

- Start Up:** Posters of plant and animal communities, endangered species posters
(5-10 min) Population graphs (see *Project Wild*)
- Welcome/** Staff/Volunteer/Guest Names
Introduction: **Today's Topic-Population Ecology**
1 min. **Question: How do we study groups of plants and animals?**
- Opener:** **Carrying Capacity** (*Project Wild*)-Play a game which illustrates the effect of limited habitat requirements on animal populations.
15 min.
- Divide the students into groups of 3-5
 - Place five markers/student in the center of the play area.
 - Student groups ("herds") each take turns picking up a marker (food), then tagging the next person in their herd to pick up their food.
 - Time the round until food has run out. Repeat.
 - Herd members who don't get food for three rounds die.
 - Discuss what factors would help the population match the carrying capacity to survive the winter (redistribution, more predators, hunting).
 - Play a round including offspring if time allows.
- Background/** Define **population** and **biodiversity** (see below).
Exploration: Ask the students to recall what things can affect a group of animals to the point of endangerment or extinction.
20 min. (over-hunting, habitat loss, capture for pet use, etc., see *Restoration Ecology*)
What can cause population decline in general?
Show some graphs to illustrate population fluctuations related to factors, e.g. prey populations, habitat loss, disease, catastrophic weather (**Birds of Prey, Oh Deer!**).
Mention natural vs. human-induced population fluctuations.
- 30-40 min. **Wildlife Management Expert**-Discuss philosophy and techniques for the study and management of local wildlife with the students.
For example: deer, turkey, waterfowl, raccoons, coyote, bobcat
Questions: How do we study herbivore populations?
How do we study predator populations?
Which animal populations have we helped increase? How?
Which animal populations do we need to control? How?
How important is habitat protection and restoration?
Give examples of how to manage habitat for X species.
- Discuss predator vs. human effects on animal populations.
- How do plant populations affect animal populations, and vice versa?
Think of some ways plant populations could be studied
(identification of species in an area over time, transects, collection of samples).
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Prepare to go Outside: Restroom break.
5 min. Bring: Water bottles
Apply: Sunscreen, Bug Repellant (if necessary)
Trail Rules (see The First Program).
What we will do/What to look for-Signs of animals, plant populations

OUTDOOR EXPLORATION: **Frog & Toad Survey** (*Experience Iowa Wetlands*)-
1 hr., 15 min. Hike to an ephemeral pond, puddle, or other wetland.
Listen for frog calls. Try to identify the calls and gauge their abundance.
You can use a tape or *Birdsong Identiflyer™* to help identify the calls.

- Take the air temperature, water temperature, and wind speed.
- Use field guides or pictures to show students what the frogs look like.
- Let students know about the DNR's Frog & Toad Survey program and how they can participate.

Wetland Sampling (*Experience Iowa Wetlands*)-
Use nets and cups to gather wetland invertebrates and plants from the water and mud.

Count the organisms from a specific collection area (*OBIS*).
Discuss how to use the information to gauge wetland health/biodiversity.
Use an invertebrate i.d. sheet to help in identification of organisms.

Activity: **Plant populations**-Explain the use of transects in gathering data on plant populations.
Lay a transect and take some data (*Project Bluestem*).

Closing: Learning about and studying animal and plant populations helps us to protect biodiversity.

Send Off: Goodbye!
Next Month-Invasive Aliens

Take Home: Parent Outline
Nametags

Vocabulary

Population, ecology, biodiversity, carrying capacity, endangered, extinct, transect, community, hervivore, predator

Background and Activity References for Naturalists and Parents

www.iowadnr.com Information on protecting the environment
Wildlife Diversity Program: Frog & Toad Survey-help with research on frog populations
www.extension.iastate.edu/naturemapping NatureMapping program
help w/research on a variety of species
<http://nwf.org/frogwatchUSA/> National frog survey program-National Wildlife Federation

Experience Iowa Wetlands: A Field Activity Guide. 199-. Iowa Conservation Education Council, Iowa State University, Ames. Pp. 105-109 Frog & Toad Survey;
pp. 81-83 Water Bugs-aquatic sampling w/i.d. sheet; low water quality indicator organisms
Miller, Lenore Hendley. 1986. *The Nature Specialist*. American Camping Association, Martinsville, IN.
P. 40 Counting Populations activity
Outdoor Biology Instructional Strategies (OBIS). 1975. Regents of the University of California.
How Many Organisms Live Here? pond bottom survey
Project Bluestem: A Curriculum on Prairies and Savannas. 1995. Walnut Creek National Wildlife Refuge and Prairie Learning Center, Prairie City, IA. Pp. 219-220 Transect Search
Project Wild: Activity Guide. 1992. Western Regional Environmental Education Council, Inc., Bethesda, MD. Pp. 146-149 Oh, Deer!-Lynx/hare graph; pp. 150-151 Birds of Prey-graphs; pp. 152-153 Carrying Capacity game; p. 164 Turkey Trouble
Ranger Rick's Naturescope: Let's Hear it For Herps! 1987. National Wildlife Federation, Washington, D.C.
P. 28 Background on frog calls
Ranger Rick Naturescope: Incredible Insects. 1989. National Wildlife Federation, Washington, D.C.
Pp. 30-40 Population Count

Population-A group of the same kind of organisms living and reproducing in a particular area.

Biodiversity-The variety of organisms present in an ecological community.

Extensions/Alternate Activities/Rainy Day

Related *Project Wild* activities: **Oh, Deer!; Birds of Prey; Turkey Trouble**

Sample prairie insect populations by collecting in a specific area and recording types and numbers.

Do the population counting activity with students to prove that representative sampling works (Miller).

Supplies:	Plant/animal community posters	
	Population graphs	
	Markers for Carrying Capacity	<i>Birdsong Identiflyer™</i>
	-golf balls, 5/student	w/frog card or frog call tape/CD
	Wetland sampling:	Frog Survey data sheet
	Dip nets	Frog field guides
	Yogurt cups	Clipboards/clips
	2 thermometers	Paper
	Wind gauge	Pencils
	pH paper	100' measuring tape
	Aquatic invertebrate key	

Advance Preparation: Invite a wildlife biologist or related professional to speak about managing local animal populations.

Find some items to use as “food” for the **Carrying Capacity** game. Golf balls work well outside, paper squares or beans for inside use.

Pre-collect some aquatic invertebrates to show to the students.

Copy data sheets for the frog survey.

Make a record sheet for the aquatic invertebrate survey if you will record the data.

Copy the transect record sheet for the plant population survey.

Transect Record Sheet:

Foot	Grass	Grass-like	Forb (flower)	Shrub	Tree	Other
1						
2						
3						
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