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Yellowjackets And Other Wasps

Dealing With Pests After a Storm



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ON THE COVER

The European paper wasp, *Polistes dominula*, is often mistaken for a yellowjacket due to its similar appearance. The paper wasp is less aggressive, and its nest is an umbrella-type paper nest, unlike the yellowjacket. This invasive wasp is replacing native wasps in some areas.

Photo by Rob Lopshire



Kevin Eng, FWC



Rough Road to Recovery

Message from the President of FPMA, Suzanne Graham

AS THIS issue of *PestPro* goes to press, our colleagues in southwest Florida are literally digging their way out of the aftermath of Hurricane Ian.

I live in Charlotte County, and the company I work for has offices in the three counties that were the hardest hit: Lee, Collier and Charlotte. I have seen the devastation firsthand. I can frankly say that I never want to go through this experience again. I would not wish this on my worst enemy, let alone fellow pest management professionals and members of Florida Pest Management Association, whom I have had the honor to serve as president.

While FPMA and our sister organization, the Florida Pest Management Foundation, have been around when hurricanes hit in the past, we have struggled with how to help our colleagues in need. This time we decided to try something direct and personal. After HQ called all our members and many nonmembers in the three counties, we compiled a list of requested supplies and established three collection points for these supplies in Broward, Duval and Pinellas counties.

We also established three distribution points, one in each of Lee, Collier and Charlotte counties, where colleagues in need could pick up supplies. We called for members who were willing to transport supplies from collection to distribution points.

Finally, we set up a way for people to donate to the Foundation directly so that we could purchase goods to narrow supply gaps. By the time this issue goes to press, we will have made purchases, made several runs, and have reached out to colleagues to “come and get it.” Recipients of donations are required to show a pest control ID card, but they are not required to be members of FPMA.



Hurricane Ian storm damage and flooding. Florida Fish and Wildlife Law Enforcement response in the aftermath of Hurricane Ian. September 30, 2022. Photo by FWC

In situations such as these, we wish we could do more. As with anything, the first time you try something it's a learning experience. One thing we do know is there will be other hurricanes. Next time, we will be better prepared to help.

For those of you who want to continue to help, please go to the FPMA website under #HURRICANEIAN to find out more and/or make a financial contribution to the Foundation.

We are here, and we are listening. **PP**

*Suzanne Graham
President, FPMA*



Visit flpma.org for currently scheduled meetings and more.

Antidote to Disaster: A Pest Control Industry with Heart

IT IS so sad that folks in Florida have experienced another hurricane disaster. Many remember when Hurricane Andrew cut across South Florida in 1992, causing \$27 billion in damage (\$57 billion today) and 26 deaths. Hurricane Michael hit the Panhandle in 2018, causing \$25 billion in damage and 59 U.S. deaths. In September we experienced Hurricane Ian, which caused at least \$67 billion in damage through Florida and the Carolinas and 135 U.S. deaths.

The Florida pest control industry has a big heart and pitched in after each one of these emergencies to provide valuable support and protection to the affected communities. Unfortunately, the work the pest control industry does to help the community recover after a disaster is largely unseen.

Any time there is a natural disaster or war, pests and their damage or public health importance become a vital part of recovery efforts. When buildings and infrastructure are destroyed, many pest problems are either exposed or develop. As a former Navy entomologist and lieutenant in the Medical Service Corps, I learned the types of problems to anticipate after a hurricane. So let's take this one step at a time and review the necessary steps for present and future recoveries.

Step 1. Termites

Termite damage tends to be unseen and unimportant until there is a hurricane with high wind velocity and storm surge. Many houses do not have termite protection. They may have been built properly at the time, but we have learned that hurricane tie-downs for the roofing systems are important. Roofs do not stay on houses if the hurricane tie-downs have no wood for them to attach to. After a severe storm, you can go through the neighborhoods and see houses where termites have eaten the wood that was supposed to hold the roof and walls in place during a hurricane. Those houses are the ones without roofs and even walls.

In 2002 Steve Dwinell, who was with FDACS at the time, and I worked with the pest control and building industries to require termite protection for new construction. Many homeowners did not keep their contracts up to date to continue their protection from termites. We figure fewer than 50% of homeowners have

termite protection in place. Those are the homeowners at risk of severe damage, because termites can eat the wood that is attached to the hurricane tie-downs. No wood means no hurricane protection. Impress upon your customers the importance of termite protection to prevent hurricane damage.

Step 2. Flies

Everyone knows how important power is to prevent food from spoiling. During a hurricane, power is often disrupted over large parts of Florida. That means that food refrigeration is disrupted for possibly days or weeks. Spoiled food needs to be discarded, and after hurricanes it is typical to see food warehouses and homeowners disposing of spoiled food either in the trash or next to loading docks. One of the first pests to arrive after a hurricane is flies. These are often blow flies and flesh flies that develop in the rotting and spoiled meat that is thrown out. These flies arrive within about a week after a hurricane. They are faster to arrive than the mosquitoes due to their rapid development.

