



# Rural Rodent IPM

*Rodent Academy, October 24, 2023*

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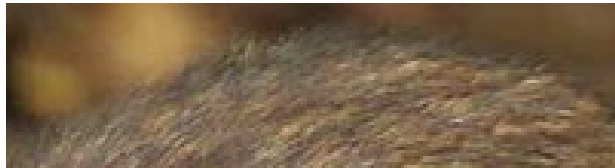
# A Community-Wide Issue

News Center Maine

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May 19, 2020



The Portland Press Herald

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Apr 5, 2023



Maine Public

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Oct 10, 2018



WABI

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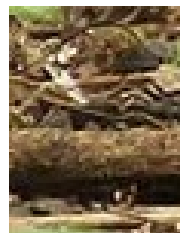
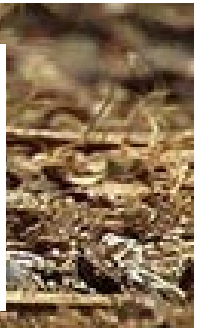


Bangor Daily News

## Caribou residents terrorized by rats 'as big as guinea pigs'

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Dec 18, 2022

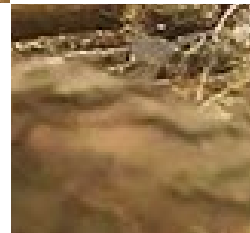


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Dave Oliver has found about 60 rats this year, and he's determined to exterminate them.

May 31, 2022



WMTW

## Maine man's 'illegal junkyard' home to rats as big as cats, neighbor says

The owner of a Fairfield antique business said his neighbor's property is home to rats as big as cats and is a fire waiting to happen.

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1 day ago

# A Community-Wide Issue


 The Portland Press Herald

## [Boom and doom: Squirrel population surges in Northeast, as](#)

...

There are more than 350 species of squirrels worldwide, but the eastern gray squirrel is the most common in Maine. The rodents known for their bushy tails are...


Sep 4, 21

 WMTW

## [Amid population boom, South Portland woman finds 2 dead squirrels in toilet](#)

A Maine woman came home from a weekend trip to find two dead squirrels in her toilet. Jess Cary, of South Portland, said she came home Monday to find the...


Oct 9, 2018

 WGME

## [This is why Maine rodents may be snacking on your car](#)

The increasing popularity of plant-based and organic materials in automobile and truck parts is good for the environment.


Jun 22, 2023

 Foster's Daily Democrat

## [Surviving the squirrel apocalypse of 2018](#)

Editor's Note: Lara Bricker is a columnist for the Exeter Newsletter, a companion publication of Foster's Daily Democrat.

Sep 21, 2018

 WMTW

## [More mice invading Maine homes: Here's why](#)

Experts say an abundance of mice and a lack of food are driving them into more homes as winter arrives.

Nov 14, 2018

 WABI

## [Bumper crop of acorns as Maine becomes squirrel paradise](#)

It's a boom year for...

Oct 20, 2019

 WCYY

## [Here's Why Another Squirrel Apocalypse in Maine Could Be Coming](#)

Conditions are lining up for Maine to experience another unfortunate event: a squirrel apocalypse similar to 2018.

1 month ago

 The Portland Press Herald

## [Fearing a mousepocalypse, Maine farmers aren't messing around](#)

Rodents can cost a farmer dearly, not just in the price of seeds or young plants, but in time, perhaps the most precious commodity.

Apr 22, 2018

# Rural Challenges

- Limited access to professional pest control services
- Scarce financial resources for comprehensive control programs
- Lack of public awareness and education about rodent control
- Inadequate enforcement of regulations and ordinances



Photo: Census Bureau



# Exacerbating Behaviors

- Improper waste disposal and open garbage containers
- Abandoned structures and lack of building maintenance
- Increase in backyard chicken flocks
- Wildlife feeding
- Failure to report rodent sightings or infestations promptly



# Exacerbating Behaviors

- Reluctance to invest in property maintenance and exclusion methods
- Hesitation to engage with local authorities and pest control professionals
- Resistance to adopting integrated pest management (IPM) principles
- Inconsistent enforcement of regulations due to community apathy
- Inadequate involvement in community-wide efforts to address the issue





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1 day ago

# Community-Wide Approach

**A Community-Wide Problem  
Requires a Community-Wide  
Approach**





# Coordination and Leadership

- The role of local leadership:
  - Health departments
  - Code enforcement
  - City Council
- Establishing a rodent control committee:
  - Efficient coordination
  - Resource mobilization



# Rodent Regulation and Enforcement

- Establishing Clear Guidelines
- Sanitation Requirements
- Building Maintenance Standards
- Baiting and Trapping Guidelines
- Inspection and Reporting
- Public Health Enforcement
- Exterior Cleaning Standards
- Penalties for Non-Compliance

