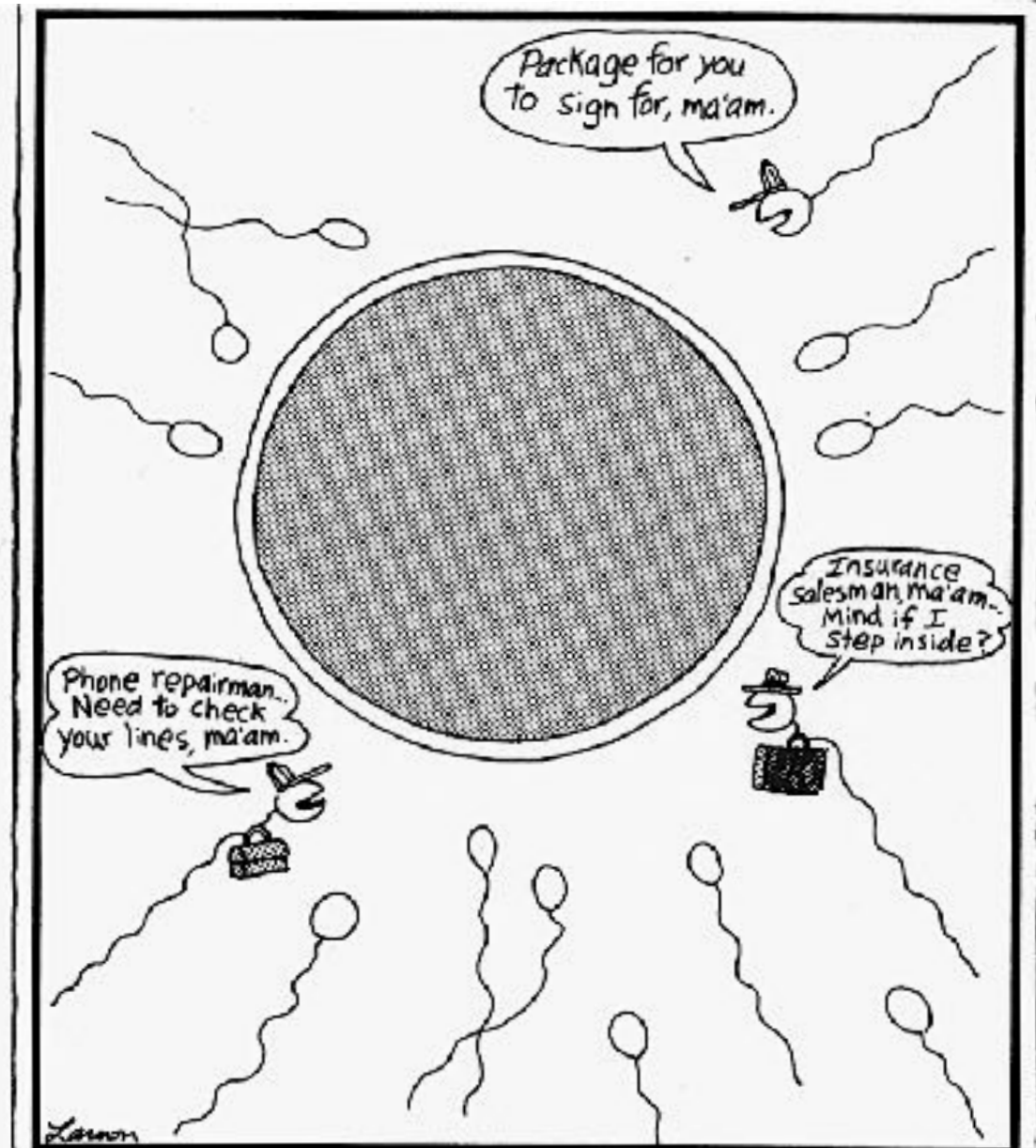


Mating systems, part 2



How the human egg is often deceived.