Of course, you expect that trash services would remove the spoiled food to landfills in order to cover it over with mats and soil. However, after a hurricane the infrastructure of trash pickup is completely disrupted. Roads and bridges are closed or completely destroyed. So the trash just accumulates, resulting in large numbers of flies. Usually the mosquito districts or FEMA arrange for aerial applications of insecticides to affected areas. After hurricanes Andrew and Katrina, when the insecticides were applied, you could hold your cupped hand out after aerial sprays, and it would fill up with dead flies.

Another factor in fly production is the disruption of sanitary services. Often the sewer pumping stations or septic tanks are overloaded with water. This means sewage backs up. House flies are the major pest associated with sewage, although some of the small flies, like phorid flies and filter flies, can be a true problem in transmitting cholera and many other disease-transmitting organisms from sewage and spoiled food. Be prepared to protect your customers with a fly-control program after hurricane disasters.

Step 3. Mosquitoes

One of the most important insect pests to emerge after a hurricane is mosquitoes, particularly floodwater mosquitoes. Floodwater mosquitoes lay their eggs above the water line. The eggs wait for a flooding event to cover them with water, then they hatch. These eggs can stay alive for about five years. When there is a tremendous downpour of rain during a hurricane, water levels rise and can cover about five years of mosquito egg laying. Those eggs hatch, and mosquitoes emerge as biting adults in 10 to 14 days.

Since the Zika scare in 2016, the pest management industry has started providing mosquito control services for customers. Mosquito districts also provide mosquito protection to communities, but pest control companies take on the responsibility of protecting individual customers. One of the best ways to approach mosquito protection is to provide integrated mosquito management. An integrated management program may consist of space spraying, residual mist blowing, and mosquito traps. One company, Insecto, has offered up 100,000 traps to emergency services in the Hurricane Ian-affected areas of Florida. Protect your customers from mosquitoes by offering an integrated mosquito management program.

Take-Home Message

Natural disasters like hurricanes result in damage and pest problems. Pests like termites that damaged houses before the storm can cause them to collapse during the winds and storm surge. Flies develop in the rotting food and sewage that is a consequence of natural disasters. Floodwater mosquito populations can explode when the mosquitoes develop into biting adults that can vector diseases. There is never a greater need for pest control than after a hurricane. The industry has always been available to provide services and volunteerism to help the unfortunate victims of these storms.

Let's salute the pest control companies that provide essential services to protect people and their properties during these times of natural disasters. This industry has a huge heart and has raised donations to meet the needs of the hurricane victims. It is wonderful to see how this industry supports others in need. **PP**

— Dr. Philip Koehler,
Managing Director, *PestPro*

Dealing with Pests After a Storm



HURRICANES, heavy storms, tornadoes. Natural disasters can bring problems with pests such as mosquitoes, termites, flies, snakes and more.

Some pests become unwelcome guests in and around homes and may disrupt cleanup and repairs. Other pests may cause future problems if repairs are not completed properly. The type and extent of pest problems depends in part on the time of year and the seasonal cycle of pest activity.

In this issue of *PestPro*, we examine some common pest problems that may occur in the aftermath of a storm.



Wasps may invade protected spaces such as alongside this car's fuel tank cap.



Paper wasp nest, showing several life stages



Baldfaced hornet

Yellowjackets *and* Other Wasps

Philip Koehler



Jacopo Werber

Yellowjacket wasp



Baldfaced hornets built this nest under house eaves. These nests are constructed with several protective layers of "paper."

YELLOWJACKETS and hornets are venomous wasps with about 26 species in the United States. The name yellowjacket refers to the typical yellow and black bands on the abdomen. The baldfaced hornet, a close relative, has white and black bands.

Yellowjackets do not bite. All yellowjacket species have a stinger that can inject a very painful venom into the skin. Most of the yellowjacket species in Florida build underground nests, although they can also be found in aerial nests.

Yellowjacket nests are surrounded by a paper envelope. Inside the envelope are combs with cells similar to bee cells. The mature size of a colony ranges from 500 combs in two cells to 15,000 cells in eight to 10 combs. Some of our Florida colonies have been reported to have nests 6 to 9 feet tall with over

100,000 cells. Normal colonies have from 75 to 5,000 worker yellowjackets.

Yellowjackets are a seasonal problem. The queen yellowjacket builds the initial nest all by herself in the spring. The king is long dead when the queen lays eggs. When the first workers emerge, the queen stops foraging and no longer leaves the colony. During summer and fall, the colony rapidly grows and produces queens and males that emerge from the colony and mate. Therefore, the worst time for yellowjacket problems is during fall. Fertilized queens leave the colony and hide in protected places like mulch and leaf litter until spring.

After a Storm

Wasp colonies are close to full size by fall. Flooding and winds may damage the nests, disrupting the colonies and even

leaving them homeless. Shrubs and fallen trees may contain hornet nests. Paper wasp nests may be found on eaves, roof overhangs, or under porches and other protected areas of buildings. Yellowjackets may be flooded out of their underground nests.

Numerous adults will be seen flying around the nest and may be attracted to foods and exposed trash outdoors. Yellowjackets are often attracted to freshly cut and broken wood for the sap or as nesting material. Be cautious when cutting trees and removing branches and other debris. Watch where you step, and look for yellowjacket nests in the ground. Normally, unless a nest is nearby, the wasps are probably out foraging and are less likely to sting.