BDN Bangor Daily News

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1 day ago



# Community Engagement

- Encourage community involvement in rodent control efforts
- Public education and awareness campaigns
- The role of local organizations and volunteers
- Involving schools and local organizations
- Rodent Control Workshops
  - Hosting educational workshops
  - Expert-led sessions



Photo: Manalo & White Architects



Photo: City of Santa Barbara

# Monitoring and Reporting System

- Establishing a reporting system:
  - Establish a user-friendly reporting system, such as a dedicated phone line or website, to collect information on rat sightings or issues.
- Regular inspections:
  - Conduct scheduled inspections of public and private properties to identify and address rat infestations promptly.





# Data-Driven Decision-Making

- Utilizing data for informed decisions
  - Identify trends
  - Target interventions
  - Evidence-based decisions
- Adaptation based on data:
  - Adjust rodent control strategies based on data analysis, allowing for more effective and efficient responses.



# Collaborative Partnerships

- Partnering with local businesses
- Non-profit organizations and volunteers
- Volunteer Support
- Joint Initiatives
- Awareness and Advocacy
- Data Collection
- Technical Support
- Financial Support



# How Pest Control Companies Can Help

- Provide Expertise in Pest Control
- Safe and Responsible Pesticide Use
- Identification of Infestation Sites
- Tailored Control Measures
- Monitoring and Reporting
- Timely Response
- Integrated Pest Management (IPM)
- Public Education
- Collaboration with Local Leadership
- Data Sharing
- Responsible Disposal of Rodenticides



Photo: Bureau of Labor Statistics





# Financial Resources

- Public Health Funds
- Agricultural Programs
- Environmental Grants
- Community Development Block Grants
- Non-Profit Organizations
- Private Donations
- Partnerships
- Emergency Funds
- Municipal Budget Allocation
- Local Taxes



# Metrics for Measuring Success

- Reduction in Rodent Sightings
- Decrease in Infestations
- Economic Impact
- Resident Satisfaction
- Data on Rodent Population
- Inspection Data
- Long-Term Trends
- Environmental Impact

