



**5 FOCUS  
AREAS**  
for implementing  
successful strategies  
in schools

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# Reading, Writing, **RODENTS?**

**R**odent infestations in schools pose three significant threats. There are health hazards from allergens and from disease transmission, such as hantavirus, salmonellosis and leptospirosis. Second, there can be costly structural damage related to electric, plumbing and insulation systems from gnawing. Last, but not least, the rodents' rapid proliferation leads to widespread problems.

Beyond tangible risks, rodent infestations harm school reputations and operations, potentially forcing closures. Schools are uniquely vulnerable thanks to food sources and

harborage. Challenges to rodent control in schools include prioritizing student safety and thus limiting chemical use, as well as tight budgets, scheduling difficulties and the need for legal compliance and public scrutiny.

An integrated pest management (IPM) approach addresses these challenges through the following five tasks:

## **1** Assessment

Every school site requires a custom plan, which begins when the pest management professional (PMP) gathers data on existing rodent pressure. The resulting initial assessment not only tracks and locates pest activity

but also ensures the corrective actions directly match the specific responsibilities of everyone involved in the IPM program. Key assessment elements include:

► **Proper species identification** ensures success for the entire IPM program. PMPs must interview staff to collect details about previous treatments and known infestations to establish a comprehensive look at the situation at hand.

On p. 34, Table 1 (adapted from Brown, 1960) summarizes distinguishing traits such as weight, total length, tail proportion and ear size for the three primary commensal rodent species. Fig. 1, opposite page, offers a practical visual guide. Together, they can help

## Rodents by SEASON

Rodent activity varies seasonally, so inspection priorities should adjust accordingly:

- **Winter (December, January, February)** — Rodents remain active indoors, so continued trap monitoring and inspection of pest-vulnerable areas is critical.
- **Spring (March, April, May)** — Outdoor breeding activity begins, requiring attention to dumpsters, landscaped areas and roof or attic spaces.
- **Summer (June, July, August)** — Outdoor populations increase, emphasizing sanitation, vegetation maintenance and strategic placement of exterior traps.
- **Fall (September, October, November)** — Indoor invasions peak, making it essential to seal gaps, inspect door sweeps and monitor traps. — M.E.

enable PMPs and school facility staff quickly distinguish among house mice, Norway rats and roof rats.

This knowledge allows PMPs to create targeted, effective corrective actions tailored to each species' characteristics. See "Biology and behavior of common commensal rodents," p. 37.

► **Systematic inspections** involve carefully scrutinizing the environment for signs of rodent activity, identifying all potential entry points and pinpointing vulnerable areas. By implementing regular, routine checks guided by a comprehensive checklist, PMPs can guarantee early detection and deploy immediate, targeted control measures.

School inspections should follow a structured calendar: monthly checks for high-traffic areas such as kitchens, cafeterias, classrooms, lounges, custodial closets, basements, dumpsters and loading docks; quarterly inspections for roof voids, attics, suspended ceilings, locker rooms, gyms, boiler rooms, utility chases and athletic fields; and an annual review to assess historical activity, update trap schematics and adjust service frequency. See "Rodents by season," above right.

Typical rodent hotspots include kitchens, cafeterias, vending machines, storage rooms, classrooms, locker rooms, gyms, mechanical rooms, basements, utility chases, ceiling voids, attics, exterior dumpsters, foundation plantings, playgrounds and athletic fields near fences. Norway rats, in particular, may enter from sewers or dig burrows from the exterior. Best practices for inspection include:

- Examine both indoor and outdoor environments for droppings, gnaw marks, runways, burrows, odors and sounds.
- Prioritize pest-vulnerable areas and check for structural vulnerabilities, including gaps,

cracks, broken windows, compromised vents and floor drains.

- Use specialized tools to aid detection, such as flashlights to illuminate dark areas; ultraviolet (UV) lights to reveal urine, droppings and rub marks; dust tracking to highlight rodent runways; thermal cameras to detect rodent body heat; and borescopes to inspect inside walls, ceilings and tight spaces.
- Inspect and maintain door sweeps and weather stripping quarterly, replacing damaged or worn components.
- Document findings using checklists to ensure all rodent hotspots are monitored consistently.

