



WILDLIFE HABITAT EDUCATION PROGRAM (WHEP)

Lesson 1: Species, Succession,
and Ecoregions



NAMES & NOTES

PRE-WORK REVIEW



WHEP OVERVIEW

State competition: May 18, 2024

- Wildlife Challenge: ID and general knowledge
- Written Management Plan
 - Can use textbook for state challenge only

WHAT IS A SPECIES?

Species: group of organisms that can **interbreed** and produce **viable offspring**



IS IT A SPECIES? WHY?



IS IT A SPECIES? WHY?



+



No offspring

IS IT A SPECIES? WHY?



IS IT A SPECIES? WHY?



+



BEYOND SPECIES

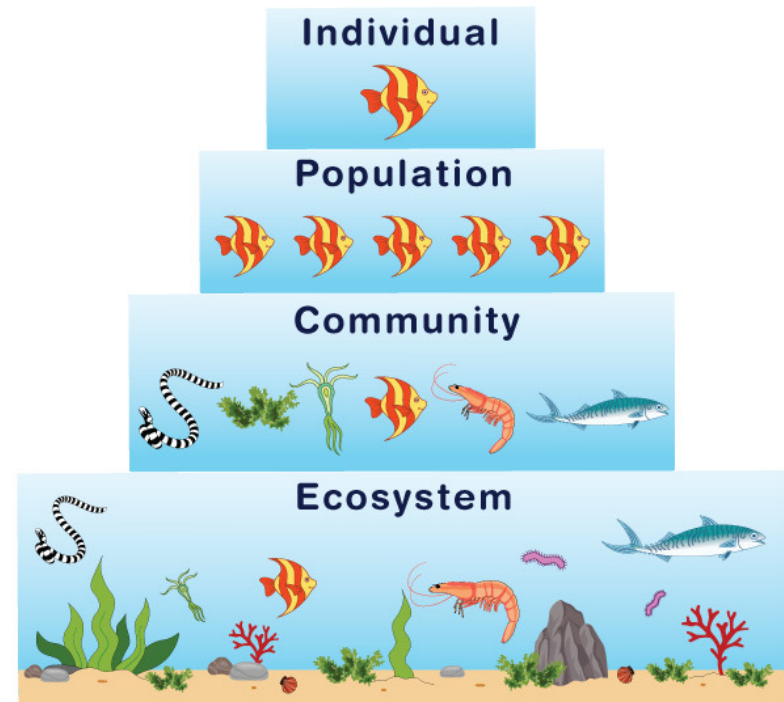
Population: Many individuals of one species that interact

Community: Group of living things of different species that interact

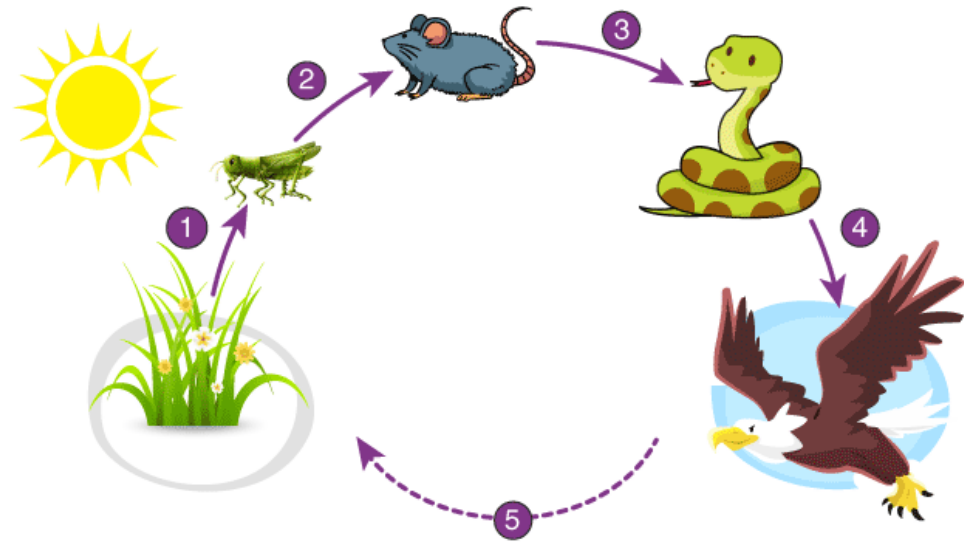
Ecosystem: Living and non-living things interact

Levels of Ecological Organization

ScienceFacts.net



FOOD WEBS



Food Chain

- | | | |
|-----------------------------------|---|----------------------------|
| 1 The grasshopper eats the plants | 2 The mouse eats the grasshopper | 3 The snake eats the mouse |
| 4 The eagle eats the snake | 5 When the eagle dies, fungi break down the body and turn them into nutrients | |