Polygyny

- Polygyny is the most common mating system
 - What do you expect to see in polygyny?
 - 1) OSR (male-biased/female-biased)
MALE-BIASED
 - 2) SPATIAL DISTRIBUTION (uniform/clumped)
CLUMPED
 - 3) TEMPORAL DISTRIBUTION (asynchronous/synchronous)
MODERATELY ASYNCHRONOUS



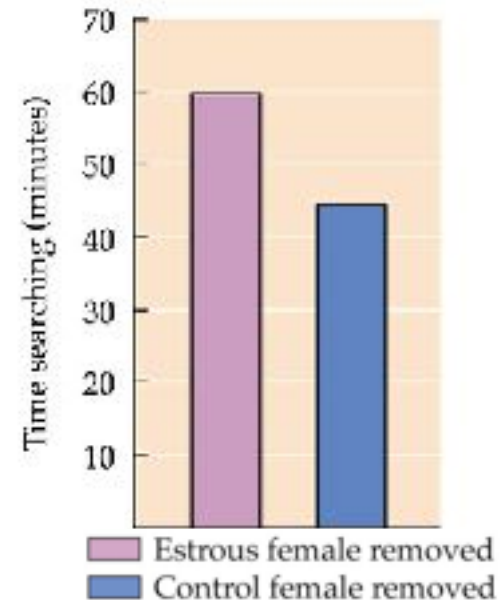
- **Four types of polygyny**
 - Scramble competition
 - Female defense
 - Resource defense
 - Lek

Scramble competition polygyny

- Males search for (sometimes widely dispersed) females and out-race rivals

- Examples

- Ground squirrels
 - females go ashore to lay eggs
- Horseshoe crabs
 - wild one night orgies!!
- Wood frogs
- Garter snake emergence



- What do females get out of this?

- Male of highest quality (fastest, toughest, most stamina) is likely to mate



Female defense polygyny

Males gain access to ♀♀ directly by keeping rivals away

– Huge variation in mating success among males

– Examples

- Red Deer
 - defend mobile harems
- Southern Elephant Seals
 - defend females on beach (not beach)
- Greater spear-nosed bat
 - Defends as many as 50 females wherever they roost

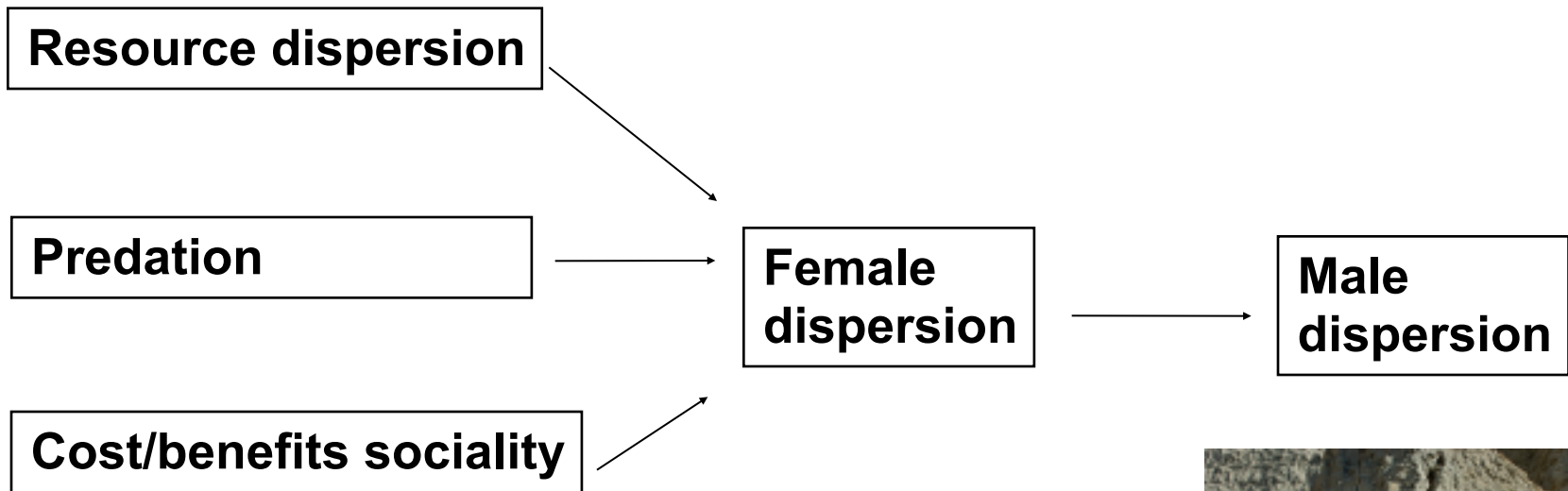


Female defense polygyny

- Why do females stick together?
 - Benefits of grouping outweigh breeding solitarily
 - Various group benefits (reduce predation, increase foraging success, etc.)
 - » ex. Lionesses benefit through protection from infanticidal males



Female/resource defense polygyny and female dispersion



Female defense polygyny

Resource defense polygyny

- Males gain access to females indirectly by monopolizing access to resources that are valuable to females



– Examples

- Water striders guard floating leaves (oviposition sites)
- African cichlids guard shells (oviposition sites)
- Antlered flies guard root hairs (oviposition sites)



– What do females get out this?

