

What we will cover today

Wildlife Behavior

- 1. Ethology & History**
 - 2. Current topics in Ethology**
 - 3. Dominance, Societies, Hierarchy**
 - 4. Ethogram**
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Why Behavior matters

Identify behavior types

Learn more about biology of wildlife species through behavior

Identify locations with specific behavior types

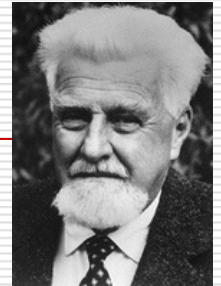
Identify locations with consistent behavior types

Ethology: A Selected Review

Konrad Lorenz: e.g. Geese, aggression

Karl von Frisch: e.g. Bees

Niko Tinbergen: e.g. Supernormal stimuli



Classic topics: Behavioral Genetics (Imprinting), Aggression,
Instincts and Learning, Habituation, Proximate
vs. Ultimate Behavior, Physiology of Behavior,
Rhythms, Courtship, Communication, Orientation,
Animal Awareness

What signifies Behavior



Behavior: Can be defined as the way an organism responds to a stimulus in its environment

e.g.

Body movements

Sequence of movements

Distinct moves

= > needs a classification and quantification system,
the Ethogram

Tinbergen's Four Questions

- Proximate causes
 - What is the cause of the behavior?
 - What stimuli elicit the response
 - What is the physiological mechanism
 - How did the behavior develop within the individual?
 - Is it innate or learned
 - Does the response change with age
 - Ultimate causes
 - What function does the behavior serve?
 - How does it enhance the animal's survival
 - How did the behavior evolve?
 - How is it related to phylogeny (similar species)
-

Behavioral Ecology

Adaptiveness of Behavior

Foraging Behavior

Social Behavior

- Territorial Behavior
- Reproductive Behavior
- Animal Societies



Foraging Behavior

“Feeding” : Intake of a Resource

Foraging Behavior: To maximize resource intake
and minimize energy expenditure (an optimization
process)

Types of Foraging Behavior:

- browsing
- preying
- opportunistic vs. goal oriented

= > Specialists vs. Generalists

Reproductive Behavior

Evolutionary process to assure survival of genes
Can strengthen pair bonding

Parental Investment

Mate Choice

Reproductive Competition

Sexual Selection

Types of Mating Systems and Behavior:

- regular
- promiscuous
- lek sites
- monogamy, polygyny, polyandry



Animal Societies



Society: A group of organisms of the same species that are organized in a cooperative manner.

Group Living: Living as a member of a group is a selfish behavior

Altruism: Self-sacrificing behavior, e.g. Gorillas, Lions, Bears...

Reciprocity

Kin Selection

Helpers

= > Sociobiology: The Biological Basis of Social Behavior
(E.O. Wilson)

Migration Behavior 1.

Migration (birds):

Pre-Migration: Preparation

Migration: Movement

Stop-Over: Resting, Recovery and Preparation

Post-Migration: Recovery

Migration (mammals):

Pre-Migration: Preparation

Migration: Movement

Post-Migration: Recovery

Alarm Behavior

- erecting hair on rump
- erecting tail
- snorting
- fixed staring
- prancing
- call



threat

~~(PS. Who benefits from sending, and who from receiving the alarm ?)~~

Behavior via Postures

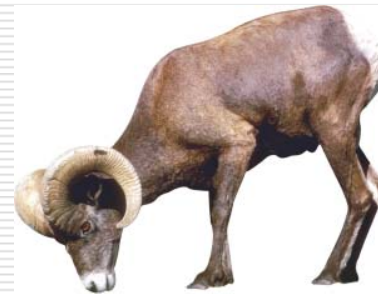
Position of Tail

Position of Head or ears

Antler Display

Rush Threat

Showing Body Size Perpendicular



Behavior and Dominance



Social hierarchy of a population confirmed through behavioral traits:

- increased fitness (offspring and survival)
 - improves bonding between individuals
 - minimizes mortalities, e.g. when antlers are used
 - minimizes predation risks
-

Behavior and Dominance

Social hierarchy is maintained by a variety of postures, threats and aggressive interactions



Behavior and Dominance: Antlers and Horns



Antlers & Horns: Usually just used to move and to push, but not to kill!