Continued on next page



Look before you sip when dining outdoors.



A tight lid on garbage keeps the wasps away.



Beware the hazard of yellowjacket ground nests.

Further Facts

Yellowjackets typically feed on decaying protein and carbohydrates. They love to visit garbage cans, rotting fruit, rotting meat, and soft drinks. One of the hazards is being stung while you are drinking sugary sodas. The problem at schools is that they often have picnic areas with open barrels used as garbage cans. Much of the problem can be solved by providing tight covers for garbage.

Of course, stepping into a mature underground nest can be hazardous to your health. The majority of cases of people receiving hundreds of stings usually occurred from wandering into a wooded area and stepping into a mature nest. Then thousands of yellowjackets can swarm after the unlucky adult or child. If the victim is wearing thin clothing, the wasps can sting right through the clothing.

The stinger of yellowjackets is not barbed like the stinger on bees. For that reason, one yellowjacket worker can repeatedly sting a victim. A normal reaction to a sting involves only the immediate area of the sting and swelling appears in two to three minutes. It involves redness, itching, pain and formation of a wheal at the site. Usually the symptoms abate within two hours.

Yellowjackets can kill people in two ways: by sheer numbers of

stings causing toxic effects and by the allergic reactions in sensitive individuals. It generally takes about 1,500 stings to kill an adult man by the toxic effects of the venom alone. As in the case of pesticide poisoning, children are more susceptible to the toxic venom because of their lower body weight. One child that died supposedly was stung 300 to 400 times. The toxic action of venom was described for a man who received over 2,000 stings. He had a severe headache, vomiting, diarrhea and shock.

For allergic people, one sting can be deadly. In fact, a severe allergic reaction can result in death within 15 to 20 minutes, although 20 to 30 minutes is more common. Severe reactions start with local pain and itching that eventually becomes widespread skin irritation. The victim feels a constriction in his throat and chest and breathing becomes difficult. A study of 641 deaths due to yellowjackets, bees, and wasps reported that respiratory congestion accounted for 53% of the deaths.

Yellowjacket Safety Tips

- ✗ Don't swat at them. Yellowjackets attack and sting when aggravated. They also release a chemical that causes others to join the attack.
- ✓ Wear protective clothing such as gloves, boots, long pants and a hat when working on

storm cleanup. Yellowjackets can sting through lightweight fabrics.

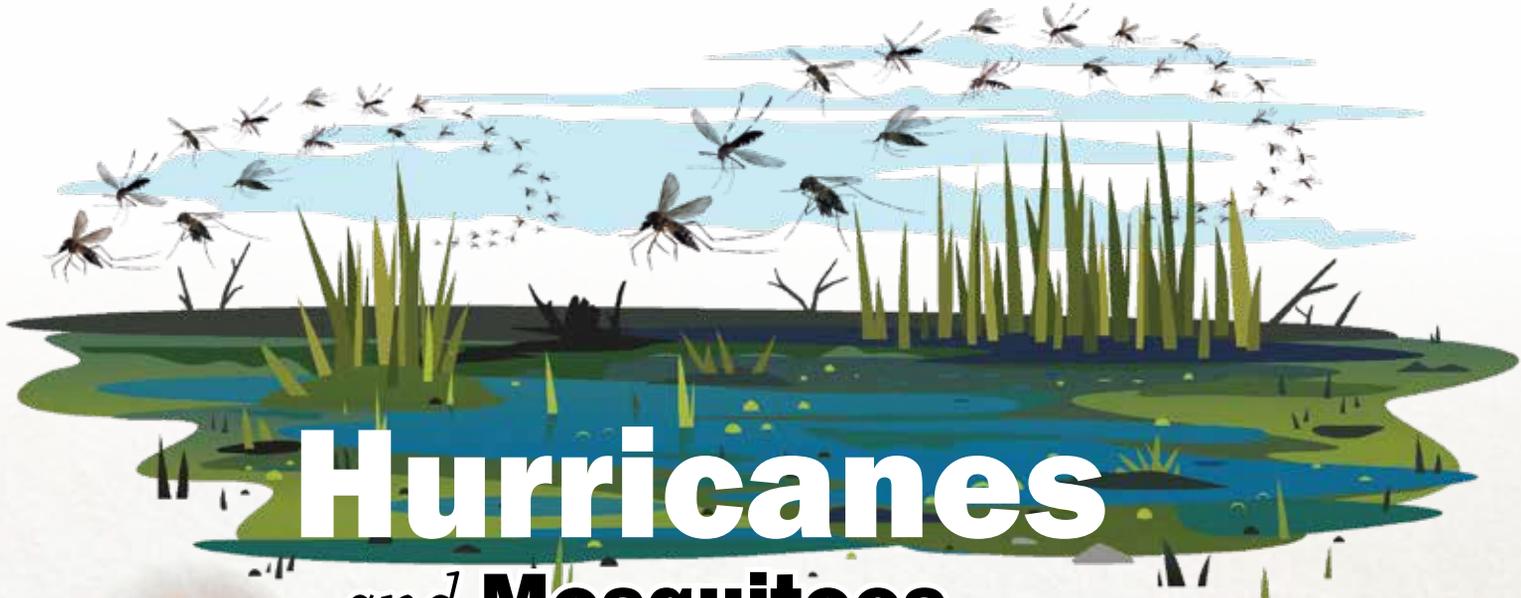
- ✓ Caution children about playing in overgrown areas. These are prime nesting areas.
- ✓ When eating outside, look before you sip. Yellowjackets are attracted to sweet, sticky foods and drinks like soft drinks and fruit juices.
- ✓ Cover trash containers so yellowjackets can't get in. The pests forage in the garbage for food scraps and drink containers.
- ✓ Homeowners should call a professional pest control operator to eradicate a yellowjacket nest. This is a dangerous and possibly deadly task for an amateur.

