INTEGRATED PEST MANAGEMENT

Insights

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Integrated Pest Management

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Insights

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Inside

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Canada Geese: The Bird Control Challenge of the Decade

By Marcia Anderson, PhD, U.S. EPA

When summer is here, so are the geese. Are Canada geese a problem in your neighborhood, farm, park, or ball field?

We know that Canada geese readily adapt to habitats in urban and suburban areas. Although a few geese may be desirable in a park, pond, or back yard, a small gaggle can increase rapidly and become difficult to manage. According to numerous state agencies and the Federal Aviation Administration, geese also pose some of the greatest bird-control challenges of this decade.

Numerous Canada geese taking over the Rutgers University agriculture fields. Photo: M. Anderson, U.S. EPA

The Trouble with Geese

Geese are a nuisance due to the accumulation of their droppings and feathers, their trampling and overgrazing of grass (which creates large dead spots), and their aggressive behavior and noise.

At times, they can represent a serious risk to human health and safety. Heavy concentrations of goose droppings also contain a large amount of nitrogen, which can lead to excessive algal growth and reduced water quality in ponds and lakes.

Keys to Successful Management

While there's no one-size-fits-all solution that can be used universally to reduce environmental and human/goose conflicts, an integrated pest management (IPM) approach that uses several techniques in combination can help successfully manage Canada geese.

Identifying the site characteristics that are most attractive to the geese—and altering that habitat—is a good first step.

> Geese are a nuisance, and at times, they can represent a serious risk to human health and safety.

Most sites with goose problems are characterized by a large, unobstructed lawn next to a body of water; this can include parks, golf courses, planned residential communities, and more. These areas provide geese with everything they need to thrive: access to food, water, and an avenue of escape from predators, creating a goose paradise.

Strategies to manage these geese can include some or all of the following.

Modifying Habitats to Make Them Less Goose Friendly

An effective solution for reducing geese in these areas is to modify the habitat by reducing the lawn or adding impediments at the shoreline.

If fields must be near the water's edge, creating vegetative barriers such as shrubs or hedges can obstruct the geese's line of sight. This is important for two

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Geese

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reasons: it makes the area less attractive because of the potential for attack from predators, and it blocks their preferred pathways to and from the water by shortening/obscuring their flight-landing runway.

Fence barriers can prevent geese from walking from water to grazing areas. Regardless of the fencing material, openings should be no larger than three inches by three inches wide and the fence should be at least three feet tall. It should be long enough to discourage the geese from walking around the ends.

> Most sites with goose problems are characterized by a large, unobstructed lawn next to a body of water.

Geese along an unobstructed waterfront. Photo: John Brighenti, flic.kr/p/2maCmu9, CC BY 2.0

Plants should also be at least three feet tall to prevent adult geese from seeing over them, and dense enough to prevent the geese from walking through them.

The shrubs can be intermittently planted with tall grasses or wildflowers for visual effect. These also help to fill in planting gaps where young shrubs are still maturing. Tall trees with a dense canopy may also prevent geese from landing if located in the flight paths between water and grassy areas.

Adding boulders—at least two feet in diameter—every few yards may also reduce an area's attractiveness to geese and create modest barriers for goose take-offs and landings.

Altering Grazing Preferences

Targeted Planting and Mowing Techniques

Canada geese prefer to eat young Kentucky bluegrass shoots that are found in abundance on mowed lawns. Planting varieties that are less palatable to geese, like tall fescue, will lessen the grasses' appeal.

In some areas, just reducing the frequency of mowing and allowing the grass to grow to six inches will reduce the abundance of young, tender shoots.

Also, by reducing mowing, the need for fertilizer is reduced. And because geese prefer fertilized plants over unfertilized ones, this will further decrease an area's attractiveness as a feeding ground.

Where possible, ground covers that Canada geese dislike—such as periwinkle, myrtle, pachysandra, and hosta—should be planted.

Strategic Placement of Paths and Trails

In pedestrian parks, jogging or walking paths should be placed near the water to make the area less attractive to the geese for feeding, nesting, and socializing.

Serpentine footpaths, along with extensive plantings, prevent the geese from having a direct line of sight through the planted area, yet still provide shoreline access for people.

Adding a simple gate that will automatically close behind a pedestrian will also go a long way to deter geese from approaching the human footpath.

Don't Feed the Wildlife!

Feeding geese is a major cause of high urban bird populations. Feeding waterfowl encourages them to congregate and may make the geese more aggressive toward people.

Canada geese are grazers and do not need handouts to exist. Signage discouraging people from feeding wildlife is important.

Employing Harassment Techniques

Harassment techniques can also be effective in reducing Canada goose problems.

Radio-controlled aircraft, boats, and cars have been used successfully to scare off geese, but they are both labor intensive and expensive.

