

Things to know for the first Fish Management lecture exam

The first exam will cover lecture material up to and including the 11 October lecture and lab. This includes all readings from Fisheries Techniques and the online readings. There will not be any quantitative problems (i.e., no calculations or formulae to memorize), but you should understand how to interpret data, how to draw figures from class, and key components of the equations we discussed.

- 1) Understand the principles of fisheries management (definition, why we need it, why it fails)
- 2) Know the 8-steps of the fisheries management process and what happens at each step. Know them by name and what each involves (this is from lecture – your management plan combines some of the steps and the “Process” reading has fewer steps).
- 3) Review sample planning and design (key steps, things not to forget, do’s and don’ts)
- 4) Understand the basic differences among sampling gears (active vs. passive, biases)
- 5) Think about sources of bias and error in sampling, and how you can reduce these problems
- 6) Be able to design a suitable sampling protocol given a question or situation
- 7) Tagging
 - a. Understand the benefits and drawbacks of different fish marking techniques
 - b. Know what makes an ideal tag
 - c. Know the main differences among different mark-recapture programs (e.g., which require individual tags, which can be used on open populations)
 - d. Be able to design a tagging program (what tag, how and when will you mark, how and when will your recapture, what mark-recapture model might you use?)
- 8) Assessment
 - a. Know the different types of sampling (random, stratified, etc.)
 - b. Know the different ways to assess population size (relative, index, tagging, etc.)
- 9) Understand the basic fisheries metrics we discussed
 - a. Individual – length and weight, condition factors, growth index, etc.
 - b. Population – length frequency histograms, PSD and RSD, tic-tac-toe, mortality, etc.
 - c. Community – balance (Y:C, F:C), bottom-up and top-down, trophic models
- 10) Population dynamics and modeling
 - a. Know what density dependent, density independent, compensatory, and depensatory responses are, examples of each, and how to identify when they might be occurring
 - b. Be able to draw and interpret graphs of 1) stock vs. recruits per adult, 2) stock vs. recruits, and 3) stock vs. yield
 - c. Know the basic progression in population models and what makes them different (e.g., the contributions of Verhulst, Malthus, Allee, etc.)
 - d. Know the difference between Ricker and Beverton-Holt models for stock-recruitment. Why are they shaped differently?
 - e. You should understand the equations and variables well enough to tell me what type of equation it is (e.g., exponential growth, includes carrying capacity, etc.)
 - f. Know how to cobweb stock-recruit curves and how to identify if a point is stable
 - g. Understand the basic differences between simple population dynamic models including knowing how to explain, interpret, and graph or diagram them (e.g., production models, stage-structured models)
- 11) Understand the steps and process of the Lake Mendota project (discussed in class)