If you are stung, the treatment for a normal or mild reaction is to apply an icepack, take a pain reliever, and wash the wound carefully. Oral antihistamine may reduce swelling that can occur. Calamine products can reduce the itching. For severe local reactions, considerable swelling and tenderness around the sting bites, rest and elevate the limb and avoid exercise. Medical attention may be needed if the sting is around the throat, nose or eye area. Medical treatment could require analgesics, oral antihistamines, and systemic steroids.

Immediate and aggressive treatment is necessary for people who are allergic to stings. Symptoms include closing of the throat, severe swelling, and hypotension.

If you know you are allergic, carry an emergency sting kit. Consider carrying a medic alert tag or card on your person. **PP**

Philip Koehler is Professor Emeritus in Urban Entomology at the UF/IFAS Entomology and Nematology Department.



Hurricanes

and Mosquitoes C. Roxanne Rutledge Connelly



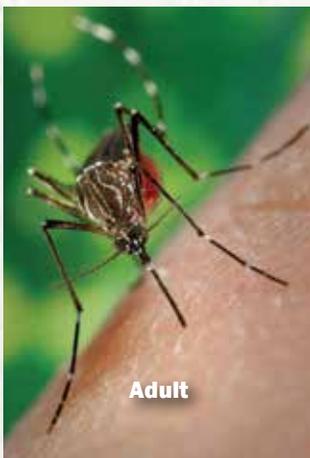
Egg



Larva



Pupa



Adult

CDC

Mosquito life cycle, Aedes aegypti shown. One female floodwater mosquito has the potential to lay 200 eggs per batch.

WHY does Florida experience such high numbers of mosquitoes after a hurricane?

Mosquitoes go through four developmental stages during their life: egg, larva, pupa and adult. Dozens of species of mosquitoes reside in Florida, and the different species have differing means of surviving.

In addition to many environmental variables, there are two biological attributes related to mosquito egg-laying that contribute to the numbers of mosquitoes seen and felt during a post-hurricane period. The attributes separate mosquitoes on the basis of the conditions in which they lay their eggs. The two groups are floodwater mosquitoes and standing-water mosquitoes.

Floodwater Mosquitoes

Many people associate mosquitoes strictly with standing water, with the belief that mosquitoes have to have water to lay their eggs. The fact is, mosquito eggs need water to hatch — but some species lay their eggs in moist soil (not standing water) and actually the eggs need to dry out before they can hatch. These mosquitoes are the “floodwater” species.

As far back as one year from the time the floodwater mosquitoes are noticeable, the adult female mosquitoes were flying around, feeding on blood, and laying eggs in moist areas of pastures, citrus furrows, salt marshes, and swales. These moist areas eventually dry out, and the mosquito eggs also dry and become encased in the cracks and crevices of the dried mud. Because of their unique biology, the eggs need to dry out before they can hatch into larvae. The eggs survive in the dry soil through the winter and spring, and then with rains from storms or hurricanes, those areas are inundated with water. The water that reaches the eggs provides a cue to hatch.

One can consider the potential extent of this habitat by thinking about how much land in Florida is pasture, citrus grove, or large expanses of uninhabited flat land. There are estimates of the number of mosquito eggs in a floodwater habitat between 0.7 and 1.3 million eggs per acre. Yes — per acre. If only a small percentage of those eggs hatched and survived to the adult stage, the number of

adult mosquitoes flying around looking for blood at one time is almost incomprehensible.

Unfortunately, for those who are diligent about dumping water and cleaning up containers around their home, this type of local, small-scale effort will not contribute much impact to reducing mosquitoes in the floodwater sites.

Standing-Water Mosquitoes

Mosquitoes that are not in the floodwater group lay their eggs on standing water. Another difference between the two groups is that mosquito eggs in this category cannot withstand drying out. If the water dries up, or the egg gets stranded on the grass or soil, the egg dries and that will be the end: It will not hatch into a larva.

Females will lay their eggs on the water surface and the eggs will typically hatch in about 24 hours. Water is necessary to complete the life cycle, and soon the larva will change into a pupa and then emerge into an adult that will soon be hungry for blood. After the newly emerged female mates and finds a blood source, she can start the cycle all over again by laying her eggs on the standing water.

Continued on Page 11

UF Technology to the Rescue

HURRICANE IAN caused horrific damage to Florida's southwest coast and other areas, killing at least 135 people and causing more than \$67 billion in damage to buildings and infrastructure.