Geese enjoying their preferred bluegrass meal in an industrial area. Photo: M. Anderson, U.S. EPA

Canada Geese migrating in their characteristic "V" formation. Photo: M. Anderson, U.S. EPA

Trained dogs, when directed by a handler, have been effective at keeping golf courses and other large properties free of geese. It is important to note that federal wildlife laws state that the geese cannot be touched, harmed, or handled by a person or a trained dog, other than in specifically regulated instances discussed later in this article.

Loud noises and nonlethal scaring devices that are designed to frighten geese away from problem sites can be effective in the short term, but urban geese can quickly become accustomed to measures such as sirens, air horns, whistles, firecrackers, and ultrasonic devices, and will return to their normal routines once the noise stops.

Chemical repellents can be applied to make grass unpalatable to geese. Many are made from a naturally occurring, nontoxic, biodegradable food ingredient called methyl anthranilate. It should be applied only in areas away from fish-bearing waters, as it may adversely affect fish.

Lethal Controls

Other than the usual methods of habitat control, visual deterrents, exclusion, and repellents, other goose IPM methods include dogs, hunting, roundups, and egg treatments (Curtis and Braband 2022).

Lethal control techniques for geese used outside of legal hunting seasons require federal and state permits.

Hunting is effective at reducing goose populations. All hunting requires a valid state hunting license, and many states require a federal waterfowl hunting stamp or special-purpose kill permit. Hunting may occur only in areas open to waterfowl hunting during prescribed seasons.

Roundups are another goose-population-reduction method. Canada geese are easily captured during the molt, driven into nets and then hand captured (Pakulak and Schmidt 1970). Juveniles are removed.

After trapping, problem geese may be translocated live, or humanely euthanized and sent to a poultry processor where the meat is deemed safe for consumption. Often, the resulting goose meat is donated to the local food bank.

> Problems with resident geese are likely to increase in part because of our inadvertent creation of favorable breeding habitats.

Need-Driven, Multifaceted Solutions

Nuisance complaints from city parks, golf courses, and housing developments that augment the bird hazard to aircraft operations at local airports triggered a multi-agency task force (USDA, APHIS, ADC) to develop and implement an IPM plan.

The plan identified both short-term lethal and nonlethal control alternatives (Fairaizi 1992). The integrated use of limited lethal (including hunting) and nonlethal control methods directly benefited the goose population by reducing the need for population reduction, and it benefited human interests by reducing the threat of goose/aircraft collisions.

Some people suggest relocation, but relocating geese is both expensive and often ineffective because they have strong homing instincts and most return to their former nesting area (Cooper 1978). Capturing and transporting Canada geese requires federal and state permits, trained personnel, and specialized equipment.

Problems with resident geese are likely to increase because of low mortality of adult birds and our inadvertent creation of favorable breeding habitats. Taking an IPM approach that combines several techniques, includes community input, and exercises persistence in their implementation, will allow you to effectively manage the geese in your area.

Further Reading

For more information on IPM and pest-control techniques from the EPA, visit www.epa.gov/safepestcontrol/integrated-pest-management-ipm-principles.

Resources

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NY DEC, www.dec.ny.gov/animals/7003.html. In urban and suburban areas throughout New York State, expanses of short grass, abundant lakes and ponds, lack of natural predators, limited hunting, and supplemental feeding have created an explosion in resident goose numbers. While most people find a few geese acceptable, problems develop as local flocks grow.

Study: Improving Pest Management in Multifamily Housing

By Susannah Krysko, MS, StopPests in Housing Program Manager

The COVID-19 pandemic and ensuing efforts to recover have brought unique challenges to society, with some ramifications yet to be fully realized.

Pandemic-related interruptions in services included a reduction or cessation of pest-management inspections and treatments in multifamily housing, creating an opportunity for pest activity and infestations to grow. Pest resurgence in low-income housing—particularly those properties managed by public housing agencies (PHAs)—are of particular concern.

Now that services are resuming, building managers and pest-control professionals are left catching up and, in some cases, struggling to get pests under control in multifamily housing.

Even prior to COVID, there were relatively low expectations for pest-management success in PHAs. That, combined with pandemic-induced interruptions, have resulted in lasting implications in low-income and public housing.

> Pandemic-related interruptions included a reduction or cessation of pest-management inspections and treatments in multifamily housing, creating an opportunity for pest activity and infestations to grow.

Challenge Begets Opportunity

Stephen Kells, PhD, an entomologist at the University of Minnesota, recognized the opportunity to rethink pest control and develop a new system of approaching pest management for multifamily housing.

Sticky traps and bed bug interceptors can help assess pest control efforts. Photo: S. Krysko

A technician installs a bed bug cover on a mattress. Photo: StopPests in Housing Program

Kells received a subaward through the StopPests in Housing Program, which is administered by the Northeastern Integrated Pest Management (IPM) Center through a contract with the Office of Lead Hazard Control and Healthy Homes at the Department of Housing and Urban Development (HUD).