- Good territory (food, oviposition, protection)



Female/resource defense polygyny and female dispersion

Resource dispersion

**Male
dispersion**

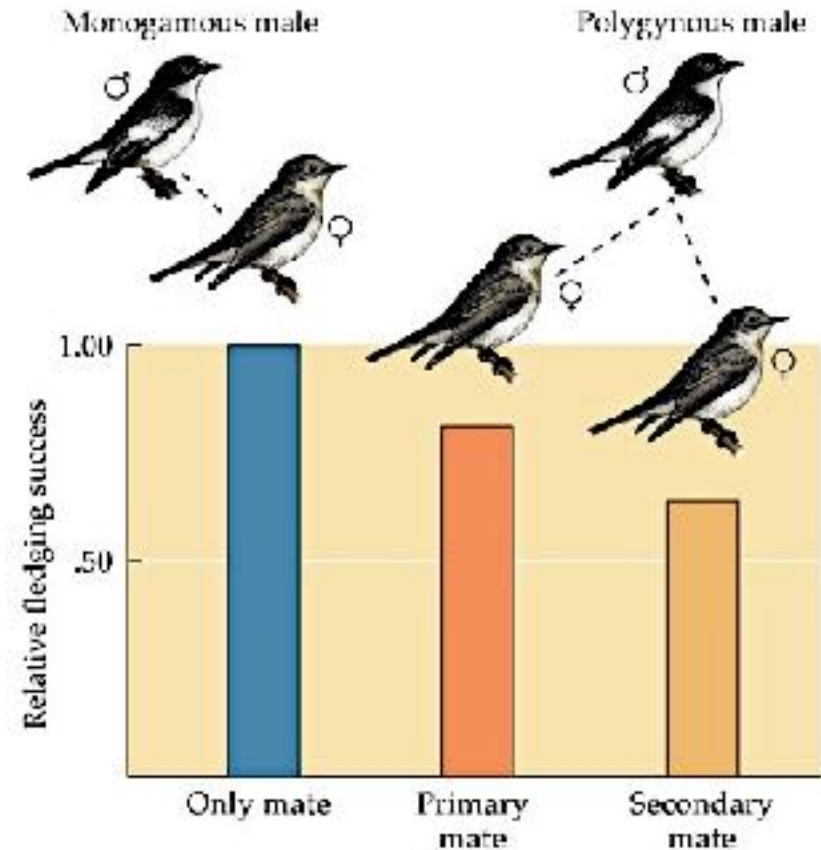
**Female
dispersion**



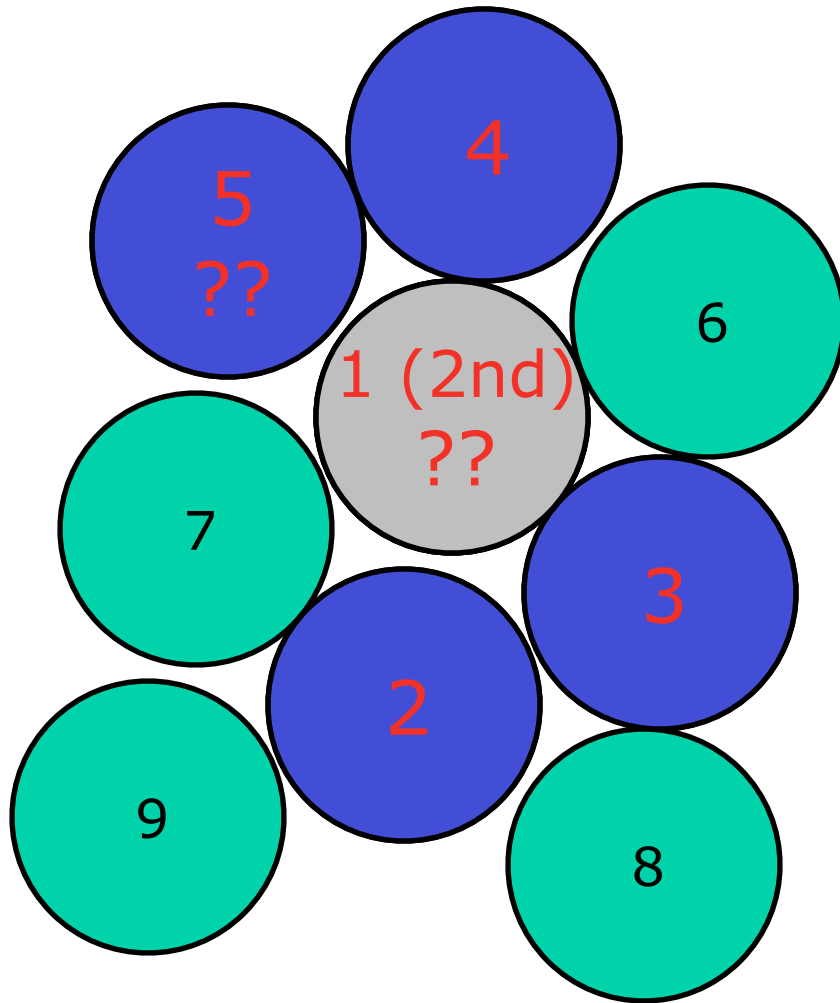
Resource defense
polygyny

Polygyny threshold model

- Is polygyny best for females?
 - Pied flycatchers
 - Females in polygynous relationships often have reduced fitness as a result of sharing the male
 - Why be secondary female when OSR typically male-biased?
 - Benefits depend on variation in:
 - » territory and mate quality