### Ongoing monitoring

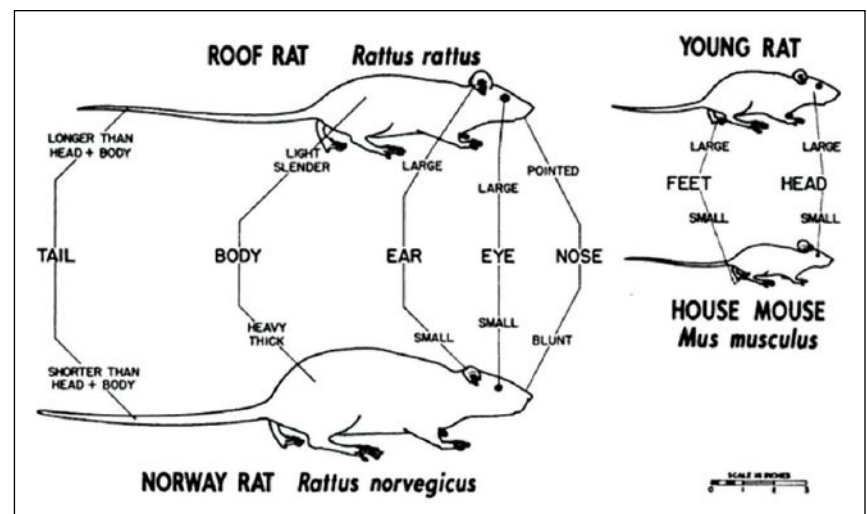
Monitoring is essential for tracking rodent activity, evaluating control measures and guiding timely interventions. It relies on systematic checks, data collection and the use of technology to detect activity early and accurately. Key monitoring best practices include:

- Check traps and bait stations regularly and record captures. The frequency depends on the level of site risk — daily, weekly or as needed.

- Record locations, dates, rodent types and actions taken to maintain a clear history.
- Use a standardized zero-to-5 scale to measure severity and trends over time.
- When recording signs of activity, include when, where

*Continued on page 34*

**FIG. 1. Field identification of commensal rodents.\***



\* Information adapted from Brown, R.Z. (1960). "Biological factors in domestic rodent control (No. 773)." US Communicable Disease Center

**TABLE 1. Key characteristics of common commensal rodents\***

SPECIES	WEIGHT	TOTAL LENGTH (nose to tip of tail)	HEAD AND BODY	TAIL	EARS	HIND FOOT
Norway rat ( <i>Rattus norvegicus</i> )	10-17 ounces	12.75-18 inches	Blunt muzzle; heavy, thick body; 7-10 inches	Shorter than head plus body; carried with less movement than roof rat; lighter-colored underside; 6-8.5 inches	Small, close-set; appear half-buried in fur; rarely over 0.75 of an inch	Usually more than 1-1.5 inches from heel to tip of longest toe
Roof rat ( <i>R. rattus</i> )	4-12 ounces	13.75-17.75 inches	Pointed muzzle; slender body; 6.5-8 inches	Longer than head plus body; generally whip-like; uniform coloring top/bottom; 7.5-10 inches	Large, prominent; stand well out from fur; generally over 0.75 of an inch	Generally less than 1-1.5 inches from heel to tip of longest toe
House mouse ( <i>Mus musculus</i> )	0.5-0.75 ounce	6-7.5 inches	Small, 2.5-3.5 inches	Equal to or slightly longer than head plus body; 3-4 inches	Prominent, large for size of animal; 0.5 of an inch or less	Feet are shorter, darker and broader than most wild mice; generally less than 0.75 of an inch from heel to tip of longest toe