**RODENT SIGHTINGS**



# Rodents in Rural Maine (& our small cities!)

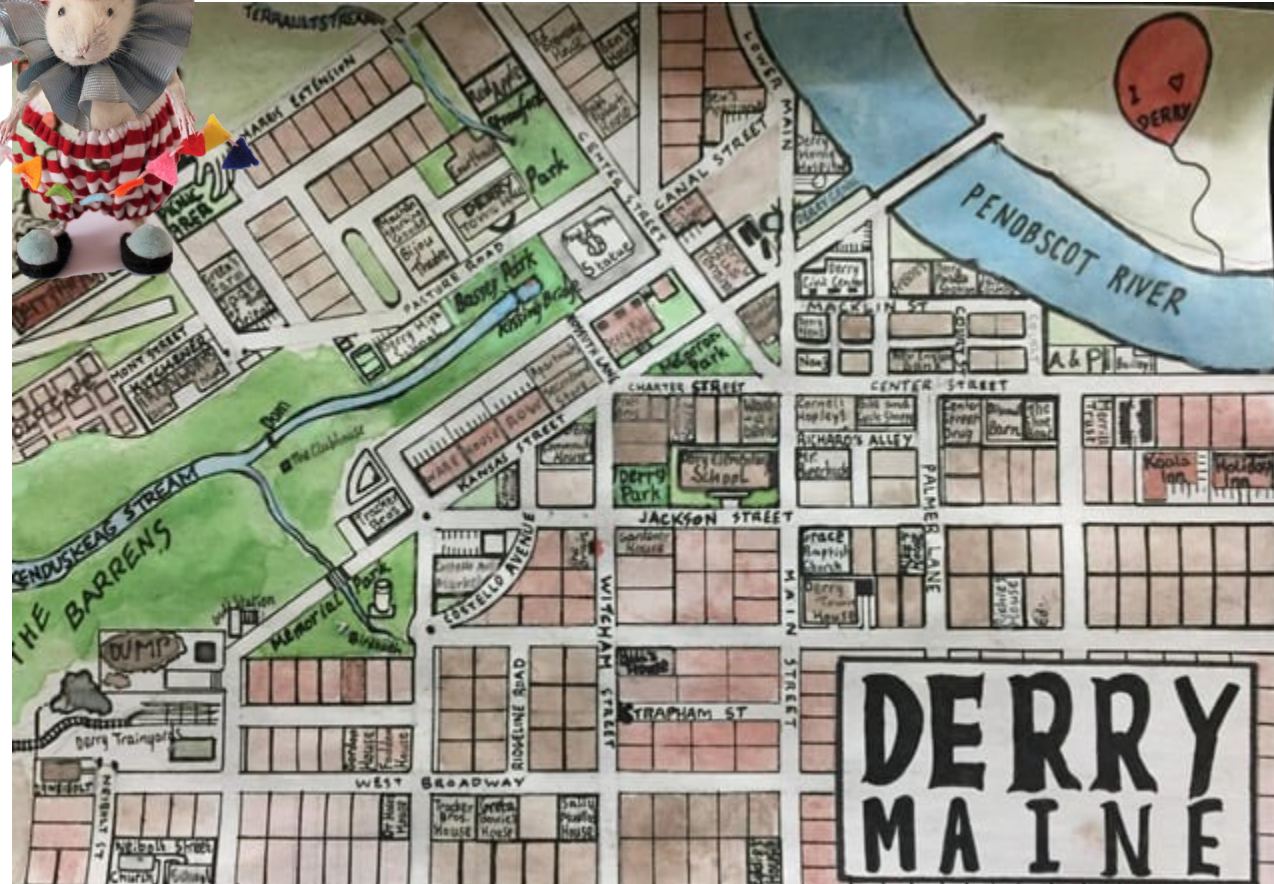
## Municipal Areas

- Dumpsters
- Parks
- Dumps
- Municipal Facilities



## Small Farms, Backyard Operations, & Homesteading

- Backyard chickens
- Bird feeders
- Pets
- Gardens
- Beekeeping



## Large Farms

- Potatoes
- Berries
- Apples
- Poultry Farms / Barns

## Schools

## Homes & Apartment Buildings

How do we best  
communicate about  
rodent IPM?



# What is integrated pest management?

## **Identification**

- Proper identification of pest
- Understanding the system where the pest exists

## **Prevention, Cultural & Mechanical Control**

- Prevent and control through physical means
- Set your location up for success

## **Monitoring & Recordkeeping**

- Monitor in a tracked and systematic way
- Make it useful for the future!

## **Action Thresholds**

- What is the population level?
- What methods are needed at this level?

