

DO NOT WRITE ON THIS

Owl Pellet Lab

Background:

From the deer pounced upon by the mountain lion to the ant snapped up on the tongue of a horned lizard, predator-prey relationships command our attention. Witnessing the actual event of predation is rare; therefore, scientists studying predator-prey relationships often must resort to examining the aftermath (carcasses, feces, and pellets). Owls are a major nocturnal predator, especially on small mammal populations. Owls tend to swallow their prey whole. The "mouse" slides down the esophagus and into the stomach (proventriculus in birds) where acids begin to breakdown the meat. The fur and bones are indigestible. The "mouse" goes to the muscular gizzard for mashing to expose new surfaces to the stomach acids. Finally, all the meat has been dissolved and passed into the long, tortuous passageways of the intestines for absorption and use by the owl. The remaining fur and bones are packed into a neat pellet and regurgitated. This is a nice way to reduce weight for flight. Other birds that take in a lot of indigestible parts (fur, feathers, scales, bones, insects' shells, etc.) in their diet also regurgitate pellets (e.g. other birds of prey, fish-eating birds, beetle-eating birds, etc.). Therefore, by identifying the pellet parts, one may study the diet of the bird on a day-by-day basis. It is much easier to collect the pellets below the bird's roost than to chase the bird around waiting to see what it eats. We will study the pellets from the Common Barn Owl (*Tyto alba*) (14-20" in height) that occurs throughout most of the U.S.

Procedure:

1. Place an owl pellet on a white sheet of paper. (If you like, you may dip the pellet in water for a few seconds first. The water will cut down on dust, but may make it harder to remove the fur from the bones.)
2. Using your fingers, forceps, and probes, carefully separate the bones from the fur of the pellet. Make sure that you get all of the bones, even those that are very tiny. Check over the fur thoroughly to make sure that you get all of the bones out. Some of the bones (especially the skulls) may be very fragile.
3. Clean the bones of debris and sort them according to type (for example, skulls, ribs, vertebrae, etc.) Use the skeleton picture below.
4. Identify the number and types of bones you find. Record the numbers in your data table.
5. Clean the skulls as thoroughly as possible since these are the best bones for identifying prey.
6. Determine the number of prey in the pellet (by the number of skulls or jawbone pairs). Use the *Key to Skulls in Owl Pellets in the Pacific Northwest* to identify your prey animal(s). Record the number and types of prey you find in your data table.

Conclusion Questions:

1. Sketch a potential food web that would include an owl, its prey, and at least 5 other organisms. Then, assuming the owl represents 10 units (mass or energy), sketch and label a biomass pyramid and energy pyramid that include these organisms.
2. Is the owl pellet the "end" or termination of a food chain? Explain. Is it the "end" or "termination" of a food web? Explain with some detail and/or examples.
3. Based on your findings, would you consider the owl a specialist or generalist? Explain?
4. Name 3 limiting factors to the owl population. Explain why they are limiting.
5. If the owl population were to decrease, describe the potential trophic cascade that would result.

KEY TO SKULLS FOUND IN OWL PELLETS

Find all upper and lower skulls in your owl pellet, and then use the following key to identify the types of prey.

Skull Characteristic: choose either a or b	Prey type or go to question #
1a. Skull does not have teeth	Bird (Aves)
1b. Skull has teeth	Mammalia -- Go to 2
2a. Skull does not have a space between incisors and other teeth (diastema)(Fig. 1)	Go to 3
2b. Skull has a diastema (a space between incisors and other teeth)	Go to 4 (skip3)
3a. Skull does not have a zygomatic arch (Fig. 1); teeth reddish brown at tips	Shrew (Family Soricidae)
3b. Skull has a zygomatic arch; teeth white	Mole (Family Talpidae)
4a. Cheek teeth are angled (see Fig. 2)	Go to 5
4b. Cheek teeth are lobed	Go to 6
5a. Mandible length (see Fig. 3) 15-20 mm	Vole (Subfamily Microtinae)
5b. Mandible length 25-35 mm	Pocket Gopher (Family Geomyidae)
6a. Mandible length (see Fig. 3) 10-16 mm	Deer Mouse (Subfamily Cricetinae)
6b. Mandible length 17-30 mm	Rat (Genus Rattus)

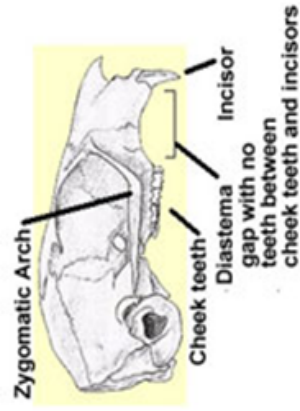


Figure 1. Side view of upper skull.

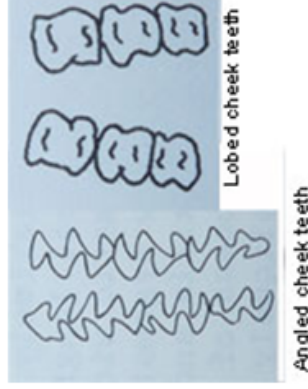


Figure 2. Chewing surface of cheek teeth.



Figure 3. Side view of lower jaw.