WHAT IS A SUCCESSOR? |

PLANT SUCCESSION

Change in plant community over time

- *What is a community?*

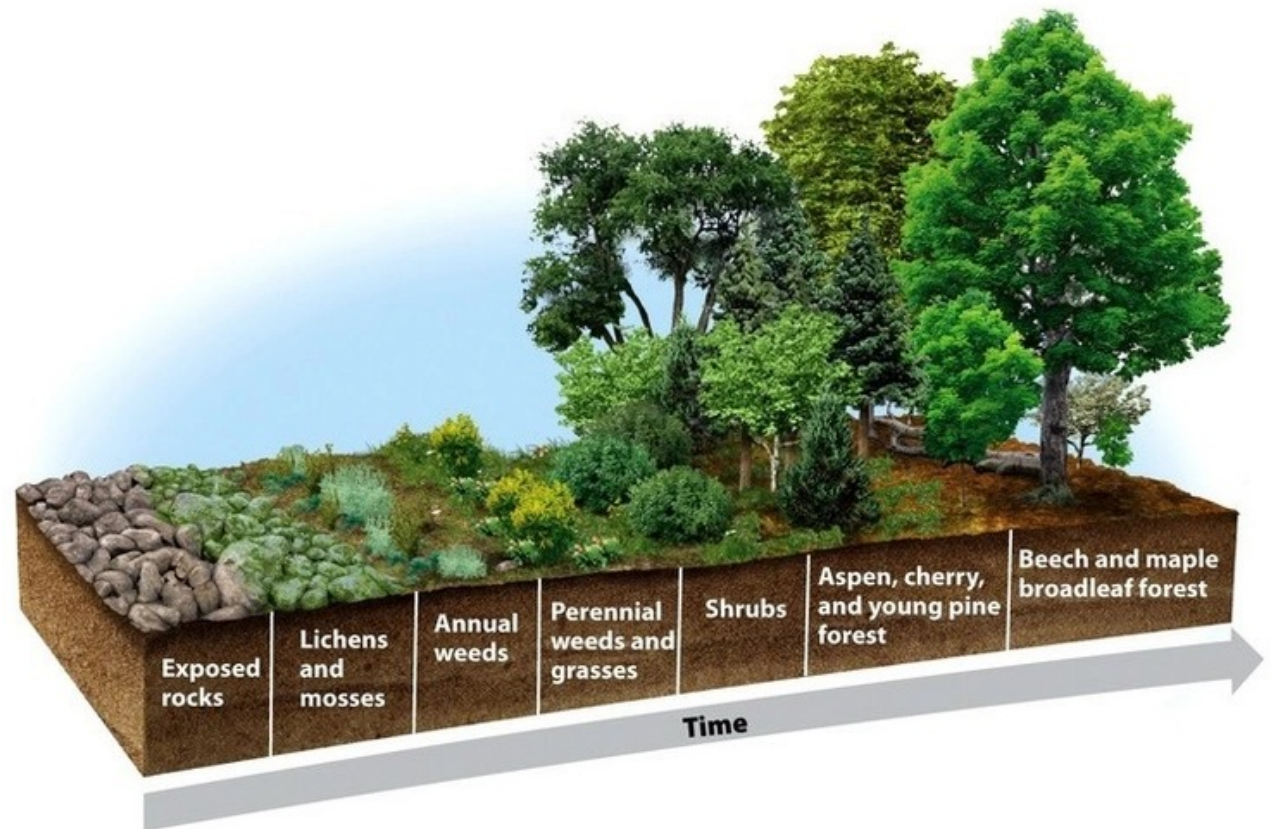
Sere: sequence of plant types that replace one another during succession

- Plant development in an ecoregion is predictable

Succession happens in stages

Influenced by abiotic factors: temperature, soil, climate, fires, disturbance events, etc.

Ecoregion determines what types of plants are in a sere!





HOW WOULD FIRE AFFECT SUCCESSION?

Fire, grazing, ice and wind storms, flooding, etc. set back succession

These are called **disturbance events**

Do humans influence disturbance events?

A blue tractor with a tillage implement is shown in a field at dusk. The tractor is the central focus, with its headlights and various mechanical parts visible. The background is a blurred landscape under a dark sky. The overall tone is somber and industrial.

HOW DO HUMANS AFFECT SUCCESSION?

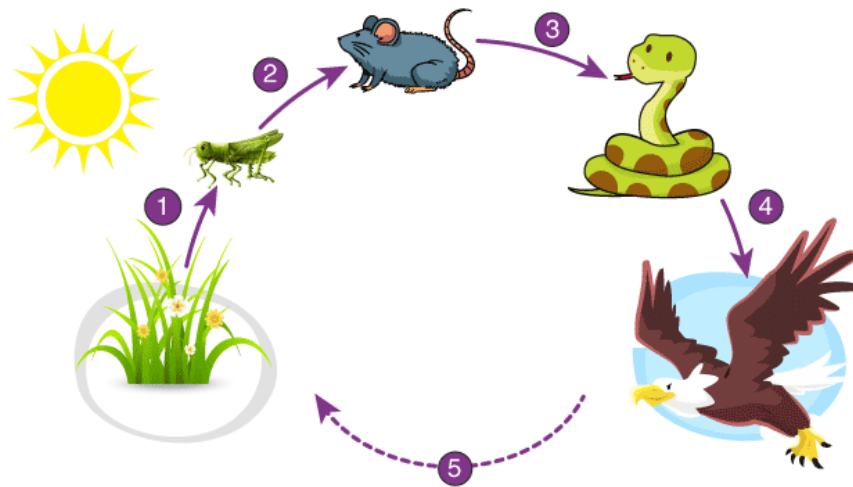
Humans may cause forest fires or prevent spread of fires (firefighters)

Human farmers may cause greater grazing in an area—or, by moving animals to different spot, lessen grazing in an area

Build levees and dams to control natural flooding

Non-native plantings (i.e., farms) prevent succession, causing **arrested succession**

WHY DOES SUCCESSION MATTER?