Kells uses data analysis to map out a pest-control plan that allows for constant assessment and improvement of pest-control practices.

How Traditional Approaches Come Up Short

Without periodic assessments, it's easy to remain complacent with the status quo, where there's no expectation of progress in reducing overall pest populations. Traditionally, pest-control efforts in multifamily housing have followed a typical cycle:

1. Complaint from a single unit within a building
2. Response with various treatment options on that unit
3. Wait until next complaint or detection
4. Additional responses

This cycle becomes an infinite loop because crucial steps are often missing:

- Evaluating the whole building, not just individual affected units
- Designing a control strategy based on knowledge of pest biology and habitats in the structure
- Using pre- and post-treatment assessment of pest activity to refine control procedures
- Scheduling critical preventative actions
- Ensuring effective communication between facility managers and residents
- Monitoring costs for budgetary efficiencies

Resident education programs are aimed at increasing residents' awareness of pests and signs of their presence. Photo: StopPests in Housing Program

Because of these omissions, there is ongoing frustration experienced by residents, staff, and management alike, as well as substantial costs from pest-management practices that fail to stop chronic problems.

> Without periodic assessments, it's easy to remain complacent with the status quo, where there's no expectation of progress in reducing overall pest populations.

Breaking the Cycle: Using Data to Guide Decisions

To find an efficient solution that could be adopted by other agencies, Kells analyzed pest-management data across 42 high-rises and developments of the Minneapolis Public Housing Authority (MPHA, representing some 5,500 apartments) to make decisions about resource allocation.

The goal of this study was to learn how to provide consistency of service and early detection, and to use data to prioritize, plan, and test with pilot programs. The University of Minnesota provided data analysis, staff training, in-field observations, monitor setup, annual assessments, and monthly discussions with in-house pest-management staff and managers from the MPHA.

Study Findings

Communication and Thoroughness

The first finding was the need for improvement in communication and expectations for a successful pest-management program throughout the organization.

Communication must be across all levels of the organization, from the pest-management technicians all the way up to the chief operating officer, executive director, or upper-level management. To improve IPM practices, an organization should first look at their system of communication at all levels and ensure feedback from the technicians is incorporated.

MPHA data going back to 2009 was analyzed and revealed that 67 to 82 percent of the pest-control work orders were from 11 to 16 percent of the apartments, meaning that the majority of resources were going to a relatively small number of apartments with chronic infestations and repeat pest services. (Chronic infestations were defined as those that needed more than two treatments annually.)

Once they determined that the pest-control treatments in these chronic apartments were not sufficiently thorough, they looked at how time and attention could be increased in those units for more effective control. If time and resources were spent upfront, fewer repeat visits were needed.

They first communicated to the technicians that the expectation was delivery of effective control in one service visit. Although follow-up visits are always needed in pest control, it set the expectation that the treatment would be thorough. Technicians, in turn, stated they could do this only if given fewer work orders per day. They also often need extra help and supplies.

This underscores the vital need for effective communication up and down organizational levels.

When technicians think pest infestations are the "residents' fault," the level of service declines because they can become frustrated or complacent. Sanitation helps, but it is not imperative; nonetheless, it is often used as an excuse for not achieving pest elimination. As such, technicians were expected to provide thorough service and eliminate infestations regardless of cooperation by residents.

Once the work-order service times were increased, more thorough control was achieved, and less time was needed for repeat infestation treatments. Eventually, more time was devoted to other IPM measures, including preventative treatments like exclusion and inspections.

Infestations Don't Occur in Isolation

The study found inspections can be streamlined if infestations are mapped across a building.

Mice, cockroaches, and bed bugs are often found aggregated in apartment clusters. If inspections occur only in the apartments of residents reporting pests, technicians will miss likely infestations in neighboring units.

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Turkey Vultures: An Asset to an IPM Approach and “Nature’s Roadkill Clean-Up Crew”

By Marcia Anderson, PhD, U.S. EPA

Turkey vultures can often be seen along roadsides feeding on roadkill, near bodies of water feeding on washed-up fish or turtles, or even at landfills picking through waste.

They do not kill live animals, as they have little to no hunting ability due to their dull and weak talons. However, they make up for that with their superior sense of smell, which can detect dead animals from miles away. They feed almost exclusively on carrion, playing an important role in the ecosystem by disposing of dead animals, which reduces the spread of disease.

The vultures prefer freshly deceased animals but will often wait for their meal to soften through some decomposition to facilitate piercing the carcass skin. They avoid carcasses that have reached the point of putrefaction.