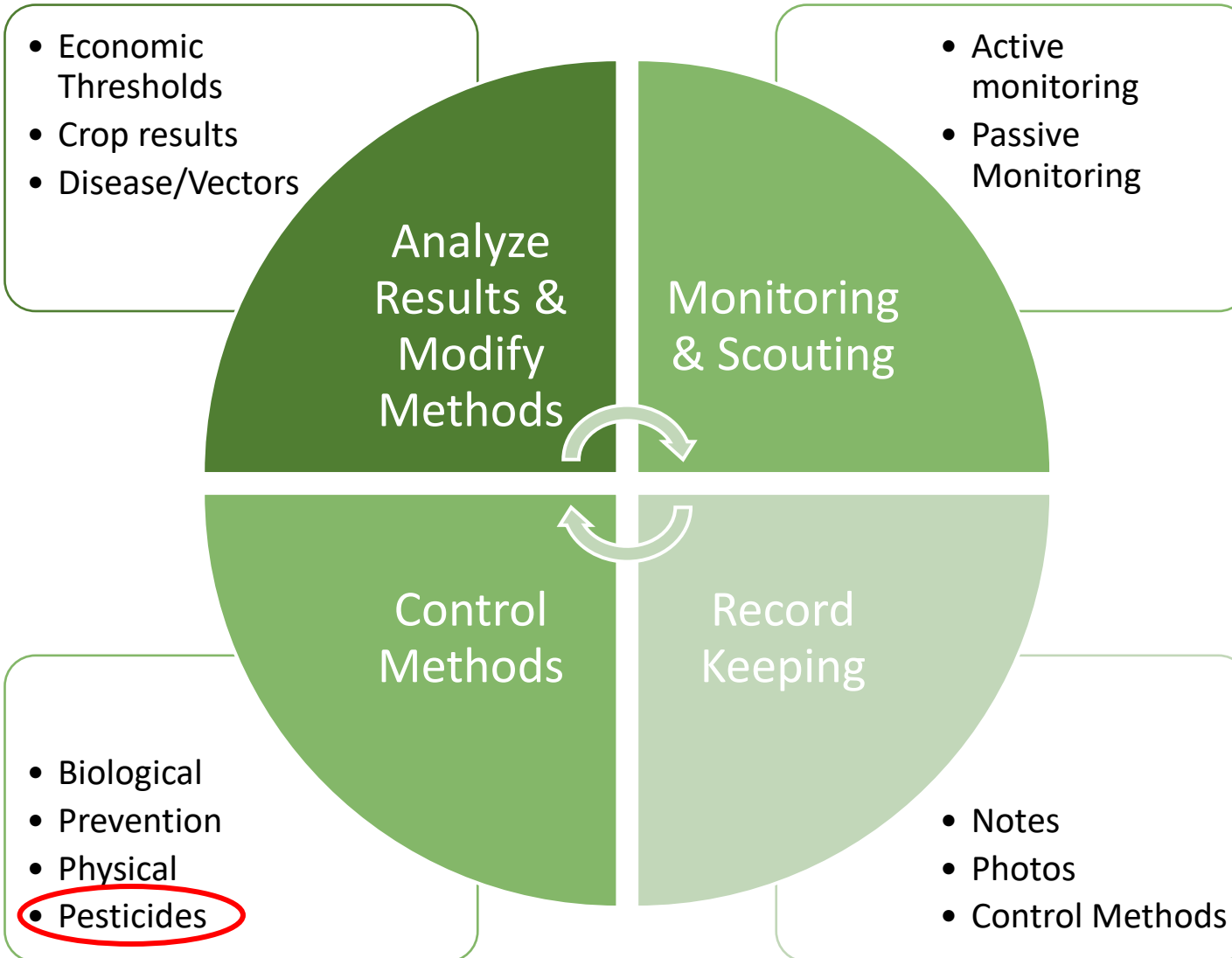
## **Biological and Pesticide Control**

- Dynamic and flexible as methods change

**IPM is the standard, and many institutions are involved**



# The IPM Cycle



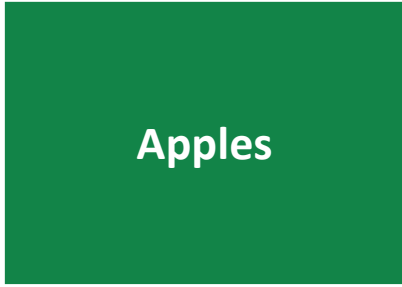
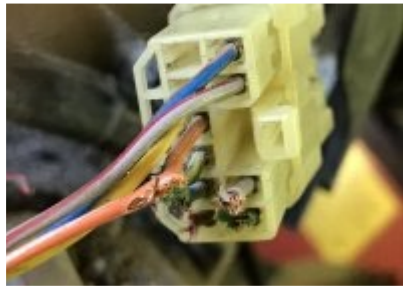
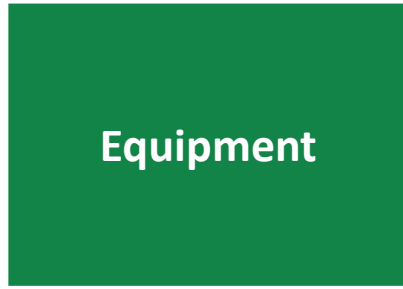
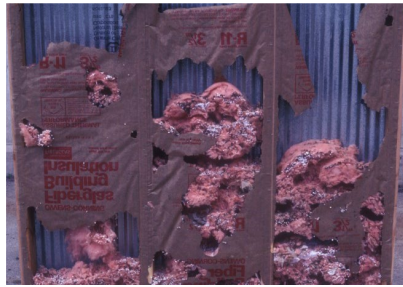
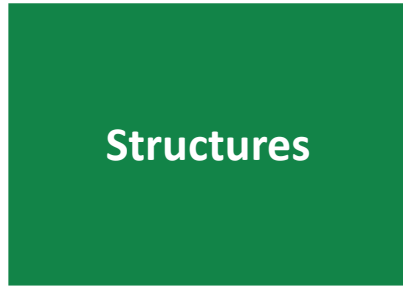
**It is important that all parties involved in a rodent situation understand rodent IPM.**



**Should not be first or default solution!**



# Rodent Issues in Maine Agriculture





# Rodent Issues in Maine Agriculture

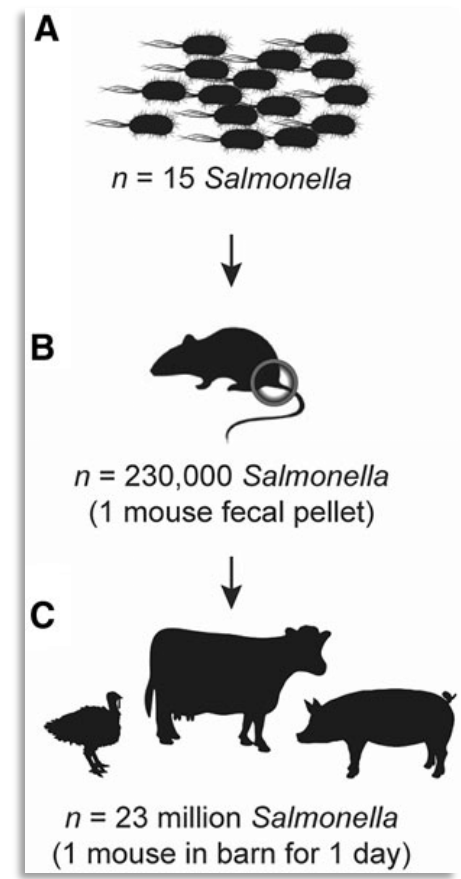


- 2018 – 23 illnesses
- 200 million eggs recalled due to salmonella
- Live and dead rodents in chicken houses and manure pits