Food Chain

- 1 The grasshopper eats the plants
- 2 The mouse eats the grasshopper
- 3 The snake eats the mouse
- 4 The eagle eats the snake
- 5 When the eagle dies, fungi break down the body and turn them into nutrients

As plant community and food availability change, what else might change?

Different wildlife species have different **habitat** needs

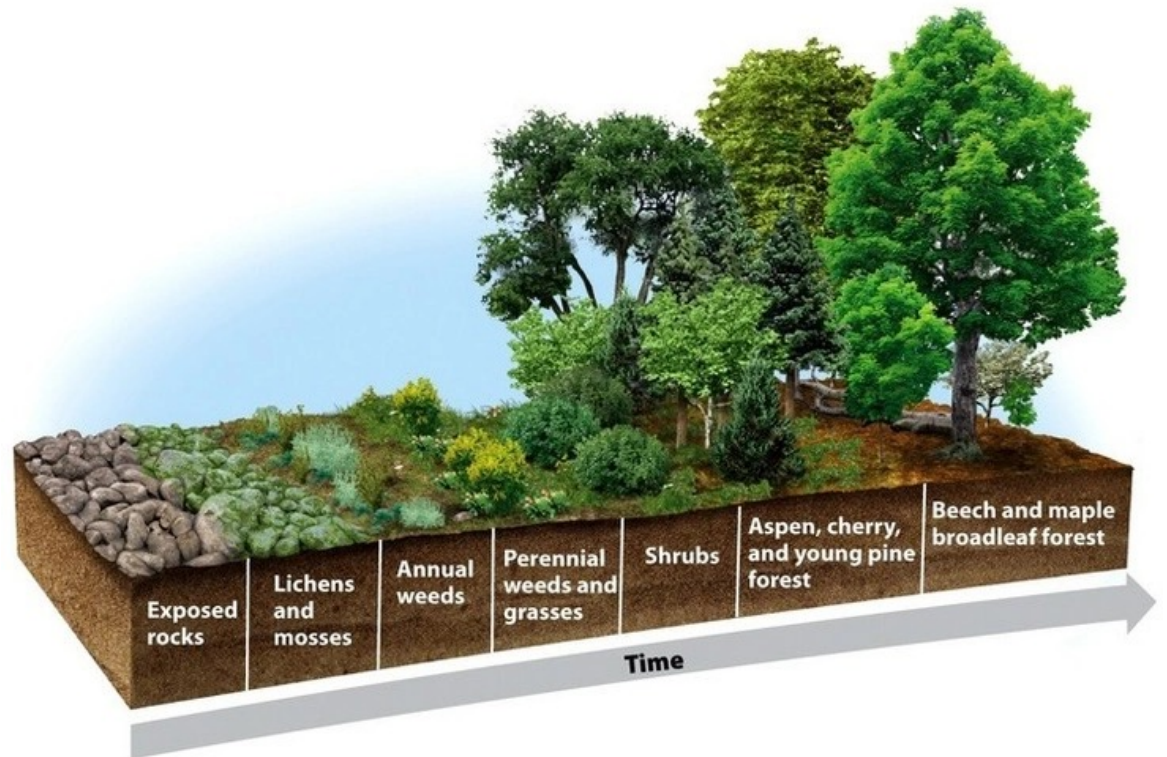
So, succession affects not only plant life but also animal life and distribution!

SUCCESSION AFFECTS HABITAT

Habitat: resources needed by a wildlife species for survival and reproduction

- Resources: food, cover (shelter), water, space
- Reproduction: having offspring

How does the habitat change during succession in the picture?



DO ALL ANIMALS/SPECIES HAVE SAME HABITAT NEEDS?



Example: Will a mouse need more or less food than a moose?

Habitat needs are **species specific**. Not all species require the same resources in the same amount or distribution.

Habitat quality ranges from excellent to poor, depending on how well needs are met. If minimum needs of a species are not met in an area, that area will not provide habitat for that species.

Note: Even though 2 species are found in the same ecoregion, they don't always have similar habitat needs!

(Ex: squirrel & pigeon)