**TABLE 2. Roles, responsibilities, reporting and action thresholds for school rodent management**

ROLE	KEY RESPONSIBILITIES	REPORTING / FREQUENCY	ACTION THRESHOLDS	NOTES / BEST PRACTICES
<b>Pest management professional (PMP)</b>	Inspect, trap, monitor, document, provide checklists, train staff, recommend corrective actions	Inspection reports immediately after inspection; trend analysis monthly, quarterly, annually	<ul style="list-style-type: none"> <li>• Single sighting/droppings: Document, trap, monitor, increase inspections</li> <li>• Multiple sightings/breeding signs: Immediate elimination, exclusion, increased trap monitoring</li> <li>• No activity for 3 months: Remove supplemental traps, continue monitoring</li> </ul>	Immediate reports inform staff; trend analysis guides program adjustments; must be aligned with school staff and administration
<b>School staff</b>	Maintain sanitation, reduce clutter, inspect door sweeps, report sightings, assist with habitat modification	Daily/weekly tasks; report sightings immediately	See above thresholds; report all signs immediately to PMP	Staff buy-in ensures timely reporting and proper sanitation; alignment with PMP reduces gaps in coverage
<b>Foodservice staff</b>	Seal food, clean spills, monitor kitchens, assist with pest-vulnerable areas	Daily inspection/reporting; participate in monthly/quarterly review	Same thresholds; any sightings trigger immediate reporting	Coordination ensures high-risk food areas are monitored; staff understand their roles in prevention
<b>Administrators</b>	Support integrated pest management (IPM) program, allocate resources, approve schedules, maintain logs, ensure compliance	Review monthly/quarterly/annual trend reports	Support enforcement of thresholds; ensure corrective actions are completed	Clear understanding of program responsibilities ensures accountability, resource allocation and rapid decision-making

Continued from page 33 and how many droppings, gnaw marks, rub marks, nests and burrows.

- ▶ Deploy remote monitoring devices in hard-to-reach areas such as ceilings, wall voids and utility chases. You can use them in more public areas for after-hours monitoring to detect early activity.
- ▶ Ensure all traps and devices are tamper-resistant and inaccessible to students, staff and pets.

- ▶ Enhance detection with UV lights, thermal cameras and remote sensors for efficient monitoring.
- ▶ Set action triggers. Use collected data and activity thresholds to guide additional control measures.
- ▶ Share results with school staff and facility managers regularly to support accountability and informed decision-making.

**2 Elimination**  
Eliminating rodents in schools

requires a multi-pronged approach that prioritizes safety, long-term control and effectiveness. This includes trapping with snap traps, multi-catch traps, glue boards and, when necessary, the appropriate use of rodenticides in secure, tamper-resistant stations. Best practices for rodent treatment include:



- ▶ **Outdoor use is preferred.** Place rodenticides in secure, tamper-resistant bait stations along exterior

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# INSTANTLY IDENTIFY CAPTURES



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foundations to protect students, staff and non-target animals.

▶ **Restrict indoor use.** If necessary, use only in tamper-resistant stations located in areas inaccessible to students and staff, such as cabinets (locked), crawlspaces or behind equipment.

▶ **Place materials strategically.** Position

traps and bait stations near fresh droppings, rub marks and active runways. Find spots along walls, in corners, behind appliances or in undisturbed areas to maximize effectiveness and safety.

**3 Coordination** Effective rodent management requires alignment, shared

responsibilities and agreed-upon actions. Table 2, p. 34, provides a framework showing who does what and when, and what triggers specific actions. This is an example framework, of course — all roles, responsibilities and thresholds must be agreed upon and formally accepted by stakeholders to ensure transparency, accountability and rapid outcomes.

**4 Keeping records** Accurate record-keeping is essential for effective rodent management, enabling trend analysis, accountability and informed decision-making. Key practices include:

- ▶ Maintain detailed records of captures by date and location.
- ▶ Document the placement of traps, bait stations and monitoring devices for future reference and adjustments.
- ▶ Record observations of rodent activity, environmental conditions and any corrective actions taken.
- ▶ Track communication with school staff and assign responsibilities to ensure follow-up actions are completed.

**5 Prevention** Prevention focuses on eliminating rodent access, food, and shelter to reduce the risk of infestations through three strategies:

**Exclusion**

- ▶ Seal gaps that are 0.25 of an inch or above with concrete, sheet metal or hardware cloth.
- ▶ Inspect and maintain door sweeps and weather-stripping.
- ▶ Repair broken windows, doors and screens; seal vents and floor drains.