They get applied in a highly ritualized display and procedure

"... antler-clashing and shoving matches permit males to evaluate the size and strength of an opponent, but these animals need not even come into contact in order to make these assessments. In fact, the typical clash between males occurs when the two competitors stand off at a considerable distance and roar loudly at each other. Only males in top condition can sustain roaring at a high rate for many minutes because the activity is so costly in terms of energy expended ..." Alcock (2001)

PS. Many Deer present a Threat by exposing Canines

Behavior, Ornaments and Investment

Ornaments as a personal investment

=> Trade-off between loss and benefit, measured in evolutionary success and energy gain



Behavior, Dominance and Spatial Distribution



Animal Spacing depends on Hierarchy, Food Supply and Habitat

-spacing of a herd

-spacing of individuals

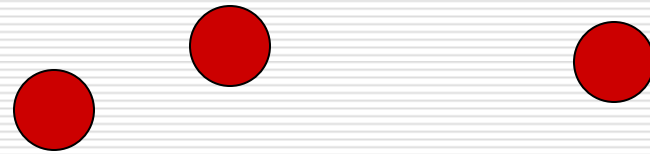
-spacing of specific cohorts

+ strong dynamics in animal cycles, food availability, predators etc.

Behavior and Space 1.

Distribution patterns:

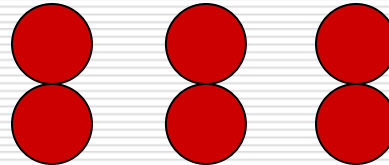
Random



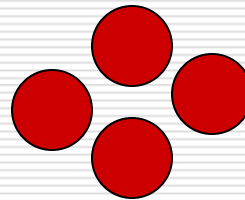
Regular



Systematic



Clumped

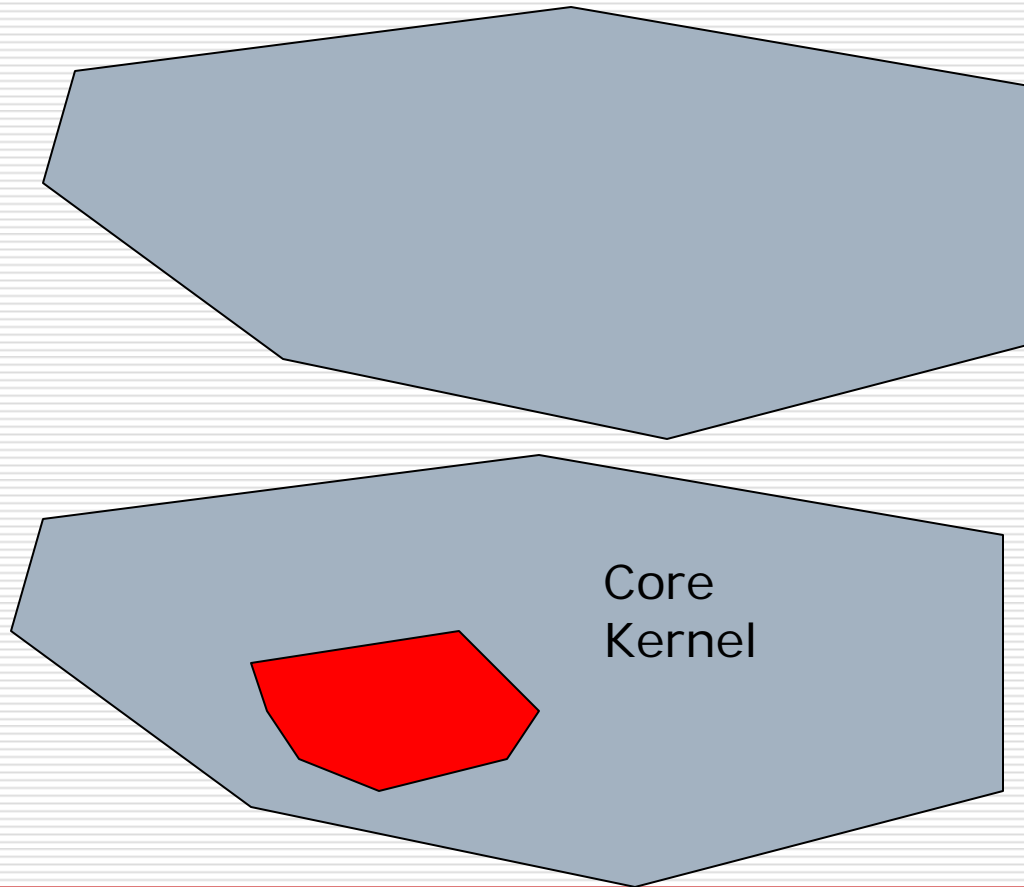


The Selfish Herd

- ❑ WD Hamilton 1971 Geometry of the selfish herd. J. Theor. Biol
 - ❑ Reasons for herding/schooling/flocking are selfish in nature
 - ❑ Individual farthest from nearest neighbor is most likely to be preyed upon
 - ❑ Competition for position within herd—constant reshuffling
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Behavior and Space 2.

