

Animal Behavior: Study guide for mid-term # 2

For the second exam you should be familiar and understand the material covered in lectures 8 -15, along with the assigned readings in your text (Krebs, Davies & West - Chapters 2 – 10).

You should be familiar with the two sets of papers (group territoriality and handicaps/female choice) that we discussed in class and the ideas they generated in the context of lecture and reading materials. They can be a good source of examples to support your arguments.

In terms of specific concepts introduced during lecture, be sure to be comfortable with the following subjects:

Quantitative approaches to the study of animal behavior.

Advantages and disadvantages of using modeling approaches in the study of animal behavior.

The main types of quantitative models used in behavioral ecology

When they are most aptly used.

How to deal with attempts to measure Overall Lifetime Inclusive Fitness (OLIF)... Understanding proxies for fitness as “currencies” to be evaluated in a cost/benefit analysis.

Also: how to solve....

Optimality models: When are optimality approaches appropriate and how do you solve them?

Discrete models:

example from lecture: Specialist vs Generalist optimal foraging

Continuous models:

example from lecture: Marginal Value Theory of patch residency.

graphical solutions for variable patch qualities and travel times.

Game theory: What is an ESS and how do you solve ESS problems?

What are the 4 basic types of ESS that are possible when you have a 2 x 2 symmetrical game?

Know how to calculate the ESS frequency of behaviors for a 2 x 2 symmetrical games whether it is mixed or pure (check out the sample questions on the exam page of the web site).

Animal Dispersion

The link between dispersion and social organization Movements: What is a kinesis and how does it differ from a taxis. Give examples and be able to explain how either could produce aggregations.

Basic patterns of dispersion in nature (random, grouped, and spread out)... which is least common?

Grouping (especially aggregations for getting food or avoiding being food).

Know the basic difference between active and passive grouping models

Passive models of group formation

Ideal free models for acquiring resources

4 assumptions

2 predictions

Selfish herd models for avoiding predation

What determines the size of groups?

Optimal vs stable group sizes.

Active models of group formation

1) Getting food (5 hypotheses & examples)

2) Avoiding being food (4 hypotheses & examples)

Encounter rates and consumption rates

Other examples of active grouping:

huddling to save body heat

schooling or flocking to reduce drag

Spreading out

Defining territoriality and economic defensibility

The benefits of territoriality and how they relate to territory size

The cost of territoriality and how they relate to territory size

Sources of defense costs

The role of “intruder pressure”: how is it defined mathematically

Spread out groups: the costs and benefits of territory sharing with examples, particularly with regard to discussion papers on the topic.

The evolution of sex, anisogamy, and conflicts of interest

The potential costs and benefits associated with sexual vs asexual reproduction from ecological and evolutionary perspectives

Anisogamy and its relevance to the evolution of behavior

The factors limiting reproductive success of males vs. females and the relationship to the evolution of social behavior

Life history: What is it and why is it relevant to the study of animal behavior.

Describing fitness as a function of:

Reproductive benefits

Offspring survival

Pre-natal and Post-natal allocations to offspring

Reproductive costs.

The trade offs among these variables and expected traits associated with:

Semelparity (big bang) reproduction vs Iteroparity

Behavior and “higher order” social organization

Patterns of parental care and parent/offspring conflict

Types of parental care (none, one parent, both parents)

Taxonomic patterns of parental care/investment and why they exist

A game theoretical approach to “care” vs. “don’t care” strategies (pg 233 in text)

Examples of parental care with variable parental care

Mating system evolution

Sex-specific components of fitness related to mating (encounter rate, fertilization success, etc)

Types of mating systems with examples

Taxonomic patterns that link resource dispersion to mating system

The link between parental care and mating system evolution