**Table 1. Some Common Diseases of Poultry That Rodents May Harbor or Disseminate\***

Disease	Agent	Rodents Implicated
Bordetellosis	bacteria	rats
Leptospirosis	bacteria	rats, mice
Erysipelas	bacteria	rats
Salmonellosis	bacteria	mice, rats
Fowl Pox	virus	rats
Fowl Cholera	virus	rats, mice

\* Because rodents are capable of both mechanical and physiological transmission of various bacteria, viruses, and nematodes, the potential exists for rodents to transmit several other pathogens in poultry systems.





# Rodent Problems: Poultry Facilities and Barns

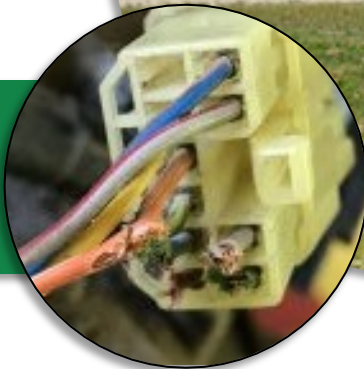
Can attract foxes,  
raccoons, and other  
chicken predators



Ideal rodent habitat – harborage,  
food, water



Gnaw on structural,  
mechanical, and  
electrical utilities



Consumes AND contaminates  
feed






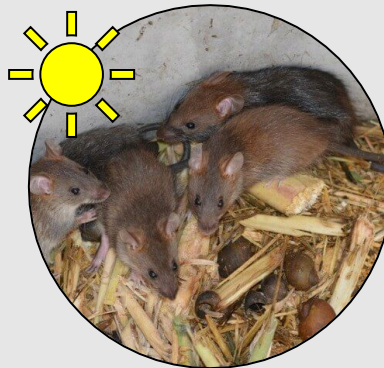


Prefers feed to baits

Weakens concrete slabs and  
walkways



# Rodent IPM in Maine Agriculture – Barns & Structures

 Identification	 Prevention & Cultural Control	 Monitoring & Record Keeping	 Action Thresholds	 Biological & Chemical Control
<p>Droppings, tunnels, gnawing marks, trails</p> <p>Damage to structures and electronics, sick animals, lost yields</p> <p>Features of trapped rodents or videos</p>	<p>Rodent proof with galvanized sheet metal, etc.</p> <p>Remove clutter and spilled feed, seal food/garbage, leaky faucets</p> <p>Trim trees/vegetation 3ft from walls and roofs</p>	<p>Work with client to develop a logbook and map, and consider trail cams</p> <p>Rodents are active just after dusk and shortly before dawn</p> <p>Consider a system of passive monitoring.</p>	<p><b>Daytime sightings mean there is already an established infestation!</b></p> 	<p><b>Some</b> evidence for attracting raptors (see next slide)</p> <p>Beware - Barn cats can bring in diseases from killed field animals.</p> <p>Ensure livestock cannot get to rodenticides if used.</p>

**Communication Ideas – Do a property walk with clients and point out areas of entry and attraction. Educate on rodent behavior and help them develop a system for monitoring and record keeping.**

# Biological Control: Encourage Raptors



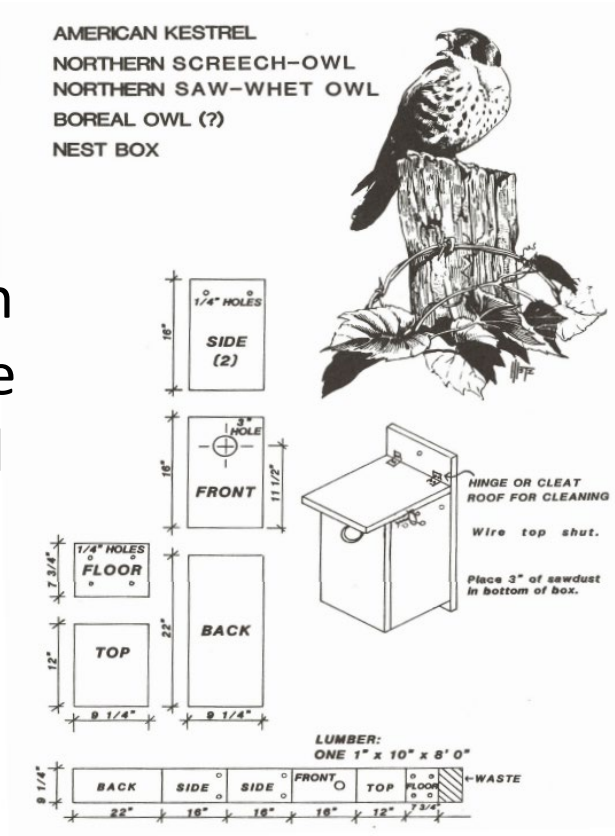
Care **MUST** be taken to not attract raptors to poisoned rodents. This method is incompatible with poison bait use. Be mindful of placement if insecticides will be sprayed nearby.