Habitat is not same as ecoregion or vegetation type

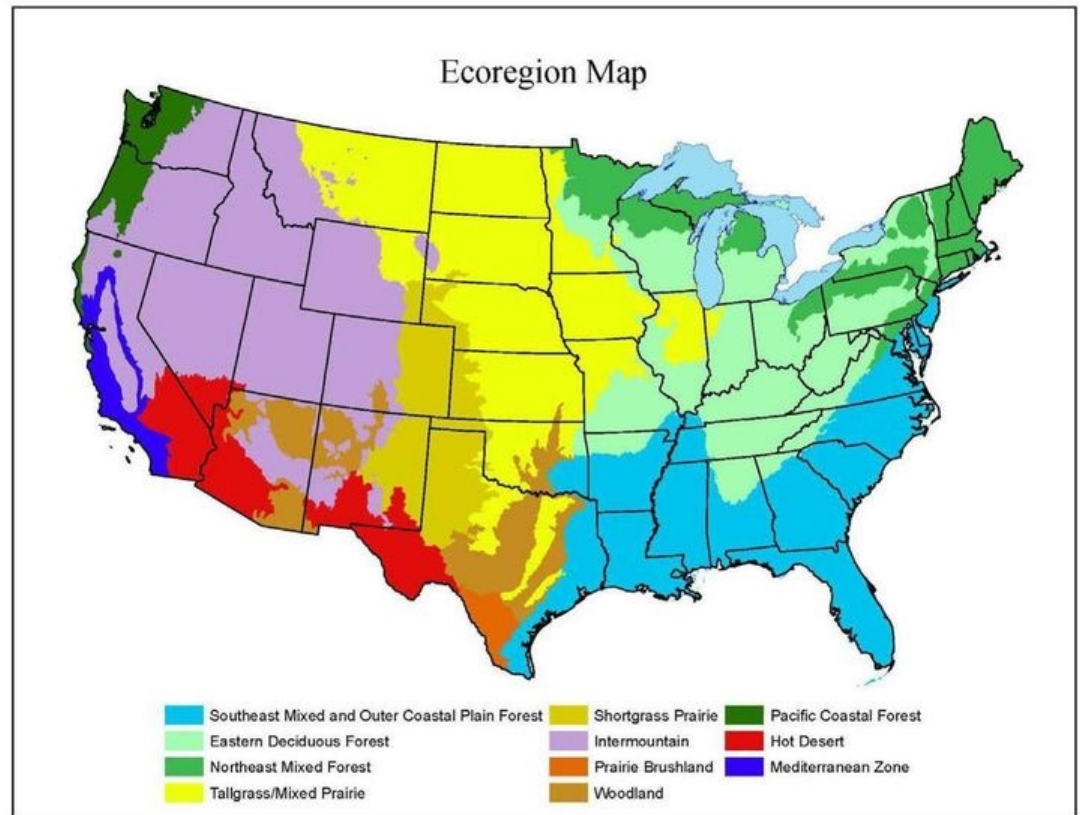
ECOREGIONS

Ecoregions: areas with similar climate, vegetation, and wildlife. Divides land into areas based on the most common ecosystem in that region.

- What ecoregions are found in Iowa?

Ecosystem: the plant community along with the animal community together with soil, air, water, and sunlight

Wetlands & urban areas are found within all ecoregions



TALLGRASS PRAIRIE

Flat to rolling plains with cold winters & hot summers. 20- 40 inches average annual precipitation.

Vegetation: tall grasses & forbs (wildflowers) with few shrubs & trees

Contains large areas of cropland. Many areas grazed by livestock.

Succession Stages:

1. Annual forbs and grasses
2. Perennial grasses and forbs
3. Woody species, such as juniper, osage orange, and elms. Shrubs and trees dominate riparian areas and other sufficiently moist areas that can support woody vegetation.



DECIDUOUS FOREST

Rolling terrain. 35- 90 inches average annual precipitation

Vegetation: deciduous trees

Large areas cleared for crop area & livestock grazing

Succession Stages:

1. Annual forbs such as common ragweed and grasses with a few perennial species
2. Perennial grasses & forbs and brambles
3. Young trees & shrubs
4. Hardwood forest



URBAN ECOREGION

An area with many people

Ecosystems may be fragmented by roads and buildings

Often dominated by nonnative invasive vegetation



WETLANDS

Bodies of water, and the transition areas
between water and land

Aquatic vegetation & trees

Succession Stages:

1. Deep water with little vegetation
2. Shallow water with lots of submerged and floating aquatic vegetation
3. Very shallow water or wet ground dominated by emergent aquatic vegetation
4. Ground becomes drier and dominated by upland vegetation similar to surrounding area