**Sanitation**

- ▶ Rodent-proof food storage and clean spills promptly.
- ▶ Empty trash daily and keep dumpsters at least 75 feet away from building entrances.

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#### Habitat modification

- ▶ Trim shrubs and trees and maintain a gravel strip along building foundations.
- ▶ Remove climbing plants and vines that provide access.
- ▶ Repair leaks and eliminate standing water to remove moisture sources. **PMP**



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## BIOLOGY AND BEHAVIOR *of common commensal rodents*

**House mice (*Mus musculus*)** originated in Central Asia and are now among the most widespread mammals worldwide, found on every continent except Antarctica.<sup>1,2,3</sup> Adults weigh between 0.4 and 0.9 of an ounce, with a head and body length of between 2.5 and 3.75 inches. They are curious, adaptable and can pass through openings as small as 0.25 of an inch.<sup>2,4</sup>

Females produce between five and 10 litters annually, with a gestation of 18 to 21 days. Their young reach maturity in about six weeks.<sup>2</sup> Their diet is omnivorous, but they prefer seeds and grains, often contaminating food far beyond what they consume.

**Norway rats (*Rattus norvegicus*)**, also known as brown rats, likely originated in northern China and spread globally via trade.<sup>5,6</sup> Adults weigh 7 to 18 ounces, with blunt snouts, small ears and tails shorter than their heads and bodies. They are burrowers and strong swimmers, often living in sewers, foundations and basements.<sup>7,8</sup>

Reproduction is prolific, with three to 12 litters annually and between six and 14 pups per litter, after a 21-day gestation.<sup>6,7</sup> Norway rats are neophobic and omnivorous, feeding on grains, meat, fish and garbage. They often store food in burrows.

**Roof rats (*R. rattus*)**, also known as black rats, originated in Asia and spread worldwide on sailing

ships.<sup>9</sup> Adults weigh between four and 12 ounces, with pointed muzzles, large ears and tails longer than their heads and bodies. These agile climbers inhabit attics, rafters, trees and dense vegetation, rarely burrowing.<sup>7,10</sup>

Roof rats breed year-round in warm climates, peaking in spring and fall. Females average four to six litters annually, with five to eight pups after a 21- to 23-day gestation.<sup>10</sup> Their diet is omnivorous, but favors fruits, nuts and seeds, often contaminating food storage. — *M.E.*

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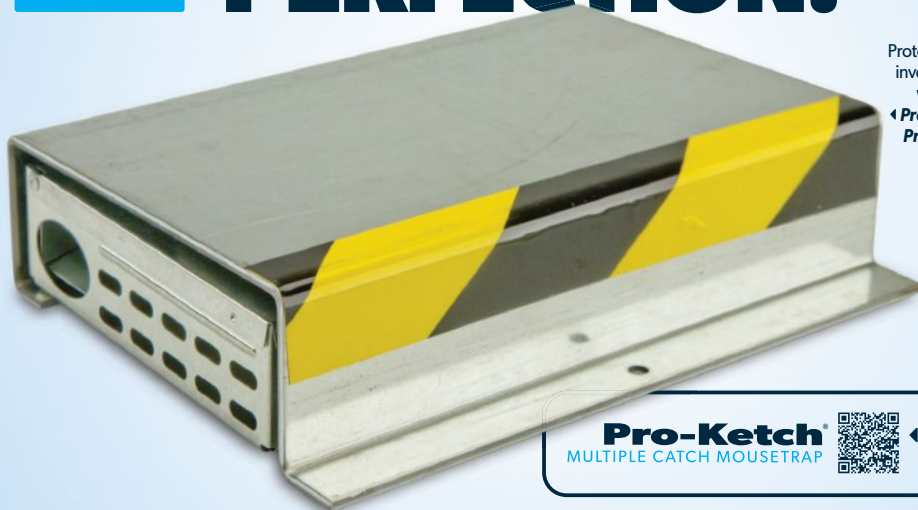
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