- **Attract Raptors** (hawks, owls, eagles) with nest boxes and perches
- **Monitoring & Maintenance** – keep nest boxes in good condition during **winter repairs** and ensure other birds are not using them. Wear gloves and a dust mask to avoid infection.



[UNH Extension Factsheet with Nesting Box and Perch Designs](#)



## IPM Concepts

- Identification
- Prevention & Cultural Control
- Monitoring & Record Keeping
- Action Thresholds
- Biological & Chemical Control

This does not constitute an endorsement or a recommendation by the State of Maine or the Board of Pesticides Control to use this product. Any products without an EPA registration number have not been reviewed or registered by the EPA. The label must be strictly followed.

Sources: [Oregon State Factsheet](#), [UNH Factsheet](#), [Woodworking for Wildlife](#); Photos: [Ichaney](#) (iNaturalist CC by 4.0)



# Rodent Problems: Crop Damage



Voles, mice, and rabbits girdle bark



Voles, mice, and rabbits girdle bark



Voles burrow, feed on tubers, expose to sunlight and freezing temps, predators dig & damage








# Rodent Problems: Crop Damage

Voles can end up harvested with the crop!  
Feed on tubers in storage for a potato feast...



Voles burrow, feed on tubers, expose to sunlight  
and freezing temps, predators dig & damage

# Rodent IPM in Maine Agriculture – Orchards & Fields

 Identification	 Prevention & Cultural Control	 Monitoring & Record Keeping	 Action Thresholds	 Biological & Chemical Control
<p>Look for droppings and runways connecting burrow openings, and predators digging for them</p> <p>More common to find damage near drainage ditches or woodlots</p>	<p>Manage yearly after harvest</p> <p>Mow grass closely in row middles and ditches late in the fall, and sanitize by cleaning dropped fruit.</p> <p>Use tree guards</p>	<p>Plan on monitoring and managing as soon as possible after harvest</p> <p>In berries, look for girdling on the base of canes and declining plant health</p>	<p>Survey for successful control using traps or fruit as a measuring metric before and after control*</p> <p><i>*see UNH factsheet</i></p>	<p>Mowing grass closely in row middles exposes rodents to predators</p> <p>Bait should be applied when dry weather predicted for three days and before snowfall</p>

**Communication Ideas – Ensure growers understand the different species of rodents, and how methods for control change depending on the species and the time of year.**



# Rodent Issues in Backyard Operations & Homesteading



Mice & Rats



Structures



Bird Feeders



Chipmunks & Squirrels



Backyard Pets



Long Term Food Storage



Voles



Tick Safety in Yards



Beekeeping



Woodchuck/ Groundhogs



Chicken Coops



Vegetable Gardens








Honorable Carnivore Mentions



Photos: [Mouse](#); [Rat](#); [Vole](#); [Rabbit](#); [Groundhog](#); [Structure Damage](#); [Poultry](#); [Raccoon](#); [Skunk](#); [Chipmunk](#); [Red Squirrel](#); [Damaged Tomato](#); [Bird Feeder](#); [Dog and Rat](#), [Food Jars](#); [Ticks on Mouse](#); [Damaged Bee Hive](#)

# Rodent IPM in Backyards – Growing Food







 Identification	 Prevention & Cultural Control	 Monitoring & Record Keeping	 Action Thresholds	 Biological & Chemical Control
<p>Chewed plants, large holes in leaves, missing entire parts of the plant, droppings, trails through vegetation, gnawed holes through structures, burrows around garden plants</p>	<p>Fencing around gardens (or specific plants) will exclude larger rodents and animals</p> <p>Keep paths trimmed low (just like in orchards!)</p> <p>Hunting possible for several species.</p>	<p>Scout for damaged plants and set traps baited with species-appropriate food.</p> <p>Check traps at least every 24 hours.</p>	<p>Consider traveling range – keeping resident population low <i>WILL</i> help!</p>	<p>Visual scare tactics (party balloons, etc.) and some taste repellents.</p>



