



Cascading effects of interactions among Birds, Amphibians, Insects, and Plants placed in a food chain

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NREM 380: Field Ecology Research and Teaching –2020

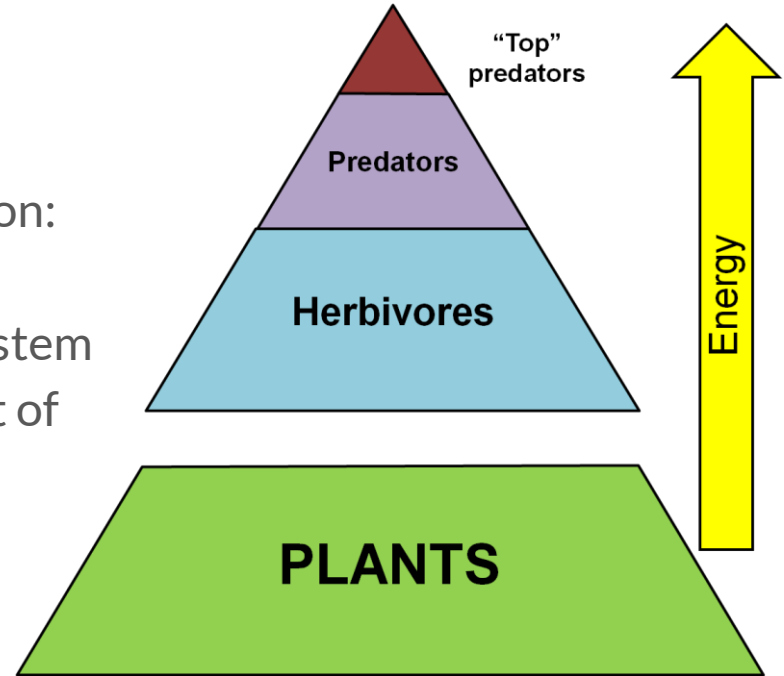
Introduction

- Prairie Habitat
- Animals that would live in a Prairie
- Characteristics of:
 - Birds, Amphibians, Insects, Plants



Central Concepts

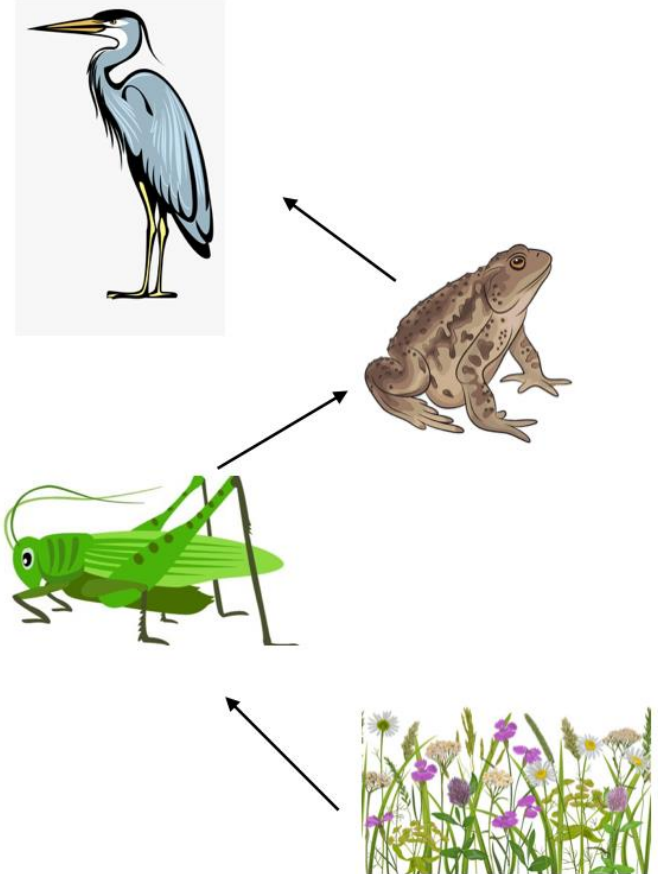
- Central Concepts addressed during the lesson:
 - Construct food chains
 - Visualize path of energy through ecosystem
 - Understand trophic cascade and impact of habitat loss/pollution
 - Recognize importance of biodiversity





Additional Learning Objectives

- Students should be able to:
 - Organize organisms by trophic level
 - Construct data
 - Which organisms eat which Organisms