Nature’s Recyclers and Sanitizers

While vultures don’t share the conventional good looks of eagles or osprey, the ecosystem services they provide are irreplaceable. They compete with—and control—populations of rats, feral dogs, blowflies, and other scavengers, many of which are disease vectors. They ultimately make the world cleaner and healthier.

How do turkey vultures contribute to pest management? Sanitation is an integral part of integrated pest management (IPM), and turkey vultures are a key natural factor in sanitation along roadways and rights of way, on beaches, and in parks and other locations. They clean up dead carcasses that draw pests and vermin looking for a free meal and help keep our environment clean by decreasing unwanted pests and reducing the spread of disease.

A century ago, turkey vultures were unfamiliar in Massachusetts, Connecticut, and other northeastern states. Nowadays, they are sighted quite often. Why? Thanks to our modern interstate highway system, they have moved north, following the trail of roadkill carcasses all the way up to southern Canada. Turkey vultures have become honorary Department of Transportation road crews, reducing the amount of carrion that needs to be removed.

> Turkey vultures are a key natural factor in sanitation, an integral part of IPM.

Advantageous Adaptations

Turkey vultures find food using their keen eyesight and sense of smell, flying low enough to the ground to detect the gases produced by the beginning processes of decay in dead animals. Their nostrils can detect potential meals for miles around, even below the forest canopy, an ability that is otherwise uncommon in the avian world.

Turkey vultures have such a superior sense of smell that black vultures often rely on them to detect the food; the black vultures simply follow suit and share the meal, cleaning up the countryside one bite at a time.

Even their bodies are built for scavenging. Do you know why the turkey vulture’s neck is bare? It is a matter of hygiene. Feathers would only get in the way, befouled by their food.

It is known that all vultures have excellent immune systems; they happily feast on carcasses without contracting botulism, anthrax, cholera, or salmonella. However, through bioaccumulation, vultures may fall victim to pesticides, lead, or other toxins from the dead animals that they eat.

A Bird’s-Eye View

You have probably heard the saying, “The early bird catches the worm.” That phrase does not pertain to the turkey vulture, a late riser. In flight, they use thermals to move through the air, but because the updrafts usually do not kick in until noon (after the sun has heated things up), turkey vultures can be seen in the morning, standing erect on a perch with wings spread in the sun, presumably warming up.

> Vultures’ immune systems allow them to feast on carcasses without contracting typical pathogens. However, through bioaccumulation, they may fall victim to pesticides, lead, or other toxins from the dead animals they eat.

It requires a great deal of effort for turkey vultures to take flight. They hop on their feet and flap their wings while pushing off the ground. Once they are in the sky, however, they will stay aloft for hours, gracefully taking advantage of rising thermal air currents.

If you spot one and want to see more, just wait. They tend to travel in groups of six, and when one finds a carcass, they all feast.

Often mistaken in flight for eagles, turkey vultures soar with their wings raised in a “V”, making wobbly circles, and teetering back and forth as they soar. They will soar up to six hours without flapping their wings, unlike black vultures, which flap their wings much more frequently and soar with their wings held almost flat.

Turkey vultures inhabit a similar geographic range to black vultures, from southern Canada and the eastern U.S. all the way down to Cape Horn in South America.

Threats and Protections

The turkey vulture has very few natural predators, and due to its value as an environmentally beneficial species, it receives special legal protections under the U.S. Migratory Bird Treaty Act of 1918. It is illegal to take, kill, or possess turkey vultures, with violations punishable by fines of up to $15,000 and imprisonment of up to six months.

Black vultures inspecting a sea turtle carcass on a Florida beach. Photo: M. Anderson, U.S. EPA

Before the 1980s, turkey vultures were threatened by the side-effects of the insecticide dichlorodiphenyltrichloroethane (DDT), but their numbers have recovered and now they are among the most common large birds in North America.

Unexpected Climate Benefits

The natural function of turkey vultures not only prevents disease spread that can occur through the decomposition of carcasses, but they also reduce greenhouse-gas emissions when compared to replacing their ecosystem services with trucks transporting carcasses to processing facilities.

A study conducted in Spain (home to 95% of European vultures), and documented in *Nature: Science Report*, 2015, has shown that replacing the natural carcass disposal service provided by vultures with vehicle transport to processing plants would result in the equivalent of an additional 77,344 metric tons of CO_2 emissions and U.S. $50M of additional payments to insurance companies each year.

Thus, replacing the ecosystem services provided by scavengers has not only conservation costs, but also important and unnecessary environmental and economic ones as well (Morales-Reyes, Z. et al. Supplanting ecosystem services provided by scavengers raise greenhouse gas emissions. *Sci. Rep.* 5, 7811; DOI:10.1038/srep07811 (2015)).

> Turkey vultures not only prevent disease spread, but they also reduce greenhouse gas emissions when compared to artificial alternatives.