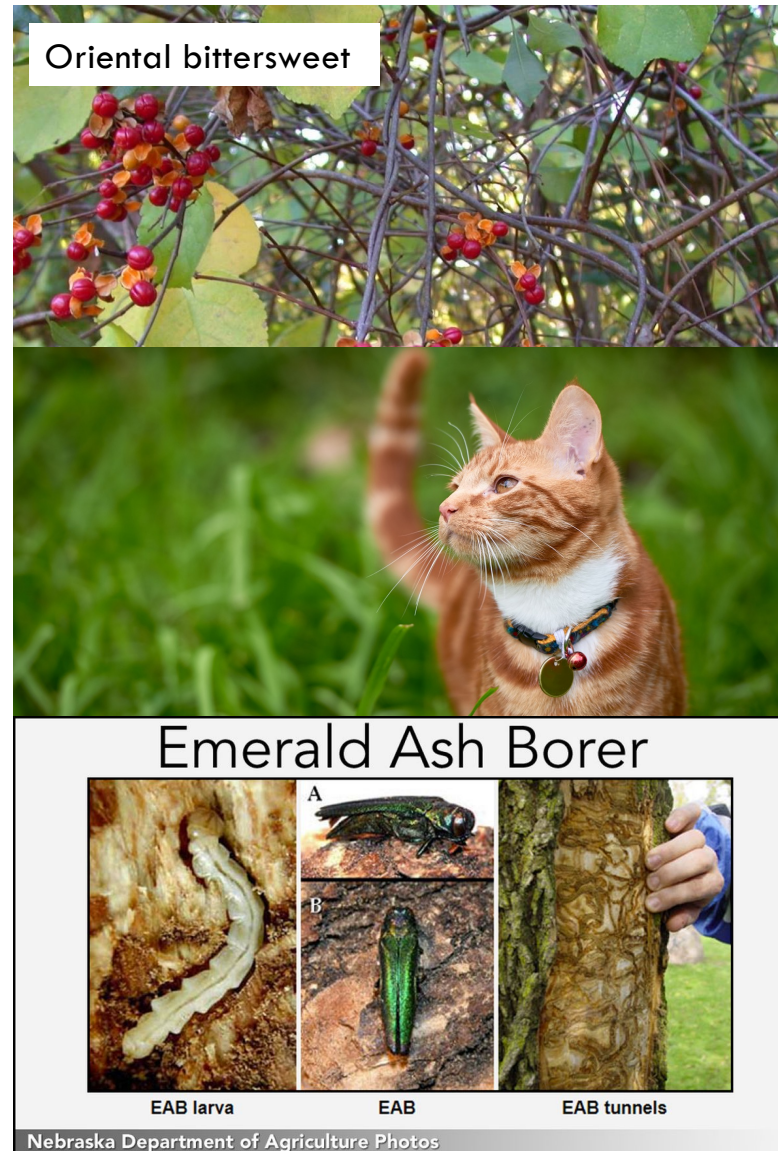
WHAT IS A NONNATIVE INVASIVE SPECIES?

Nonnative: Not from here. Introduced from other area

Invasive: spread very quickly, hard to control

Naturalized: Able to maintain populations in the wild

Are these desirable species? Why or why not?



ARE ALL NONNATIVE SPECIES BAD?

- Cattle & chickens: nonnative, provide agricultural benefit
- Pheasants: managed for
- Red foxes: control prey population

Wheat, soybeans, brown trout are nonnative. Why are they important?

What is the difference between these species and nonnative invasive species?

Nonnative invasives: lessen available habitat for native species, often leading to population decline. Hard to control or eradicate.



MANAGEMENT OVERVIEW

Either focal species approach or ecosystem, management approach

Focal species approach: manage for one or two wildlife species

- Increase cover, food, or water for selected species
- Ex: Dove food plot

Ecosystem approach: manage for a healthy, functioning ecosystem, such as a tallgrass prairie ecosystem, and allow associated wildlife species to respond

Techniques that address the most lacking resource in ecosystem are preferred. Reduces limiting factors.

- What is a limiting factor?

WMPs that benefit one group of species may be detrimental to other

- Ex: Cut down hardwood trees to plant prairie



EDGES

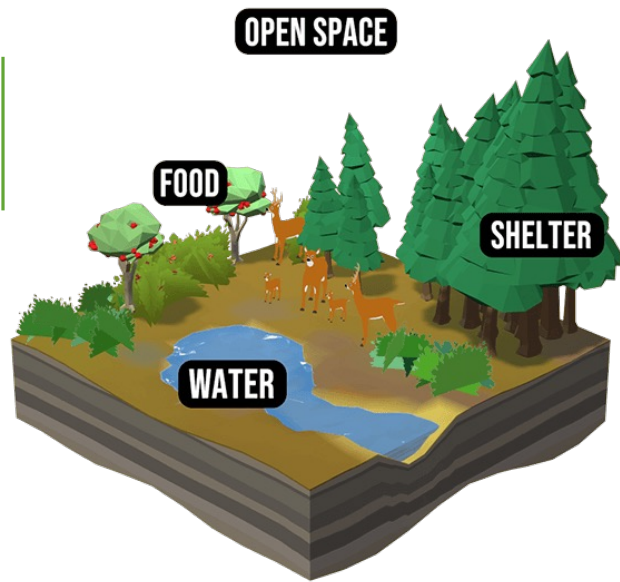
Edge: where 2 or more vegetation types or successional stages meet

- May be sudden (hard edge) or gradual (soft edge)
- Ecotone: Area with characteristics of both vegetation types or successional stages

Increased edge = more vegetation types or successional stages

- May benefit species if both vegetation types are useable and provide habitat requirement or if arrangement suits them.
- May lead to greater biodiversity. *Why?*
- May not benefit species. *Why?*

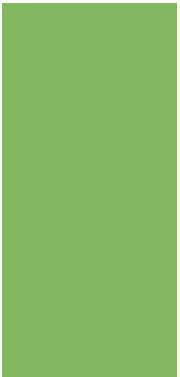




ARRANGEMENT

Horizontal arrangement: How different successional stages or vegetation types are located in relation to each other

- Some species have habitat needs met by only one type of vegetation or successional stages. Others require multiple vegetation types or successional stages.
- For those that need multiple stages or vegetations types, proximity matters. Closer= better. Why?
- Ex: Ruffed grouse



INTERSPERSION

Interspersion: how often different vegetation types occur

Generally, More interspersion = mixing of vegetation types = more wildlife variety

