Owl Pellets
APES
Lindemulder

Introduction

Barn owls (Tyto alba) swallow small birds and rodents whole, and the resulting pellets generally generally contain the complete skeletons of these prey. The pellets begin forming within the digestive tract of the owl as soon as the prey is swallowed.

Enzymatic juices break down the body tissues of the prey but leave the boney materials and hair or feathers undigested. Depending upon the prey eaten, the undigested portions may include beaks, claws, scales, or insect exoskeletons. This type of material has little nutritional value and must be passed from the body.

Predatory mammals such as bobcats and wolves have teeth to grind up bones and claws, and a digestive tract adapted to pass the ground parts. Owls, on the other hand, do not have teeth for grinding and cannot pass whole bones and claws through their digestive tract safely. Instead, these materials form a bolus (or pellet) which is surrounded by the hair or feathers of the consumed prey. The pellets are then orally expelled, and the owl begins feeding once more.

Scientists take advantage of this adaptation by collecting these pellets and examining their contents. Since owls are not very selective feeders, these pellets can be used to estimate the diversity of available prey. The contents are also a direct indicator of what an owl has fed on; information that is crucial for species management and protection.

Part I: Dissecting Owl Pellets

Procedure

To dissect pellets, first remove them from the aluminum foil casing. Label a sheet of clean paper with your name and place the owl pellet on it. Using the dissecting needle provided, begin to loosen the hair and/or feathers of the owl pellet. As bones are uncovered, carefully remove them and place them to the side of your sheet of paper. If you prefer, you can label a small sheet to hold the bones of each prey item that you extract. After you have removed all skulls and bones, you can begin to identify the prey.

Part II: Using a Dichotomous Key

Procedure

Pellet contents can be identified using two methods. The first of these methods is a dichotomous key. To use a dichotomous key, simply compare the first pair of statements and determine which one best fits the article you are trying to identify. After you pick one of the paired statements, you will be directed to other paired statements until you reach for an answer.

Use the included dichotomous key to identify the skulls of small mammals found in your pellets and record the number of each type. Record your findings.

Part III: Diet of a Barn Owl

Procedure

There are many genera of prey that occur in the Northwest. There are nine mammalian prey types that account for 96-100% of the prey that you will find in your investigations. Any other prey will be composed of birds, bats, and insects. These are occasional and too diverse to address in detail.

Occurrence

- **** Very common
- *** Common
- ** Occasional
- * Rare

Create a chart similar to this in your notebook

Prey	Occurrence	Number Found	Prey Weight (Biomass)	Total # Found by Class	Total Biomass
Pocket Gopher *Thomomys*	***		150g		
Rat *Rattus*	*		150g		
Vole *Microtus*	*		40g		
Mice *Peromyscus* *Mus* *Reithrodontomys* Perognathus	 ** *** ** **		 22g 18g 12g 25g		
Mole *Scapanus*	*		55g		
Shrew *Sorex*	**		4g		
Other Prey *Bats* *Birds* *Insects*	 ** ** **		 7g 15g 1g		

Part IV: Constructing a Food Web

Procedure

A food web is a relationship diagram showing organisms arranged by energy flow from organisms to lower trophic levels to higher trophic levels.

Construct a food web that contains a Barn Owl at the highest trophic level and grasses and seeds at the base. The intermediate organisms that you show may include every prey type listed on the chart or found by the class.

Questions

1. How would a crash in the shrew population affect the Barn Owl population?
2. How would a crash in voles affect the Barn Owl population?
3. If an owl needs 120g of food per day, how many *Sorex* would it need to capture? How many *Microtus*?
4. Assume an owl eats fifty 1g insects and one 100g rat. In terms of biomass, did the insects or rat contribute the most to the owl's diet? How does foraging time affect this?
5. Is quantity or quality of prey more important?
6. Evolutionarily speaking, why would an owl evolve the ability to swallow prey whole?