Comparing the feathers of turkey and black vultures while overlooking a Florida beach. Photo: M. Anderson, U.S. EPA

Unsung Ecosystem Heroes

Casual observers may be unaware of the benefits we all enjoy from having turkey vultures cruising above our highways and over our farms and beaches and open spaces.

The vultures help to keep our environment free from potentially hazardous, sometimes diseased carrion, cleaning it up to save people that often-dangerous task. They contribute to ecosystem balance and potentially reduce greenhouse gases at the same time.

So, the next time you see them riding the air currents, give them a fond thank-you for their services as one of nature's great IPM tools.

Further Reading

For more information on IPM and pest-control techniques from the EPA, visit www.epa.gov/safepestcontrol/integrated-pest-management-ipm-principles.

Why Does Landscape Matter for IPM?

By Diana Obregon, Postdoctoral Associate, New York State Integrated Pest Management Program

Crops don't grow in isolation; they are embedded in a matrix of different land covers that influence what is happening in the fields.

Landscape composition and configuration can tremendously affect the abundance and diversity of herbivores, pollinators, and natural enemies due to the movement of organisms and their functions among natural and agricultural areas. If the landscape effect is not considered, it becomes harder to predict the success of integrated pest management (IPM) strategies.

The constant changes in land use and the expansion of areas for agriculture and livestock production make this topic relevant. This is why it is crucial to understand how landscapes impact ecosystem services and their cascade effects on productivity. Following are some examples.

> Crops don't grow in isolation. They are embedded in a matrix of different land covers that influence what is happening in the fields.

Natural Areas and Pest Parasitism

In strawberry fields in New York State, it was shown that the decrease of natural areas surrounding the crops results in a reduction of parasitism rates of crop pests, with higher numbers of the pests, and a consequent reduction in yield (Grab et al. 2018).

Similar results were found for Lepidopteran herbivores in cabbage crops, where landscapes with a lower proportion of meadows showed an increased infestation, likely resulting from decreased parasitism (Perez-Alvarez, Nault, and Poveda 2018).

Agricultural Effects on Predation

Landscape effects can be complex and sometimes unpredictable. A study looking at the predator community of ground beetles in different cabbage fields found that in agriculturally dominated landscapes, beetles shifted their size distribution toward larger body sizes with higher predation rates (Perez-Alvarez et al. 2021).

Landscape Complexity and Pollinators

As for pollinators, they tend to decrease their abundance and diversity as the landscape is more simplified, which can commonly result in negative consequences for yield (Connelly, Poveda, and Loeb 2015; Obregon et al. 2021). This trend can be explained by the loss of floral and nesting resources that the pollinators need to thrive (Heard et al. 2007; Potts et al. 2005).

> Landscape composition and configuration can tremendously affect the abundance and diversity of herbivores, pollinators, and natural enemies.

Beneficial Organisms' Pesticide Exposure

Landscapes can also modulate pesticide exposure for beneficial arthropods. In apple orchards, it was shown that the predation rate of sentinel eggs of the codling moth (*Cydia pomonella*) was negatively affected by the toxicity of the crop protection program in the farm, but also by the amount of agricultural area surrounding and the pesticide regime in adjacent farms (Monteiro et al. 2013).

Also, in apple orchards, it was shown that the use of pesticides is negatively correlated with bee richness. However, this effect was weakened on farms with more natural habitats in the landscape (Park et al. 2015).

Landscape and Management Factors Viewed Holistically

In general, scientific evidence suggests that landscapes with dense and connected natural vegetation may enhance populations of beneficial arthropods, which immigrate into the crop fields to regulate pest populations and pollinate.

However, it is always good to keep in mind that the immense diversity of organisms and cultivated plants can result in unexpected interactions, with particular patterns emerging when considering not only the local conditions but also the landscape level.

IPM recommendations should be tested at different landscapes, which will inform their effectiveness and the areas where adoption should be prioritized. Understanding the landscape context is also crucial for collaborative pest-management efforts since coordinating pest-control strategies across properties can be more effective in preventing pest outbreaks and reducing overall pest pressure.

> Scientific evidence suggests that landscapes with dense and connected natural vegetation may enhance populations of beneficial arthropods.

About the Author

Diana Obregon is a postdoctoral associate working on pesticide risk assessment at the New York State IPM Program, based at Cornell University. Diana received the Outstanding Achievements in Integrated Pest Management Award from the Northeastern IPM Center in 2022 for her contributions to pollinator protection in agricultural systems.