The enormous amount of standing water left in Ian's path provides breeding substrate to several mosquito species. Mosquito populations in hurricane-affected areas of Florida raise concerns for potential transmission of West Nile virus, dengue and other mosquito-borne diseases.

But thanks to a generous donation from one company — INZECTO — University of Florida mosquito control technology is coming to the rescue. The INZECTO team and the UF Research Foundation could not remain impassive to the tragic event that affected so many Floridians. So INZECTO donated 100,000 units of its innovative INZECTO Mosquito Trap to be distributed in areas affected by Hurricane Ian.

INZECTO mosquito control technology was first developed as a tool to protect American troops in the battlefield from disease-carrying mosquitoes. This technology is now commercialized under the name INZECTO Mosquito Trap. The trap does not need electricity to work — it only needs to be filled with water, placed in shade, and left undisturbed. There is no spraying or zapping. Beneficial insects like bees and other pollinators are not attracted to the trap, so they are not harmed.

Florida Insect Control Group LLC does business as INZECTO, a Gainesville, Florida-based company. It is the result of a multi-faceted, global collaboration of academic research, federal funding, private investors, innovation, and entrepreneurship that has brought to life efficient, easily deployed solutions to combat serious public health threats exactly like the one facing millions of Floridians after Hurricane Ian. **PP**



INZECTO MOSQUITO TRAP DISTRIBUTION

DONATED mosquito traps were shipped to the counties highlighted (see map). Distribution is expected to continue for several weeks, with free traps handed to the public by volunteers led by Master Gardeners at several locations in Lee, Orange and Charlotte counties, and by partners such as Northwest Exterminating, Hometeam, and Collier County Mosquito Control in other locations.

For more information, contact the UF/IFAS Cooperative Extension Office in Lee, Orange, Charlotte or Collier counties.





Female standing-water mosquito laying eggs

Mosquitoes, continued from Page 9

The Double Whammy

The combination of the egg-laying habits of these two groups of mosquitoes provides for a double whammy put in place by activity that occurred with hurricanes and tropical storms. When dry areas flood, the floodwater mosquito eggs hatch. When the floodwater has nowhere to go, the standing-water mosquitoes have more places to lay their eggs.

What Can Individuals Do To Relieve Mosquito-Biting Pressure?

Draining water is recommended for reducing mosquito habitats. But just how are you going to drain an acre full of water? The recommendation to dump the water applies to mosquitoes that lay their eggs in water-holding containers that individual homeowners have control over, such as pet dishes, vases, and cans. The advice is good for average, everyday situations—that is, the times when Florida has not been in the path of a hurricane or tropical storm. The mosquito habitats resulting from the types of rain events from hurricanes are too vast for an individual homeowner to attempt to impact. It is best to leave the source reduction and treatment of such vast water sources to the mosquito control agencies.

In counties that have mosquito-control programs, help

may not be immediate because there are such large areas that may need to be treated. And it may not be permanent—remember that mosquitoes fly. Even though an area may be treated to knock down the biting mosquitoes, there will likely be reinfestations from other areas due to the widespread flooding in the state.

The most effective way to stop a mosquito from biting is by wearing an effective mosquito repellent on the exposed portions of the body. Protective clothing is often mentioned as a deterrent, but during the very warm summer and fall evenings in Florida, especially for those who may not have electricity, long sleeves and long pants may not be practical.

The second best advice is to stay indoors. Check for damage to your home from the storms that may not be obvious. Look for holes in window and door screens; check for any newly formed open areas around your roof and windows where mosquitoes may gain access indoors; if you have pets that have access to both indoors and outdoors, brush their coats with your hands before they come inside to remove any mosquitoes that may be hanging on. **PP**

C. Roxanne Rutledge Connelly is a former Professor, UF/IFAS Florida Medical Entomology Laboratory, Vero Beach, Florida.



An example of prime habitat for female mosquitoes to lay eggs

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Russell Pjau

Storm Cleanup?

Watch Out for Fire Ant Rafts

POST-STORM cleanup is something we all want to start as soon as possible after the storm passes. However, we need to be very cautious and aware of the possibility of potential hazards, like downed electrical lines, subsurface debris and — fire ant rafts.

Yes, THAT red imported fire ant, or RIFA. The one that bites and stings and leaves a lasting impression of agony, itchiness and pustules. Amazingly, these insects can and do create “rafts” made entirely of interconnected ants to float away on flood waters.

As the water rises, the ants get flooded out of their subterranean nests. The ants then band together to form a biological, floating raft or ball, with such high surface tension and strong connections that they are nearly impossible to break apart. The ants then carry their queen, workers and larvae — the immatures — on top of the raft and “float” to higher ground.

What is ‘higher ground’?

Keep in mind that higher ground can be anything that is dry: a tree, a dead palm frond, a debris pile, or your leg. Once

they come in contact with a dry object such as your arm or leg, they will start to offload their members. The soldiers and workers will defend those nestmates by attacking the “enemy” with unrelenting bites and stings.