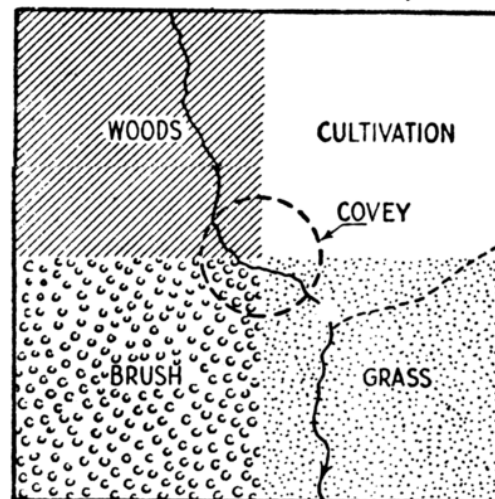
Vegetation types present and quality of food & cover matter more than amount of interspersion

More interspersion = more edge

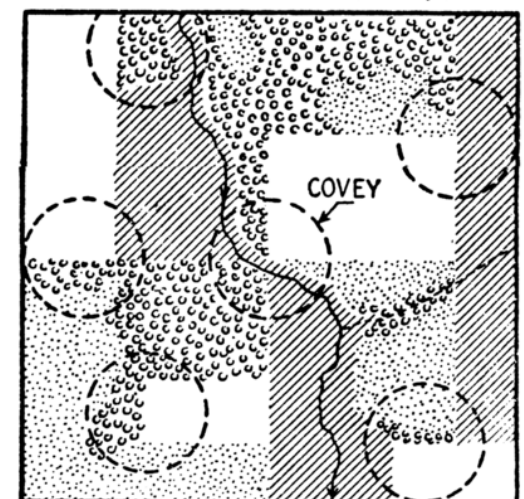
Is edge beneficial? Why or why not?

Is interspersion beneficial? Why or why not?

A: Poor Interspersion (1 Covey)



B: Good Interspersion (6 Coveys)

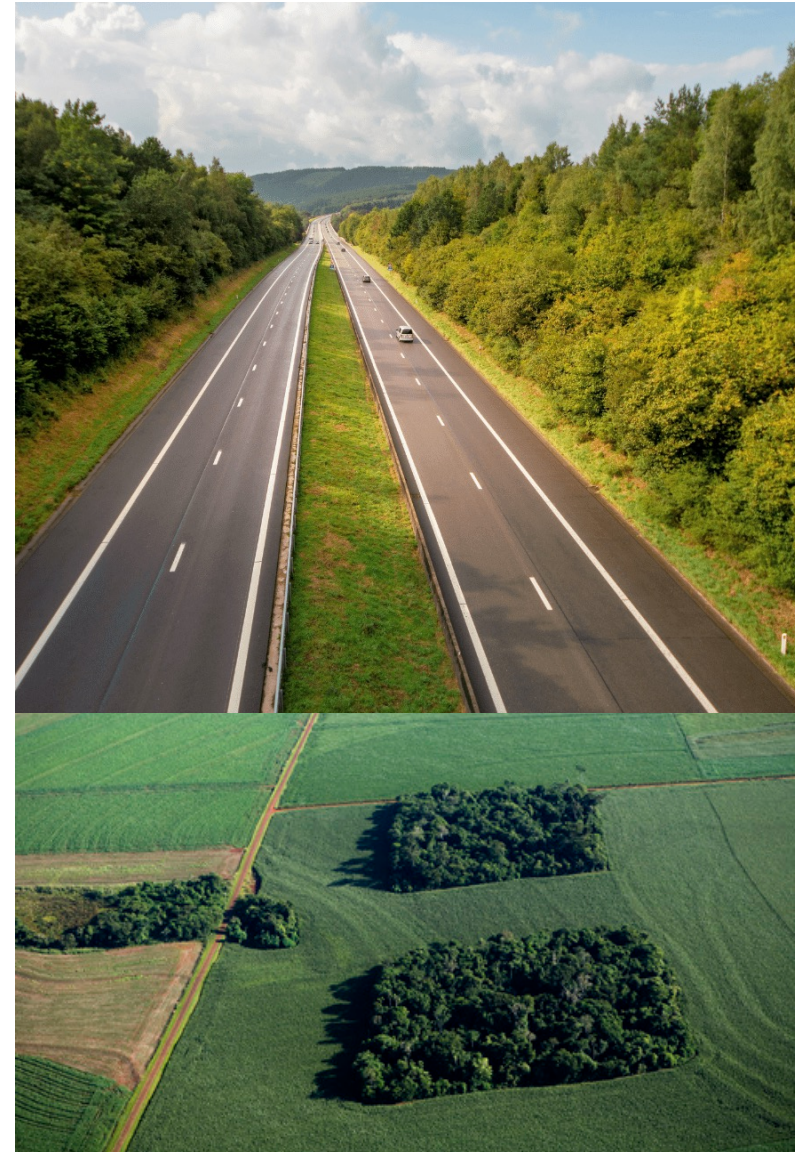


WHAT IS FRAGMENTATION?

Fragmentation: disruption of vegetation types by man or by natural processes

Area-sensitive species need large, unfragmented area in a certain successional stage to provide habitat needs. Require unfragmented habitat of at least 100 acres; some need more.