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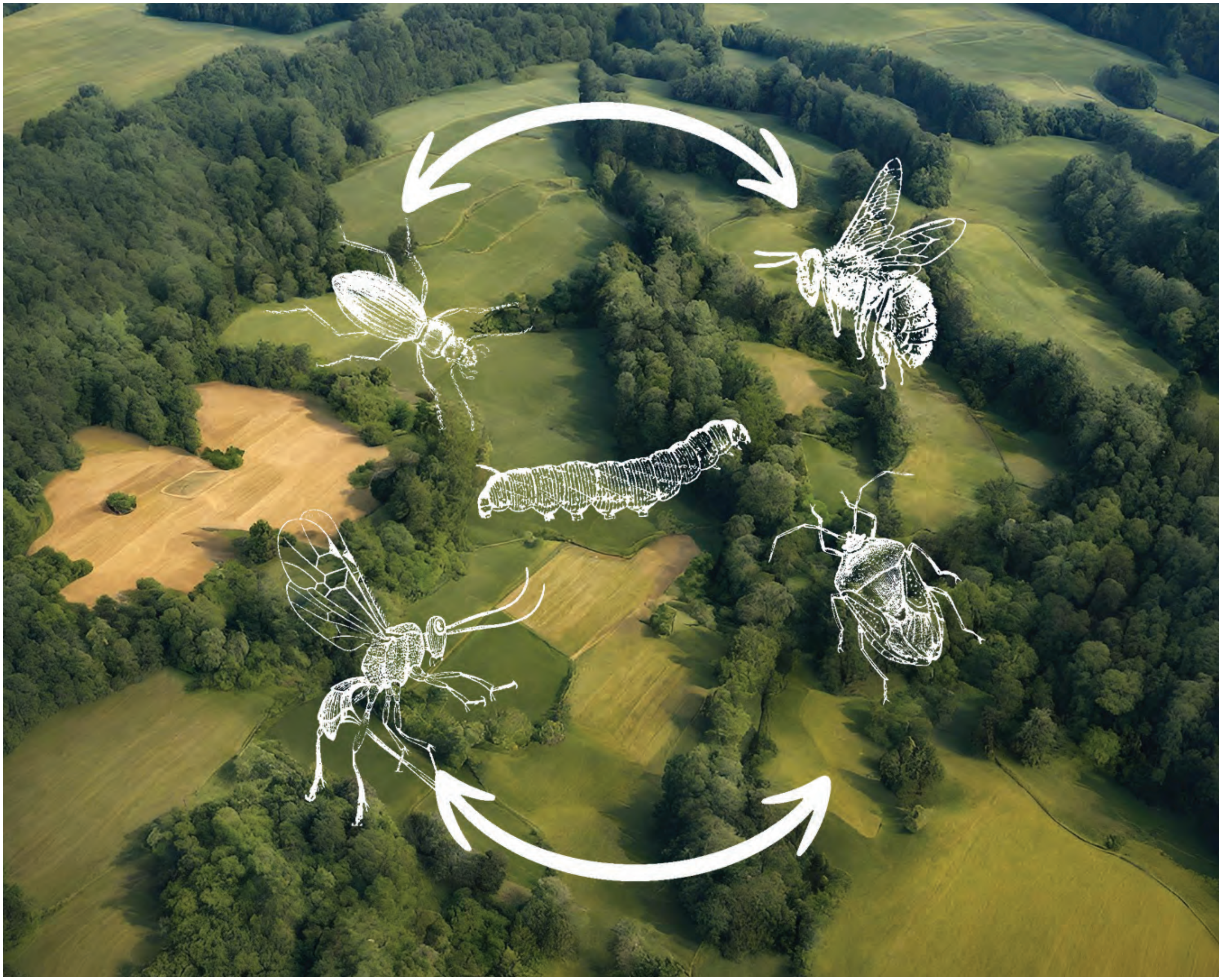

Herbivores, pollinators, and natural enemies move across land covers, changing local dynamics. Image provided by Diana Obregon

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Avian Flu: An Ongoing Threat and Use Case for IPM

Avian influenza—also known as avian flu or simply bird flu—is a type of influenza virus that occurs naturally among wild birds, but it can spread to various domesticated bird species, potentially causing severe illness or death.

Among other concerns, this makes bird flu an economic threat to those whose livelihoods depend on avian livestock, and the impact is widespread. Data for 2022–2023 from the United States Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS) showed confirmed detections in over 1,000 flocks—representing 47 states and more than 72 million birds—as of early December 2023.

Avian influenza is a concern for poultry farmers. Photo: K-State Research and Extension, flic.kr/p/2n5wjKR, CC BY 2.0

Humans and Other Mammals

Although not the virus's primary hosts, mammals—including domestic cats and dogs—have been known to contract it, generally through eating infected birds.

And although rare, infection in humans is not unheard of, with two fatal cases having been reported as recently as October 2023 in Cambodia, according to the Centers for Disease Control and Prevention (CDC).

> Widespread use of biosecurity measures—an integrated pest management (IPM) method, in this case against a pathogen—is especially critical.