Be prepared when going outside to clean up debris. When heading outside to start your post-storm cleaning, make sure to wear work gloves, closed-toe shoes, long sleeves, and long pants. Be on the lookout for floating brownish-red areas that look like small particles of debris or mulch. More than likely, these are living rafts of RIFA colonies.

What NOT TO DO if you encounter a floating RIFA ant raft

- ✗ Do NOT try to push the colony down into the water to drown them. They will not go underwater, but they will go into attack mode.
- ✗ Do NOT try to scoop them up with a pool net or any other object.
- ✗ Do NOT try to toss water on the raft, as this will only dissipate some of the raft, provoking hundreds of ants to turn on the “attacker.”



Ant rafts may resemble debris or mulch in the water

What you CAN DO

- ✓ Fill a water spray bottle with diluted dishwashing soap at a ratio of two tablespoons dish soap to one gallon of water.
- ✓ Apply the soapy mixture as a spray over the top of the raft. This soapy mixture will break the surface tension of the water. This causes the ants to sink, and they will soon drown.

What to do if ants get on you

If ants get on your skin or clothes, quickly brush them off with your hand or use a handheld whisk broom.

Attempting to remove them with a stream of water or jumping into a pool will not help, as they will just tighten their hold.

If you or someone you know is allergic to fire ant bites/stings, seek medical attention. When the ants attack, a mixture of alkaloids is injected through the sting. Dabbing white vinegar onto the affected area may help neutralize the stings. Applying an over-the-counter hydrocortisone cream to the area may also help in alleviating the itchiness. **PP**

Carol Wyatt-Evens
UF/IFAS Ext. Sarasota County

The 'Cheerios Effect' Helps Fire Ants Form Rafts

EVER STARE at those last few pieces of breakfast cereal and watch them seemingly clump together or cling to the side of the bowl?

Scientists have dubbed it the "Cheerios effect," the combination of forces causing those clumps. Researchers at Georgia Tech have discovered those same forces draw small numbers of ants together to begin to form water-repellent ant rafts — even though the ants seem to be uninterested in collaborating with their neighbors for survival.

Described in the journal *Physical Review Fluids*, their study explains for the first time the underlying forces at play in attracting ants to each other. Ants clump together into rafts

to survive during flooding, and the team determined it takes exactly 10 ants to form a stable raft.

"The motivation here was to understand how these individual parts come together," said Hungtang Ko, a mechanical engineering Ph.D. student in Professor David Hu's lab and first author of the study. "We looked at how a pair of ants interact, and we were surprised to find that they don't actually actively swim towards each other. Even when they do, they tend to repel or ignore the other ant."

Studying small groups of ants — down to just a pair of individuals — the

team found they flail their legs when placed in water and bounce off each other. Yet, inexorably, the Cheerios effect draws them together.

Hu and his lab have long studied how fire ants weave themselves into tight, water-resistant rafts for survival. They can float atop water for weeks at a time — like huge colonies in Houston after Hurricane Harvey that drew national attention. Hu has documented that ants in these rafts create connections with an average of 14 others to form their water-repelling seal. Groups also can build towers to escape rising water.

Usually, studies of rafts involve 1,000 or more ants. This time, the team scaled

down to as few as two to understand the mechanism behind raft formation.

"I think the surprising thing here is that ants prioritize exploration, actively avoiding each other on the water surface. They instead rely on physical forces to bring them together — the Cheerios effect," said Hu, professor in the George W. Woodruff School of Mechanical Engineering and the School of Biological Sciences. "Previously, we only studied the change in the shape of the raft once formed; we never asked how ants find each other on the water surface." **PP**

*Joshua Stewart
Georgia Tech*

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Cheerios Effect

Ants are not heavy enough to break the surface tension and sink, but they create a slight depression in the water's surface. At its most basic, the slope of those depressions causes nearby ants to slide down next to their neighbor. That's the "Cheerios effect."



Red imported fire ants begin to form a raft

A Tale of Two

Formosan

Ben Hottel

HOMES throughout Florida are under constant siege by termites, but homes are not the only target these pests are attacking. Certain termite species also target living trees, causing damage that can make them topple in high winds.

Like honey bees and ants, termites are wood-feeding insects that live in large colonies. In forests, termite colonies play an important role in nature by feeding on decaying wood found on the soil floor.

In addition to feeding on fallen trees and logs in forests, termites also feed on wood building materials found in houses. Termites have the potential to cause extensive damage to a house if given the opportunity. It is estimated that soil-dwelling termites cause an estimated \$11 billion in damage per year in the United States.

Pest control companies have long been battling termites in Florida, but an invasive termite from Asia has been particularly troublesome, not only in Florida but the rest of the southern United States. This invasive termite, called the Formosan termite, was first introduced into Florida at Hallandale Beach in 1981.

While many native termite species have colony sizes with thousands of individuals present, Formosan termites can have millions of individuals in a single colony. This large colony size allows this species to cause significantly more damage to man-made structures than other species.



Formosan termite soldier



Formosan termites are also different from native species in that they will infest living trees at a higher rate than their native counterparts. Many species of trees ranging from pine to live oak trees have been found to be infested with this species of termites.