- Greater Prairie Chicken



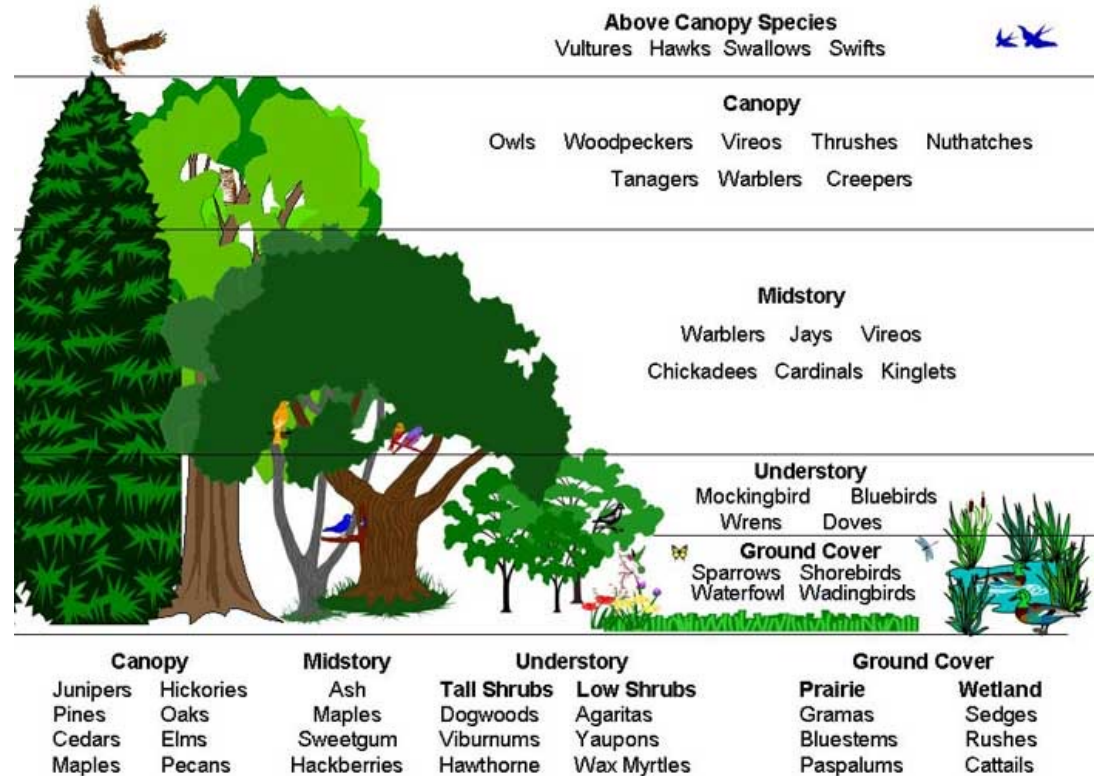
VERTICAL STRUCTURE

Vegetation has layers

Layer arrangement matters to wildlife. May forage in one layer, hide in another, nest in a third.

Arrangement varies by site and may be changed through management techniques.

Ex: prescribed fire reduces understory in forest





CARRYING CAPACITY

Is there a limit to how many people can be in this room?

Carrying capacity: number of animals that can exist in one area

Biological carrying capacity: maximum number of animals within a species an area can support before that species or another species is negatively affected

Why is there a limit?

Limiting factor: resource in shortest supply. Determines carrying capacity.

Increasing LF increases _____.

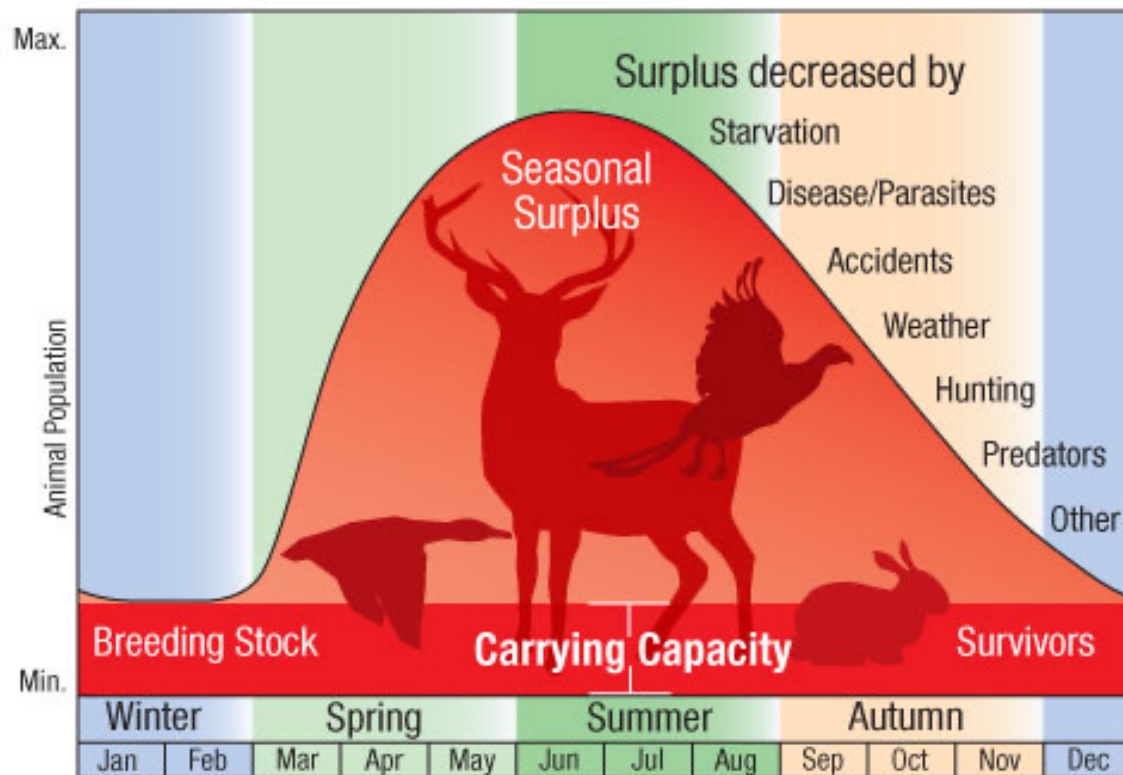
DOES CARRYING CAPACITY CHANGE?

