

## WFB 232 Ichthyology - general review outline

The final exam will focus on material covered in the last third of the semester; however, I will also ask some general questions about taxonomy of fishes:

What are the major taxonomic classifications of fishes; how many classes, orders, species of fishes are there?

Name an order that has certain characteristics (light production? Deep-sea species? Conserved morphology?)

Give common name, or identifying characteristics, of a few orders among a set of choices

Know which orders are older vs more recent, and the primitive vs. advanced characteristics

Review the two orders that you were assigned

I will also ask a small number of questions that involve topics covered earlier in the semester – anatomy, physiology (buoyancy, osmoregulation, respiration) and sensory systems (vision, hearing, olfaction, acoustic-lateralis system). In particular, go over internal anatomy (recalling the dissection done during class just before the second midterm).

### Reproduction, development

anatomy of reproductive system

timing and location of spawning

reproductive effort - fecundity, onset of reproduction, frequency of reproduction

types of reproduction and investment in reproduction (non-guarders, guardians, live-bearers; male vs female parental care)

developmental stages (egg, larvae, juvenile, adult)

reproductive strategies

parthenogenesis

hermaphroditism - simultaneous and sequential

male alternate strategies – basses (satellite males, SF males), salmon (jacks)

### Genetics

Hybridogenesis – how does it work?

polyploids (natural and artificial); triploids and sterility – why are triploids sterile? What taxa have natural polyploids? How does polyploidy occur?

### Behavior

orientation to environment

taxes: photo, geo, chemo, thigmo, rheo, electro, magneto

difference between taxis and kinesis

migrations – motivations for different types

for feeding, breeding, overwintering

daily, seasonal, lifetime; vertical vs. horizontal

diadromy - anadromy, catadromy, amphidromy

potamodromy

oceanodromy

Intraspecific behaviors:

schooling – difference between aggregations, shoals, schools

motivation for schooling - feeding, spawning, predator protection, migration

- feeding - types; optimal foraging
- social behaviors and cooperative behaviors
- interspecific behaviors – what taxa are involved, who benefits?
- feeding aggregations, reproduction, shelter
- mutualistic, commensal, and parasitic relationships
- cleaning behaviors

### **Habitats**

- Terminology of the different portions of marine and freshwater habitats
  - coastal, continental shelf, pelagic (epi, meso, bathypelagic)
  - benthic, demersal, littoral, pelagic
  - lentic vs lotic
- challenges presented by different aquatic habitats
- different uses of each habitat (ontogenetic, daily, seasonal)

### **Zoogeography**

- what affects distribution of fishes - freshwater and marine
- plate tectonics
- drainage basins
- glaciation
- temperature and salinity barriers
- zoogeographic regions