Audience

- Target Audience:
 - Kindergarten through 2nd Grade
 - Ages 5-8
 - Approximately 20 participants
- Time Requirements:
 - 1 hour to prepare
 - 45 minutes to complete lesson



Study Site

- Local outdoor area
- Tallgrass prairie habitat
- Central meeting area
- Sidewalk
- 15 ft by 15 ft plot to search for species cutouts



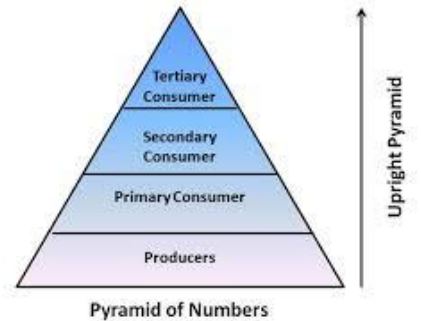
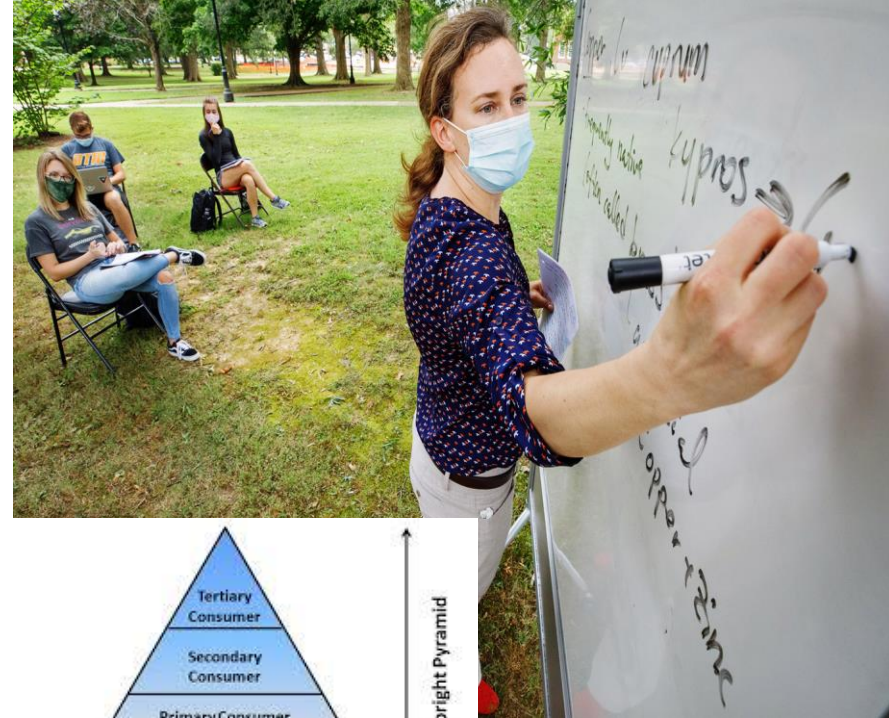
Preparation

- Flag off 15 ft by 15 ft plot to search for species cutouts
- Distributed randomly laminated illustrations of:
 - 1 bird, 2 amphibians, 4 insects, and 6 plants.



Preparation cont.

- Constructed a dry erase board prior to the lesson to show energy pyramid with trophic levels
- Obtain easel to hold board
- To accomodate 20 students
 - 4 plots, 5 students per plot,
 - 13 cutouts per plot





Engaging Students

Questions Asked:

- What is food?
- What is a chain?
- Can food chains include plants? Insects? Frogs?
- Where do you think plants, insects and frogs get their food?
- What benefits do plants, insects, frogs, and birds have?
- What would happen if any of these organisms disappeared and why do you think that?
- How would humans be affected if plants disappeared?
- Does that mean people are connected to the food chain too?
- Is biodiversity important for every organism?