What can influence limiting factors?

- Food, cover, water, space

Does total population stay constant?

Management techniques can change carrying capacity!



WHAT IS MORTALITY?

Annual mortality: rate at which animals die per year

- What things could cause mortality in white-tailed deer?
- Will annual mortality change year-to-year?
- WMP: Increase or decrease harvest

Additive mortality: as more mortality causes are added, survival decreases

- Little rainfall = less ground cover & less food = fewer quail live through summer & fall = low bobwhite population entering winter (malnutrition, predation, heat stress) = winter storm kills off additional quail, causing lower survival

Adaptive management: adjust management practices as conditions change an additional info is available



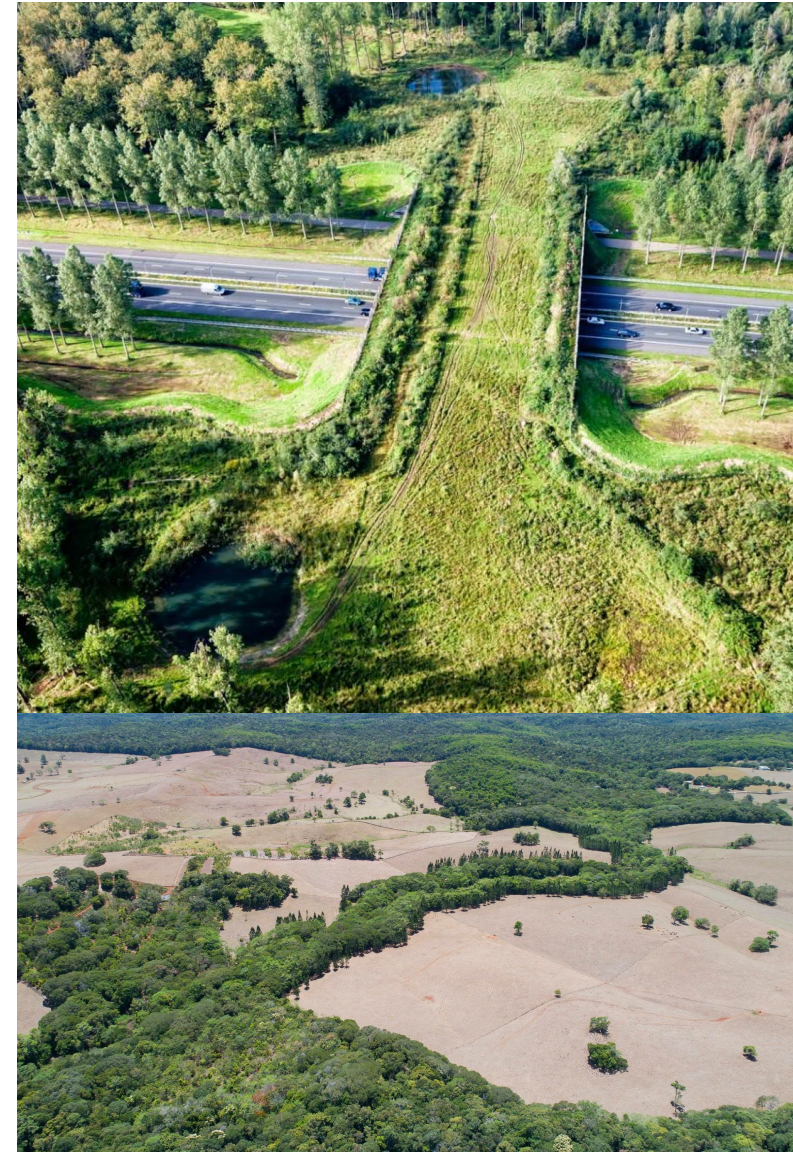
RANGE & MOVEMENT

Home range: area where animal lives. Size relates to habitat quality.

Seasonal home range: area animal uses in particular season or year

Migration: seasonal movement. Animal moves from one seasonal home range to another.

Corridors: areas that allow animals to move around areas in their home range or during migrations. Size and vegetation in corridor needed varies by species.



NEXT TIME

Will learn about Birds of Iowa

Crossword

Review today's content

Check out WHEP resources on Tama County website:

https://www.tamacounty.iowa.gov/conservation/whep_resources/