Response and Management

CDC is the lead U.S. federal agency for the virus's currently limited human-health implications. Otherwise, the Department of the Interior and USDA-APHIS are the primary agencies responsible for investigation and control.

Academic institutions and extension organizations are also taking steps to help the public learn how to mitigate the spread of the disease. Widespread use of biosecurity measures—an integrated pest management (IPM) method, in this case against a pathogen—is especially critical.

In August 2023, Pennsylvania State University announced that its Department of Animal Science was sponsoring biosecurity kits for county 4-H programs throughout the state. The kit includes items for use at public 4-H animal events.

For More Information

- **Centers for Disease Control and Prevention:** www.cdc.gov/flu/avianflu
- **USDA-APHIS:** www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/avian/avian-influenza
- **Penn State 4-H biosecurity kit news release:** www.psu.edu/news/agricultural-sciences/story/animal-science-department-provide-biosecurity-kits-4-h-programs/
- **Poultry biosecurity guidance from the Iowa State University College of Veterinary Medicine:** poultrybiosecurity.org

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Developing adjacent-apartment inspection protocols is vital for all pests, not just bed bugs. The work-order system must trigger automatic adjacent apartment inspections and additional control measures.

The study also used work-order data to prioritize resource allocation to the buildings with higher-level and more-frequent infestations. When prioritizing work across a PHA, it can be helpful to use data to prioritize buildings based on pest complaints per number of apartments.

Customizing Work Orders to the Task at Hand

Another finding that demonstrated the importance of communication is that offering a wider variety of work-order types can both increase and track the thoroughness of treatments.

When work orders collect only general information (i.e., “pest-control treatment”), we don’t know all that has been done and whether IPM methods—including preventative treatments like exclusion—have been used. Using an expanded work-order list can help prioritize additional actions that are sometimes overlooked or that there is no time to complete. And if services are not documented in a work order, they probably are not being completed.

Of particular importance for IPM, including an expanded list of tasks allows time and resources to be devoted to preventative measures, not simply reactive ones. If there is a work order to apply exclusion measures (e.g., installing door sweeps, filling holes), you know this task was completed rather than assuming it was tacked onto a pest-control treatment.

The MPHA expanded their system to include an additional 17 work-order types for treatments and prevention. This allows the housing site to analyze what has been done and what has proven effective. It also allows the MPHA to track actual pest treatments separately from preventative measures, which demonstrates how preventative work helps decrease the need for active treatment.

Resident Outreach

Unreported or unknown infestations can be a population reservoir that keeps a steady supply of pests in a building and circulating around. Measures like offering education programs or meeting with residents are aimed at increasing residents’ awareness of pests and signs of their presence, and seek to encourage reporting of pests.

When residents request an inspection or treatment, it allows pest-control technicians into more homes and enables them to gain better control building-wide.

There is a caveat: analysis of MPHA data showed a spike in complaints around the time the resident education program was provided. More residents were inclined to report pests or request an inspection after the education program, but this impact was temporary, and complaints went back down shortly thereafter. This suggests resident education is effective but needs to be repeated on a regular basis.

Resident education programs are aimed at increasing residents’ awareness of pests and signs of their presence. Photo: StopPests in Housing Program

> Including additional work-order types allows the housing authority to track pest treatments separately from preventative measures, which demonstrates how preventative work decreases the need for active treatment.

Study Conclusions

Through the analysis of the MPHA data, the study offers four main conclusions for improving pest-control success across an organization:

- Standardize expectations for pest-control technicians to provide thorough service. Communicate and allow for technicians to spend more time in chronic apartments with fewer work orders per day. Break out work orders into detailed treatment and prevention subtypes so the organization can measure a drop in pest treatments when prevention jobs like exclusion are done.
- Develop adjacent-apartment inspections protocols for all pests.
- Use pest complaints to prioritize more infested buildings and allocate resources and time to doing an effective job.
- Resident education works, but it has to be regularly repeated.

For More Information

To watch Kells present his findings, watch the recorded webinar: stoppests.org/go/3steps

New Funding Opportunities Further Regional IPM Centers DEIA Commitment

The Northeastern IPM Center and other regional IPM centers have increasingly embraced the active role we can play in fostering diversity, equity, and inclusion in integrated pest management. The Center recognizes *Diversity in IPM* as one of our cross-cutting issues and, in 2022, launched a *Diversity in IPM* initiative, initially as a series of webinars and virtual roundtable discussions.

Visit neipmc.org/go/yBmD for more information, including recordings of past presentations and a list of any upcoming ones.

DEIA Grants and Fellowships

Building on this direction, the regional IPM centers recently released diversity-focused funding opportunities with a total of about $200,000 available nationally. The goal is to make diversity, equity, inclusion, and accessibility (DEIA) both essential and commonplace within the IPM community.

