

Gambling for Survival

Theme

The success of the hunt is never guaranteed. It is all about energy. A successful hunt for a bird of prey is one that gains the bird a lot of energy while the bird expends very little energy.

Learning Objectives

Vocabulary

energy	prey
predation	top predator
predator	food chain

Introduction

Predation

Predation is perhaps the most misunderstood of natural processes. In very simple terms, it is defined as one organism eating another. Predation, however, involves a complex interaction between a predator and its prey. Predator and prey developed over thousands of years together. The number of predators in an area may be influenced by the abundance of prey and/or the numbers of prey may be regulated by the predator. Without outside interference, predation helps to maintain an ecological system.

Predators are categorized as specialized or generalized. Specialized predators are adapted to hunting only a few kinds of prey. Some specialized raptors include the Snail Kite, which only eats snails, the Osprey, which only eats fish. Generalized predators are not restricted to a specific kind of prey—they eat many kinds of prey. Great Horned Owls and Red-tailed Hawks are generalized predators.

Hunting Techniques

The hunting techniques of raptors are as varied as the birds themselves. Most raptors rely on keen vision and flexible necks (diurnal hunters), keen hearing (owls, harriers), or combinations of these to locate their prey. The majority of raptors hunt from a perch, then pursue prey when it comes into view. We have all seen hawks and falcons perched on utility poles scanning the surrounding countryside. Caracaras and Secretary birds often scratch the ground in their search for lizards and insects. Harriers and some kites course or fly low across the ground, watching and listening for possible prey. Species as different as kestrels, Ospreys, and buteos are frequently seen hovering, held aloft by flapping wings.

Most species of diurnal raptors do some soaring, which assists them in locating their prey. Accipiters dart from perch to prey in rapid, skillfully maneuvered flight. They combine surprise and speed. Power dives or stoops are spectacular head-first pitches employed most typically by falcons. Ospreys plunge feet-first in pursuit of fish, and often precede their dive with hovering. A few species (including Bald Eagles) are pirates, stealing food from other raptors. Scavengers search the ground for carrion.

The success of the hunt is never guaranteed. It depends on the skill of the hunter and the type of prey pursued. All adaptations combine to make raptors superb hunters. Eyes four to eight times more powerful than humans', deadly taloned feet, flesh-ripping beaks, and a variety of hunting styles come into play in each successful hunt. Most of the actual killing is done with the feet and talons, although falcons and owls frequently dispatch their prey with a carefully-placed bite at the neck. Bald Eagles can strike their prey with twice the force of a rifle bullet.

Food Chains

The sun sustains all terrestrial life. Green plants capture a tiny portion (1/10 of one percent) of the sun's energy through a process called photosynthesis. Half of this captured energy is stored in the plant tissues. Green plants which capture the sun's energy are called producers. Animals eat green plants to obtain energy and nutrients. These plant eaters (herbivores) are called primary consumers. Primary consumers are eaten by secondary consumers, often known as carnivores or omnivores. The successive steps of energy transfer from green plants to carnivores, of eating and being eaten, is called the food chain. Many food chains interlink to form food webs.

At each level of the chain there is an 80 to 90 percent loss of energy. As we advance along the chain, each level can only provide enough energy to support about ten percent of its living weight per unit of area (biomass). Organisms at the lower ends of the chain are more abundant than organisms at higher levels. Organisms at the lower ends of the chain are generally smaller and require less space than animals at the higher levels. Small seed-eating finches are relatively common, while Goshawks are relatively rare.

Birds of prey occupy the top levels of food chains. Very few are eaten by other animals. An Osprey eats fish, which may have eaten smaller fish, which may have eaten phytoplankton. The Osprey is the top predator. Man could also be the top predator in this chain—he may catch and eat the same fish. Man is the top predator of many food chains.

Example of a Food Chain

Grass is eaten by grasshoppers. Grasshoppers are eaten by meadow mice. The mice are eaten by a snake. A Red-tailed Hawk eats the snake. The Red-tailed hawk is the top predator.

Activity: Gambling for Survival

Materials Required: 4 Ziploc bags, 4 die, 60 poker chips, Hunting Outcome Poster

Steps

1. Divide the tour group in to 4 groups.
2. Give a bag with 10 energy chips to each group. Explain that the bag represents their starting energy. Point out that hunting both expends and gains energy.
3. Announce that each group represents a hunting Red-Tailed hawk.
4. Have each group roll their die.
5. Have the group read the number on the die and find their hunting outcome on the Poster of Hunting Fate.
6. Have the groups determine the energy expended, and remove that many energy chips from their energy bag. If a group removes all their energy chips from the bag, they are out of energy and no longer in the game!
7. If the group is still in the game, determine the energy gained, and add that many energy chips to the bag
8. Roll the die 2 more times and repeat steps 4-7 (unless you run out of energy chips)

Hunting Outcome	energy expended	energy gained
1. You find a recently dead rabbit.	-3	+6
2. You hunt for 2 hours a miss a quail.	-4	0
3. You steal a bird from a Sharp-shinned hawk.	-3	+5
4. You hunt all day and find no prey.	-6	0
5. You dive on a snake, get injured and cannot eat for 5 days.	-8	0
6. You sit perched for 3 days during a snow storm.	-4	0

Following and Test for Understanding

- Ask participants, “Do birds of prey hunt for fun?”
- Discuss with the groups why some hunting outcomes have both a loss and gain of energy.
- Which hunting outcome was the most favorable to the raptor? Which was least favorable?
- Can the groups think of a hunting method that would involve a minimum amount of flying? (hunting from a perch)
- What is the ultimate source of energy for any food web?
- How does the analogy of gambling apply to a bird of prey hunting?
- Gamblers like to increase their odds. What sorts of things increase the odds of hunting success for a bird of prey? What sorts of things decrease the odds of hunting success?