Formosan termites feed on the hardwood — the dead center of a tree — and can end up leaving the tree hollow. After hollowing out the tree, the termites will fill in the hollowed-out area with nesting material. The hollowed-out trees are more susceptible to falling from wind damage during heavy storms.

In New Orleans, Louisiana, 75 percent of the trees that fell after a hurricane were found to have fallen due to Formosan termite-related damage. Considering that up to 100 percent of the trees in certain areas of New Orleans have been found to be infested with these termites, the structural integrity of many of these trees would be in question if a heavy storm were to pass through the city.

New Orleans is not the only city to have issues with Formosan termites infesting trees. Jacksonville discovered that many trees in the Riverside

community area of Jacksonville have Formosan termite activity. Measures are being taken in Jacksonville to work with pest control companies to help manage these termite infestations on public property.

There have been a few reports of Formosan termites infesting living trees in Leon County. Many trees in the area are at risk, including the historic live oak trees found throughout the county.

During Hurricane Hermine in 2016, many homeowners in Leon County experienced first-hand the damage falling trees can cause. Since these termites can increase the likelihood that infested trees will fall over in a storm, the spread of these termites into the live tree fauna of Leon County could lead to increased property damage in any future heavy storm event.

It is imperative to be on the lookout following storms such as Hurricane Ian to find any fallen trees that are hollowed out in the center and have a termite nest present. Trees found infested with termites should be treated by a licensed pest control professional. **PP**

Ben Hottel is Technical Services Manager for Rollins in Atlanta.

Live oak
Quercus virginiana

Termites

Both species attack living trees in Florida



Asian Subterranean

Thomas Chouvenc and Jeremiah Foley IV

THE ASIAN subterranean termite, *Coptotermes gestroi*, is an invasive termite pest species occurring in the most southeastern part of the continental United States. It is reported from the lower Florida Keys to Palm Beach County, Florida, and is considered a major structural pest throughout metropolitan southeastern Florida.

This termite pest species originates from Southeast Asia. It has been one of the most successful termite species in spreading throughout the tropics with the help of human maritime activity.

It is similar in its pest status, invasiveness, and damage potential to its close relative, the Formosan subterranean termite, *Coptotermes formosanus*, except that its distribution is solely tropical.

Coptotermes gestroi was first found in the United States in 1996 in Miami, Florida. Within 20 years it became a major structural pest throughout this urban region.

Although the initial focus on *C. gestroi* primarily has been its potential impact to structures, we want to bring attention to the importance of this pest as a threat to urban forests. The pressure from termites to mature, historical trees may be unprecedented in southeastern Florida.

Impact of Subterranean Termites to Live Trees

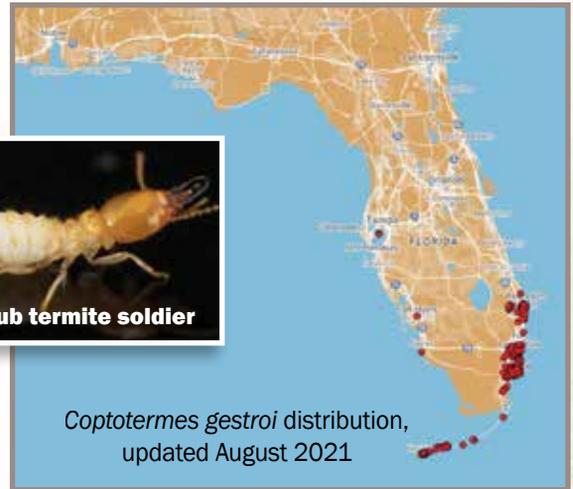
In addition to being a major structural pest, our research shows that *C. gestroi* has

the potential to become a major threat to live trees in southeastern Florida. Some of the native trees may be naïve hosts without sufficient adaptations to survive such termite pressure. Although some tree species may be able to sustain the damage from termites, our observation suggests that *C. gestroi* infestation in slash pines may ultimately be fatal. The resistograph data confirmed that live slash pines infested with *C. gestroi* sustained heavy damage corresponding to the girdling observed in cross sections of dead slash pines. Therefore, the damage that could potentially result in the death of slash pines can occur pre-mortem when termites are present. This observation and the high association rate of *C. gestroi* with declining slash pines suggest that *C. gestroi* is a major stress factor to slash pine in urban southeastern Florida. This may be partially because wounding of live tissues puts too much stress on the trees, which are relatively slow-growing by nature. The trees may not be able to sustain the pressure of a large *C. gestroi* colony.

The Asian subterranean termite was first detected in 1996 in South Florida and has been spreading since at an alarming rate, building high-density populations throughout urban southeastern Florida. With termite densities increasing over the past few years slash pine and other susceptible trees are at risk.



Asian sub termite soldier



Coptotermes gestroi distribution, updated August 2021

More problematic, our survey suggests that in residential areas, 10% of the surveyed slash pines already were dead — potentially as a result of termite damage — but this figure may be conservative.