Three opportunities are available:

- **DEIA Grants:** $120,000 available with awards of up to $20,000 each. Applications will be considered through January 31, 2024, or until funds are exhausted.
- **DEIA Fellowships:** Up to eight fellowships of up to $6,000 each will be awarded. Applicants should be faculty, staff, or students at an 1890, 1994, historically Black college or university (HBCU), or Hispanic-serving institution (HIS), and should be actively involved in IPM or plant-health activities. Applications will be considered until funds are exhausted.
- **DEIA Mini-grants:** Up to $30,000 available with awards of up to $5,000 each. Applications will be considered until funds are exhausted.

A webinar was held November 7, 2023, to answer questions and provide more information. To view the recording, visit youtu.be/sdVAKzO2YJs.

To learn more, visit www.ipmcenters.org/research/funding/deia/.

Credits

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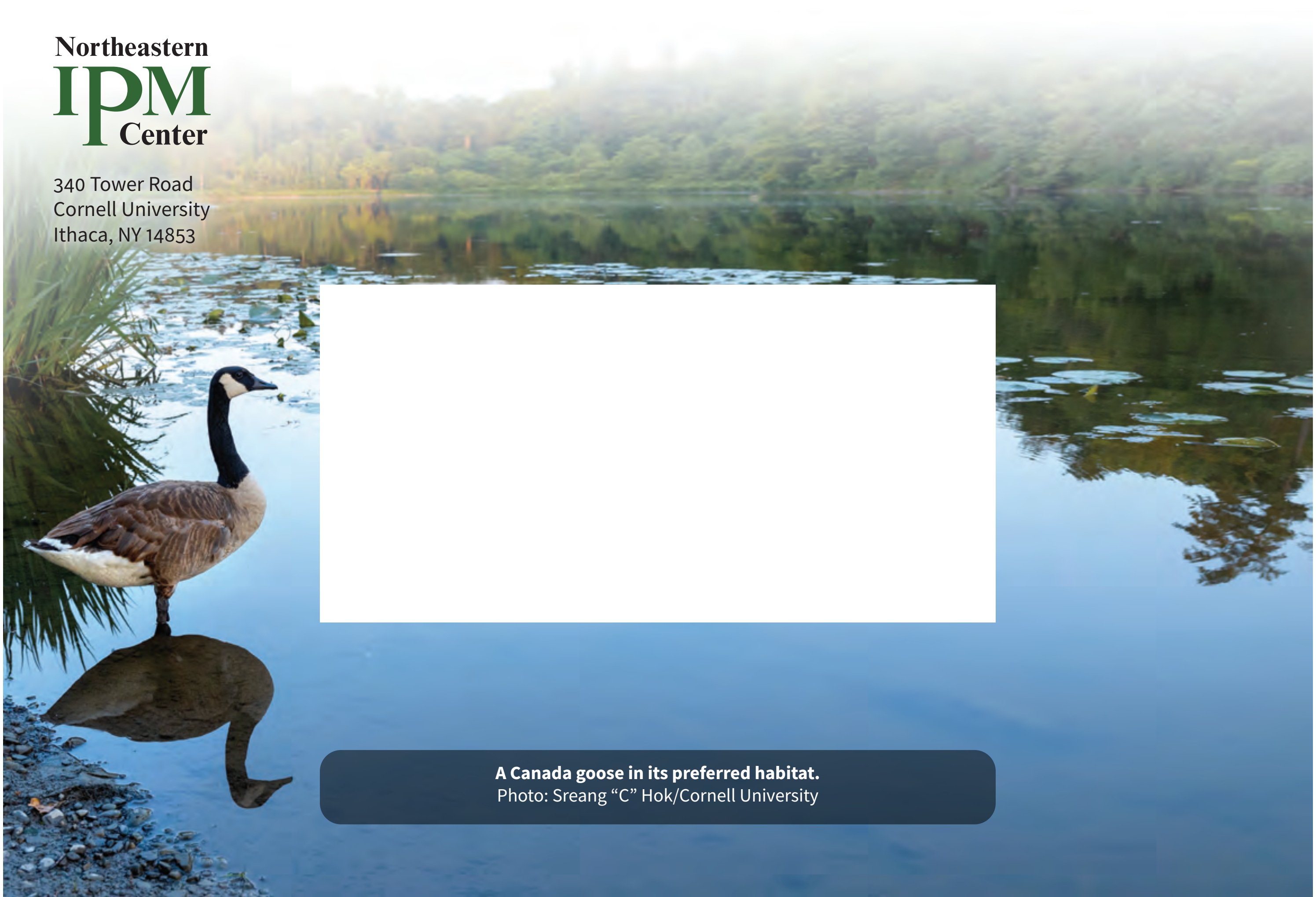

A Canada goose in its preferred habitat.
Photo: Sreang "C" Hok/Cornell University