator detection
- 6) Hydrodynamic adaptations in the intertidal
- 7) Physiological adaptations of intertidal fishes during low tide
- 8) Variability in courtship behaviors (i.e. surf perch, tube-snouts)
- 9) Functional hue and pattern variation using digital images of intertidal fishes

.....or others with approval of instructors