Polygyny threshold model

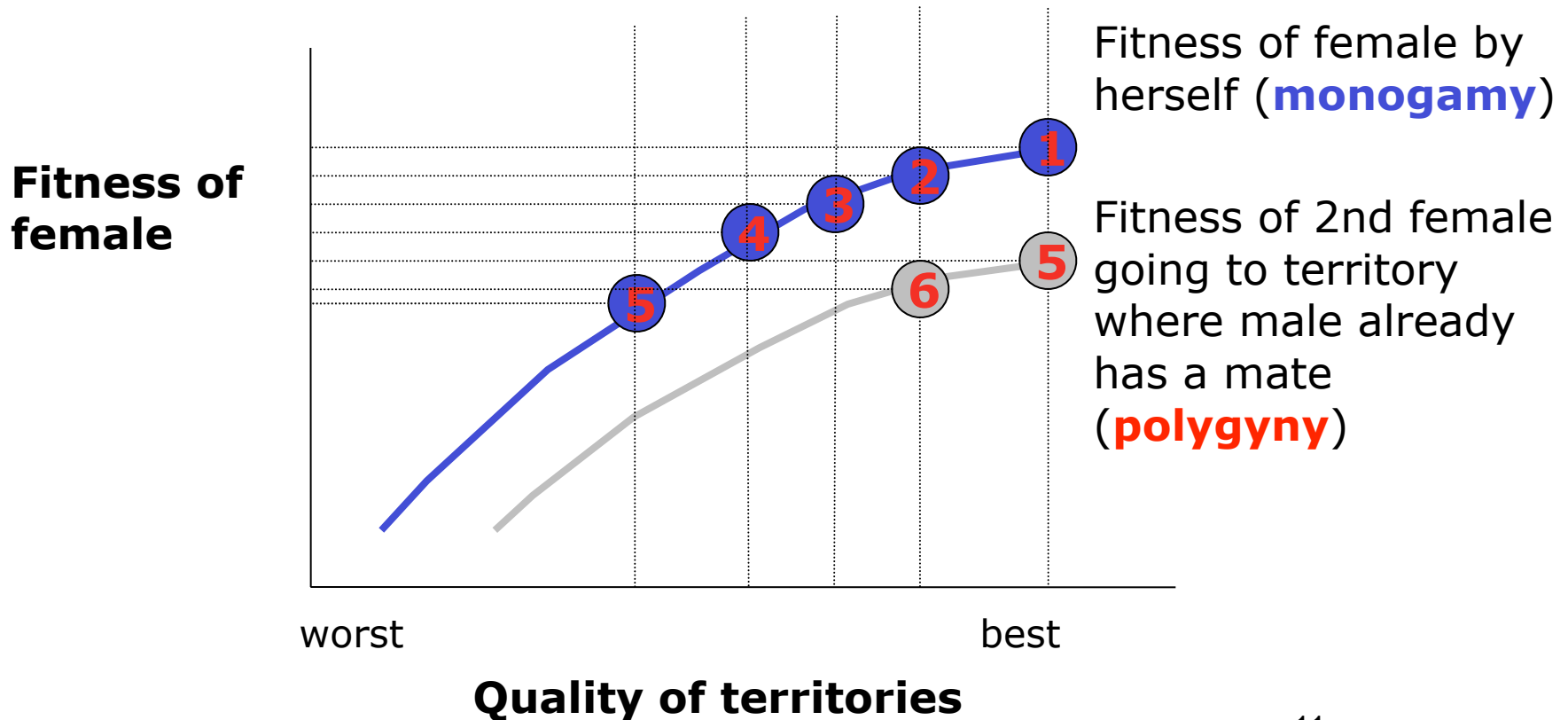


- Males arrive first and settle
- Females arrive sequentially
 - 1st female goes to best territory
 - 2nd goes to next-best territory
- When does it benefit female to join as secondary female
 - weigh bt: male's undivided care versus male/territory quality
- The point where it “pays” to go to an already occupied territory = polygyny threshold

 = monogamous  = polygynous

Polygyny threshold model

- It's all about *individual* decisions
 - Each female decides what is best for her
 - Variation in habitat quality leads to polygyny



Leks

- Lek polygyny
 - An area where males that provide no parental care “strut their stuff” and attract mates, but don’t defend any resources (other than display site).



Leks

- Why are leks so rare?
 - Lack of paternal care is rare in birds
 - Resources are usually monopolizable
 - Question remains: in a system with no direct benefits and widely dispersed females, you usually have scramble competition. Why do leks evolve sometimes?



Leks

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no clear answer







Where leks form

- **1) Hotspots** = Males congregate around areas that females pass through
- **2) Hotshots** = Males congregate around superior individuals

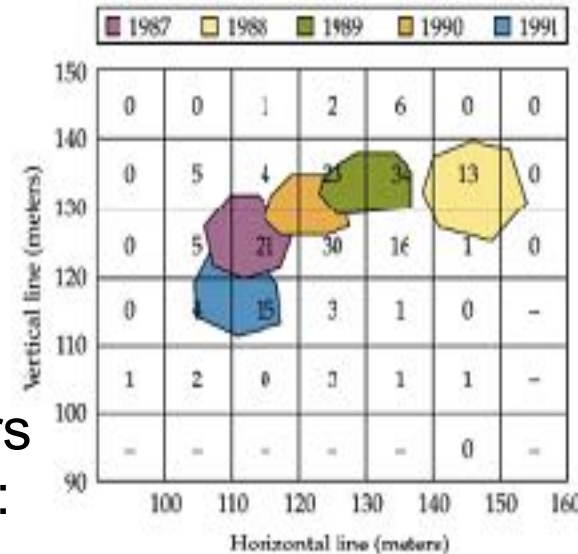


How to differentiate among hotshot/
hotspot?

- 1) Remove alpha male and see if other males move into hotspot

Great Snipe: subordinates move into center of lek after dominant removed (yes: hotspot)

- 2) Monitor if location is stable between years
Black Grouse: location changes yearly (no: hotspot, inferred: hotshot)



Lek Paradox

- Lek Paradox: how is genetic variation maintained?
 - When selection is very strong, only a few individuals will contribute genes to next generation.....



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Is there some way that genetic variation is maintained over time?

Lek Paradox: How is genetic variation maintained

- Hypothesis 1: genic capture (polygenic effects)
 - Sexually selected traits often have differential costs (i.e., they are handicaps), and ability to pay costs depends on overall condition
 - because overall condition is influenced by so many genes, there is a huge ‘target’ where genetic variation can arise (due to mutations)



Lek Paradox: How is genetic variation maintained

- Hypothesis 2: Red Queen
 - Long-term environmental (biotic) shifts may favor different traits over time
 - What is best now may be different in future - due to red queen cycling, **leading to constant benefits to rare genotypes**



Polyandry

- Examples
 - Wattled Jacanas & Phalaropes
 - Females defend territories with male harems
 - Males provide all parental care
 - Females larger in Jacanas, and more colorful in phalaropes