**Communication Ideas – Neighborly conflicts often arise, understanding the species you are dealing with, what attracts it, and the home range can be helpful with these conversations.**



# Rodent IPM in Backyards – Beekeeping

 Identification	 Prevention & Cultural Control	 Monitoring & Record Keeping	 Action Thresholds	 Biological & Chemical Control
<p>Inspect <b>all</b> hives that have died.</p> <p>Mice: Nesting materials, urine, feces, chewed through comb.</p> <p>Shrews: Chew the wax to the foundation.</p>	<p>Elevate the entrance to hives or cover with a large mesh wire, use entrance reducers.</p> <p>Unused stored hives and materials should be stored closed to prevent creating harborage.</p>	<p>Inspect hives regularly (including peeking on warm winter days) and ensure to register through the <a href="#">Maine Apiary Program</a> in June!</p>	<p>Remove mice and potentially damaged frames at the first evidence of infestation.</p>	<p><b>Preferable to rely on prevention.</b></p> 

**Communication Ideas – Ask client if they are a registered beekeeper with the State of Maine; the State Apiarist provides inspections and educational materials that can help.**

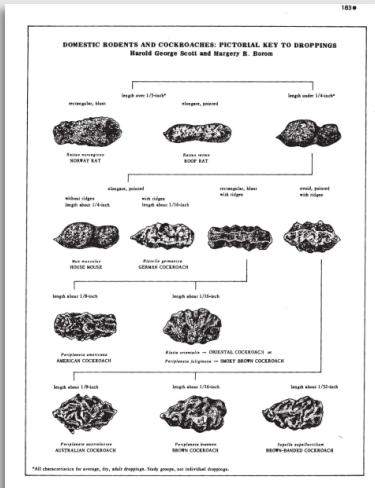


# Rodent IPM in Backyards - Chickens



## Identification

Look for rodent droppings, gnawing damage, and missing feed.



## Prevention & Cultural Control

Secure poultry in a predator-proof pen and electric fencing (raccoons)

Store food indoors in an animal-proof container, remove feed and eggs before night.

Raised floors!



## Monitoring & Record Keeping

If monitoring with traps, ensure the safety of the birds. Place traps under milk crates and in areas birds do not have access to.

Pre-bait for rats.



## Action Thresholds

**Begin control at any sign of rodent presence!**



## Biological & Chemical Control

Chickens can die from consuming rodenticides and consuming rodents which have died from anticoagulant rodenticides.



**Communication Ideas – Ensure that clients understand the importance of prevention and sanitation, especially as this can be a “hot button” issue amongst neighbors!**

# Rodent IPM in Backyards – Birdfeeders & Backyard Pets

- **Backyard Pets**

- Keep vaccinations up to date
- Do not feed pets outside, and do not feed feral cats.
- Keep pets inside overnight

- **Bird Feeders**

- Regularly clean bird seed off the ground & purchase squirrel-proof feeders
- Ensure squirrels cannot enter homes
- **Consider planting native plants instead**



# Rodent IPM in Schools & The Maine School IPM Program

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MAINE DEPARTMENT OF  
**AGRICULTURE  
CONSERVATION  
& FORESTRY**



# Maine's School Pesticide Regulations



## Chapter 27: STANDARDS FOR PESTICIDE APPLICATIONS AND PUBLIC NOTIFICATION IN SCHOOLS ([link](#))

**SUMMARY:** This rule establishes procedures and standards for applying pesticides in school buildings and on school grounds. This rule also sets forth the requirements for notifying school staff, students, visitors, parents and guardians about pending pesticide applications.

1 DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY  
26 BOARD OF PESTICIDES CONTROL  
Chapter 27: STANDARDS FOR PESTICIDE APPLICATIONS AND PUBLIC NOTIFICATION IN SCHOOLS

**SUMMARY:** This rule establishes procedures and standards for applying pesticides in school buildings and on school grounds. This rule also sets forth the requirements for notifying school staff, students, visitors, parents and guardians about pending pesticide applications.

### Section 1. Definitions

- A. **Integrated Pest Management.** For the purposes of this rule, Integrated Pest Management (IPM) means the selection, integration and implementation of pest damage prevention and control based on predicted socioeconomic and ecological consequences, including:
- (1) understanding the system in which the pest exists,
  - (2) establishing dynamic economic or aesthetic injury thresholds and determining whether the organism or organism complex warrants control,
  - (3) monitoring pests and natural enemies,
  - (4) when needed, selecting the appropriate system of cultural, mechanical, genetic, including resistant cultivars, biological or chemical prevention techniques or controls for desired suppression, and
  - (5) systematically evaluating the pest management approaches utilized.
- B. **School.** For the purposes of this rule, School means any public, private or tribally funded:
- (1) elementary school,
  - (2) secondary school,
  - (3) ...