Homeranges:
(MCP)



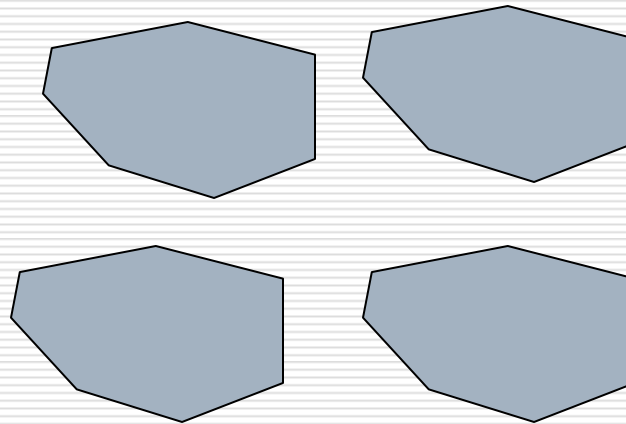
Core
Kernel

Behavior and Space 2.

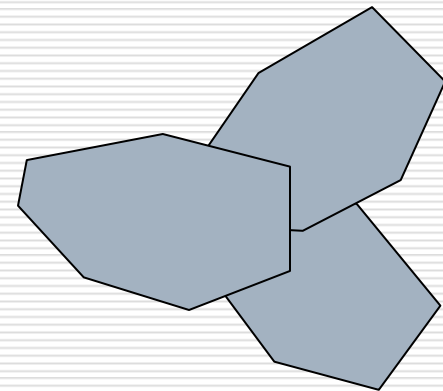
Homeranges:
(MCP)

e.g.

Spatially segregated



Overlaps



Behavior and Space 3.

Dispersal:

by gender

by age

Types of dispersal

Function of dispersal

Scent Glands

Scent marking

Many mammals that engage in scent marking are not territorial.

Scent urination is very common in ungulates
e.g. in Moose: Rutting pits, tree rubbing

Urine contains pheromone which stimulate estrus

Glands: -Subauricular
-Preorbital
-Tarsal
-Interdigital
-Rump
-Caudal

= > importance of the olfactory landscape

Behavioral Life Strategies



Sociality in Ungulates

Gregarious: Caribou, Elk, Bison

(Family) Groups: Mule and Black-tailed Deer, Mountain Sheep

Segregation by Gender: Mountain Goats

Matriarchial Groups: White-tailed Deer

Solitary: Moose

Behavioral Life Strategies: Laziness, Play and Fun



PS. Identification of 'play' ?

Behavior Types and Classifications

'Simple types': Walking
Feeding
Sitting
Sleeping
Digesting
Playing
Mating

Composites: "Foraging"
"Dominance Behavior"
"Individual Defense"
"Group Defense"

How to sample Behavior

= > develop Ethogram

Temporal: -Add lib Sampling

-Interval Sampling

Animal: - Scan Sampling

-Focus Animal

Opportunistic Sampling (e.g. in terms of time and animals)

Famous 'Wildlife' Behavior Studies

Great Apes (Chimpanzees, Gorillas, Orang-Utans, Babboons)

Wolves

African Buffalo

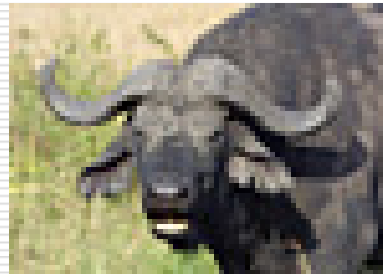
Wapiti

Wild Horses

Ravens

Bumblebee

Sea Mammals



End of Session

Any Questions ?