Exploration

- Teams of 3-5 students
- 5-10 minutes or until all species are found
- Returned to central meeting area
- Tally up the number of individuals in each taxa

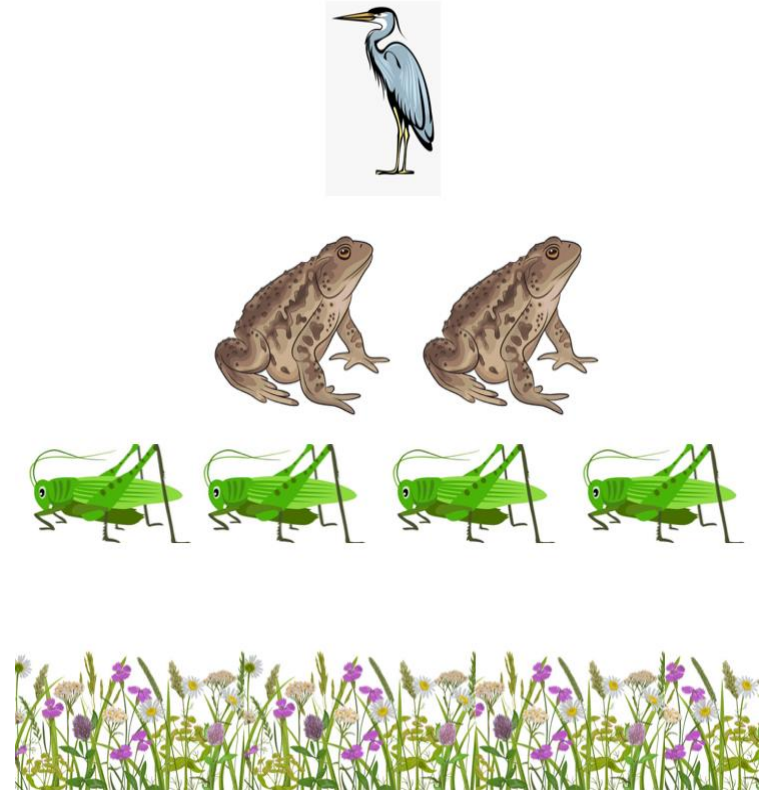




	Organisms Discovered	Total
Birds		1
Amphibians		2
Insects		4
Plants		6

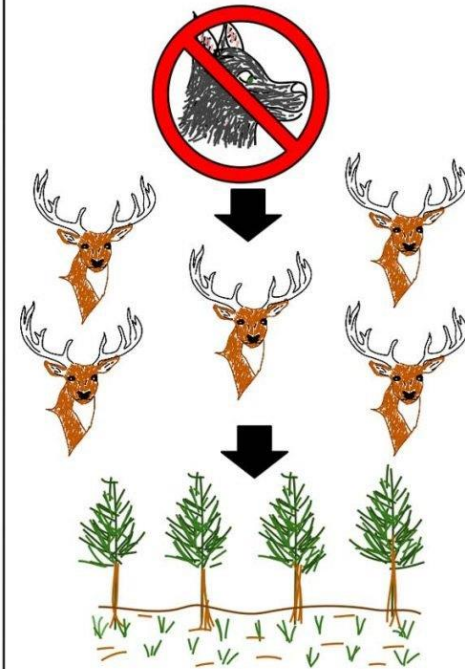
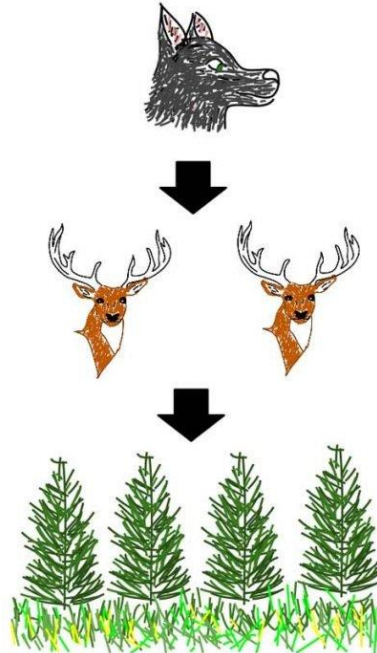
Concept Development

- Energy Pyramid Activity:
 - Shape of the data
 - Plants being producers and insects, frogs, and birds being consumers.
 - More species at bottom, less at top
 - Less energy available at the top



Concept Development cont.

- Trophic Cascades activity:
 - Evaluated what would happen if an organism is removed from an ecosystem





Concept Application

- What would happen if any of these organisms were removed?
- Explain that without insects we don't get pollination and they do not provide any food for amphibians
- Look at the whole and see if students see a pattern of the effect of species being removed
- Food chains are a delicate system, if not kept balanced it causes an effect on all other species
- Not a hypothetical question, it's actually happening

Connections to NGSS

- Used standard K-ESS3-1: Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live
- Developing and Using Models
 - A model to represent relationships in the natural world
- Natural resources
 - Living things need resources, to survive they live where they can get these resources
- Systems and system models
 - Systems in the natural world have parts that work together



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