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Integrated Pest Management in Idaho: Discovering the Diet of Idaho Barn Owls

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Abstract

Farmers in Idaho's canyon county have a pest problem: gophers (*Thomomys townsendii*). These agricultural pests eat or otherwise damage crops and dig holes that disrupt fields and irrigation canals. To reduce the number of gophers without the use of harmful rodenticides, which have the potential to poison secondary wildlife, Canyon County Weed and Gopher Control has developed an integrated pest management program. This program included installing barn owl (*Tyto alba*) nesting boxes with the intention of attracting barn owls that would reduce gopher numbers through predation. But do barn owls actually prey on gophers? To find out, we collected regurgitated owl pellets found in and around nest boxes that were analyzed for prey contents. Based on analysis of 1,552 pellets from 47 nest box sites, we found 24 different prey species. The main staple of an Idaho barn owl's diet was the mountain vole (*Microtus montanus*). The mountain vole made up 67.6% of the prey items found in the pellets analyzed. Only a small percentage of prey items were gophers (2.3%). Although gophers make up a small percentage of barn owl diet, the boxes have still been somewhat effective in controlling the gopher and other rodent populations based on our prey analysis and comments from local landowners about observed declines in gopher damage in fields. Thus, integrated pest management with barn owls is a viable option compared to labor intensive gopher trapping or the use of pesticides.

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INTRODUCTION

- Gophers (*Thomomys townsendii*) cause damage to agricultural fields and crops in Idaho's Canyon county.
- Canyon County Weed and Gopher Control installed barn owl boxes to mitigate this problem.
- Studies done on barn owl diets in other regions have found that barn owl diets consist mainly of voles and mice (Marti, 2010).
- Our project aimed to examine the extent to which barn owls included gophers (*Thomomys* spp.) in their diet in the study area.

METHODS

1. Collected 1,552 regurgitated owl pellets from nest boxes in Canyon County, Idaho. Prey remains (skulls and other bones) were analyzed from pellets collected at 47 different sites.
2. Soaked owl pellets in sodium hydroxide to dissolve fur and enumerated prey contents – quantified 3,379 individual prey items.
3. Identified prey species from skulls – at least 24 species were present.



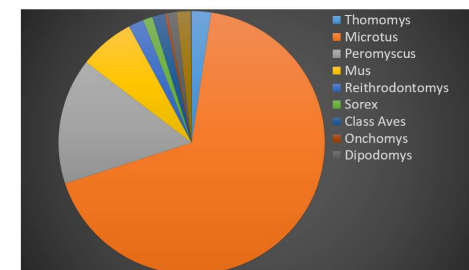
RESULTS

- Average of 2.17 prey items per pellet.
- Of the prey items identified, 67.6% were montane voles (*Microtus montanus*).
- Only 2.3% of prey items were gophers (genus *Thomomys*).
- Mice made up a large percentage of the diet as well - 15.5% of prey items were *Peromyscus* (deer mice) and 6.8% were *Mus* (house mice).

Integrated Pest Management with Barn Owls is a Viable Alternative to Chemical Rodenticides



Species of Prey Items Found in Barn Owl Pellets



• IMPLICATIONS

- Although gophers made up a small percentage of a barn owl's diet, they were still being captured by owls.
- Barn owls eat around 2 rodents per night each (Marti, 1998). So, a brood with 10 nestlings would consume 1200 rodents in just a 60-day period. This would be a substantial reduction of rodent pests!
- Montane voles, which make up the largest percentage of barn owl diets, are also destructive to agricultural practices (Sullivan et al., 2018).
- Thus, integrated pest management with barn owls is a viable approach to reducing rodent pests. Use of this strategy could help reduce the need for chemical rodenticides.
- Chemical rodenticides travel up the food chain, causing secondary poisoning to non-target species such as predators as well (Rattner et al., 2020).

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