

## Sample Essay Questions for BIOL 404 Ichthyology

### Exam #3 – Behavior, Zoogeography, Ecology & Conservation

- 1) Explain what a fixed action pattern is and why it is important to male three-spined sticklebacks and cuckoo catfish.
- 2) What behaviors are involved in fish migrations? What are two advantages and two disadvantages to these migrations?
- 3) Describe four (4) functions of schooling behavior.
- 4) Describe how a shoal differs from a school.
- 5) How do feeding behaviors of fish fit the patterns predicted by optimal foraging theory? Provide an example.
- 6) Why do fish exhibit aggressive behaviors? Provide three (3) specific examples.
- 7) Briefly describe four (4) different types of signals used by fish for communication.
- 8) Describe five (5) color signals/patterns commonly used by fish to advertise, hide, disguise, or otherwise do something important.
- 9) Describe in general terms how global, regional, and local forces together shape a system's fish community.
- 10) Explain the four (4) barriers to marine fish dispersal.
- 11) Describe the three (3) zoogeographic groupings of marine fishes.
- 12) How do pelagic piscivores "divide up" the Pacific Ocean? Explain the four (4) major zones and provide examples of fishes in each zone.
- 13) Explain the current distributions of lungfishes and centrarchids by highlighting important events in continental drift.
- 14) Why is the Mississippi River drainage fish fauna so diverse?
- 15) Why is fish diversity so low in the North American Great Lakes? Provide four (4) reasons.
- 16) Distinguish among endemic, immigrant, and introduced (both intentional and accidental) species in the Great Lakes. Provide an example of each type.
- 17) What series of "filters" will Lake Winona's fish community (today's observed community) have passed through to get to where it is today?
- 18) Provide three (3) examples of how a fish has evolved to become both a better predator and a more elusive prey.
- 19) How are behavioral and morphological changes used by fishes to reduce competition? Provide two (2) examples.
- 20) Compare and contrast mutualism and commensalism in fishes. Provide an example of each.
- 21) Explain the general relationships among fish size, habitat, and parasites (numbers and types).
- 22) Describe four (4) characteristics of regions which are correlated with a higher likelihood of the regions having endangered fishes.

- 23) Explain what led to the collapse of commercial cod fishing on the Grand Banks in the Atlantic Ocean. A graph explaining fish populations, recruitment (production), and overharvest would be helpful.
- 24) Why have cod populations on the Grand Banks failed to recover despite closed fishing seasons?
- 25) Describe four (4) alien species threats to native fish communities. Provide examples of each.
- 26) What is biotic homogenization and what has been the effect of it on fish communities in Minnesota lakes and systems worldwide? Include important fish species in your explanations.
- 27) What are some positives and negatives regarding Atlantic salmon aquaculture?

## Terminology

Innate behavior

Fixed action pattern

Learning

Habituation

Imprinting

Conditioning (classical, operant)

Generational migrations

Shoal

School

Pod

Optomotor reaction

Disruptive coloration

Countershading

Polychromatism

Freshwater vs. saltwater dispersants

Differential exploitation

Symbiosis

Mutualism

Commensalism

Parasitism

Unsustainable harvest

Bycatch