# IPM is a Team Effort



**Maintenance Staff:**  
Pest exclusion and monitoring

**Contracted Pest Service:**  
Monitoring, control, communication

**Custodians:**  
Sanitation, monitoring pests, reporting

**Business Manager:**  
Contracts, budgeting

**IPM COORDINATOR:**  
Captain!

**Students, Nurse, and Teachers:**  
Education, sanitation, monitoring

**Food service director and staff:**  
Pest prevention and monitoring

**Office Staff:**  
Communication, records, scheduling

# The most common school kitchen pests...





# The most common school kitchen pests...

Can you find the hidden pest?





# The most common school kitchen pests...

**Cockroaches and mice use cardboard for hiding and nesting material**



# Pest friendly conditions:

Dirty floors around and behind equipment and furniture



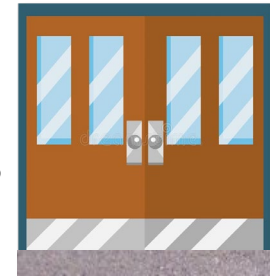
Dirty floor drains



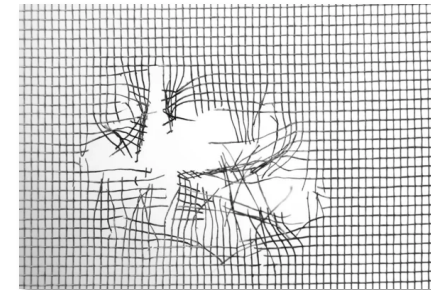
Condensation, leaking pipes, poor drainage and standing water



Gaps under exterior doors



Rips in window screens





# Examples: Pest Monitoring/IPM Actions Records



## Pest Management Activity Log Page 1—Monitoring/IPM

Use this page for monitoring and general IPM steps taken. Assign a unique number in the last column to reference to Page 2—Trap and Bait Station Monitoring or Page 3—Pesticide Application

Site Cobanacook Elementary (can be building, room, field, playground, etc)



	Date/ Time	Pest(s) or Evidence Seen/ Extent of Infestation	Specific Location (under sink, west goal soccer field, etc.)	By Whom	Company	IPM Steps Taken*	Ref. No. **
Pest Sighting #1	8:15am 11/09/2021	Ants entering through floor cracks	West wall of kitchen	Kitchen staff		Cleaned floors, sealed cracks with sealant, continued monitoring	CE 1
Pest Sighting #2	6:15am 06/17/2020	Hornet nest	Front entrance	Custodian B. Stinger		Sprayed with hornet spray before school opened in morning	CE 2
Pest Sighting #3	10:00am 12/02/2022	Mouse droppings	Classroom 9	Teacher Snaxalot reported, custodian Stacalm cleaned and set traps		Cleaned up with disinfectant wipes, set traps, instructed teacher to seal snacks in airtight container	CE 3

# Examples: Pest Monitoring/IPM Actions Records



## Pest Sighting # 3



### Pest Management Activity Log Page 2—Trap and Bait Station Monitoring

Use this page when Traps and Bait Stations are used. The Reference number should connect to the last column on Page 1—Monitoring/IPM.

Site \_\_\_\_\_ (can be building, room, field, playground, etc)

Ref. #	Trap Type	Room # or Name	Location Description	Date Trap Checked	Trap Missing?	# of Specimens
CE 3	Snap trap	Classroom 9	Behind storage cabinet	12/03/2022		1 mouse
CE 3	Snap trap	Classroom 9	Behind storage cabinet	12/04/2022		0

# IPM is NOT...

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**NOT** ...preventative pesticide use

**NOT** ...using only natural pesticides  
(natural pesticides are still registered and regulated as pesticides in Maine)

**NOT** ...waiting for pest problems to occur

**NOT** ...leaving all pest-related issues to the contracted pest service





# IPM is a Team Effort



**Maintenance Staff:**  
Pest exclusion and monitoring

**Contracted Pest Service:**  
Monitoring, control, communication

**Custodians:**  
Sanitation, monitoring pests, reporting

**Business Manager:**  
Contracts, budgeting

**IPM COORDINATOR:**  
Captain!

**Students, Nurse, and Teachers:**  
Education, sanitation, monitoring

**Food service director and staff:**  
Pest prevention and monitoring

**Office Staff:**  
Communication, records, scheduling



# Questions?

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