Protecting Pine Trees From Termite Damage

Preventive Treatments

There are at least two different approaches that can be considered and that reflect current protocols for preventative structural treatments against subterranean termites. The first would be the use of a chemical barrier using liquid termiticides, so that a foraging colony of *C. gestroi* in the soil would be denied access to the tree in the first place. However, the surviving termite population may still affect nearby untreated areas such as trees and structures. Second would be the use of termite baits, placed in the soil around the tree. Such termite baits would be fed upon by foraging termites, and result in colony elimination over time.

Continued



Slash pine *Pinus elliotii*



Termite mud covers the surface of a pine tree



Dead pine bark was removed to reveal termite feces and carton hidden under the bark layer

Two different active infestations of *Coptotermes gestroi* in slash pines.

Loose, shaggy pine tree bark appears to be a good entry point for alates during their dispersal flight. Most pine trees that we surveyed within a few weeks after major dispersal flight events had *C. gestroi* wings present underneath the outer layer of the bark, suggesting that alates may have the opportunity to establish colonies directly in live trees. Although there are no research data to support trunk treatments with persistent insecticides to prevent termites from attacking live trees, this approach is commonly used to prevent attack by bark beetles in the urban forest, so it might also be an effective method to reduce the risk of infestation by these termites.

Remedial Treatments

While the use of a liquid termiticide in the ground surrounding a tree may prevent the flow of termites in and out of an infested tree, it may not prevent damage to the tree. Nonwater-soluble termiticides such as fipronil would not be picked up by the tree, and soluble termiticides such as imidacloprid may partially become systemic to the trees in very high dosage, but effectiveness is unlikely.

In addition, if the termite population is restricted to the tree because of their inability to forage out in the soil owing to the presence of pesticides in the soil, it might intensify the damage to the tree itself, and speed up its potential death.

Because of the type of damage to pine trees by *C. gestroi*, there is no central cavity that could be used to inject a foam formulation throughout the tree as can be done with hardwood trees with central cavities. Insecticide injections and implants are sometimes used to protect trees or kill wood-boring insects. Although there are no data on this application for termites, it also should be considered.

Alternatively, termite baits could be used in the ground around the tree, but the time required for colony elimination might rely on the ability of the colony to detect the baits. One possible way to reduce this time would be to use above-ground bait stations. Such a product could be placed directly on the surface of the tree where termite activity was detected. This would allow direct access and feeding of the colony on the bait, reducing the overall time needed for colony elimination, thereby increasing the tree's chance for survival.

Continued on Page 20

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Risky Business

Allen Fugler

Pest Control's Recovery from Hurricane Ian

AS I WRITE this one month removed from the landfall of Hurricane Ian, I am heartened to learn that the pest profession in southwest and central Florida largely avoided personal harm and severe damage. As a longtime Gulf Coast resident and Hurricane Katrina survivor, it's wonderful to see the associations and individual industry members rally to help those most impacted.

From my personal experience, getting your business back after a hurricane is a time consuming and potentially frustrating experience. Remember that among the first steps to recovery after a storm is filing a claim with your insurance providers and discussing the claim with adjusters.

Your hurricane season preparation will largely direct the success of your recovery. Implementation of a comprehensive hurricane response plan designed for your business will ensure an effective and efficient recovery. Adherence to these procedures will assure safety for your team and bridging support for your business that will get you through the toughest times.

1. Keep in communication

Hurricanes disrupt communications with downed cell phone towers and power outages. Maintenance of internal and external communications is a key to successful recovery, especially with these key parties:

- Remaining personnel: Keep in touch with employees who may have remained onsite or nearby for updates on their condition and any supplies they need.
- Your insurance brokers: Contact them to begin the claims process. They have the experience and resources you may need.
- Displaced personnel: Communicating through alternate means such as your company website, text messages, social media may be necessary until phone service is re-established.
- Vendors and customers: Updating your

website and social media can be reliable stop-gap communications method. Updated recorded messages on voicemail can convey daily changes to your business's status.

- Utilities and your local, state and federal government: they can provide locations for resources, power/phone service status, and other vital support information.

2. Safety first!

Ensuring the safety of employees the first and highest priority. Protect yourself and your helpers during the days and weeks of post-storm recovery by:

- Properly train all onsite personnel.
- Provide and insist that everyone wear appropriate PPE, including safety boots, hard hats, glasses, and gloves.
- Have enough water and disinfecting supplies on hand.
- Especially important in Florida, be cognizant of heat stress, and monitor physical stress on employees.
- Be aware of any exposures to toxic environments and disease. Providing protective masks may help reduce these risks, but identify, isolate and mitigate any spilled product, overflowing sewage, mosquito breeding areas, and other similar potential sources of exposure and disease.

3. Know about hurricane hazards

While many longtime Floridians "know the drill," please don't take the hazards that flooding and wind damage can create for granted:

- Live electrical wires
- Broken glass and sharp metal
- Leaking fuel gases or flammable liquids
- Shifting building features or contents
- Hardscape areas undermined by storm surge
- Flammable materials in storage tanks that create a combustible vapor environment
- Animals that may have relocated during

the disaster — think floating balls of fire ants and the ever-present photos of gators gliding down flooded streets.

4. Document all damage

Smartphone photos and video can document conditions. Carry a portable battery pack to supplement a dead battery, too. Document damage to the structure, loss of inventory, supplies, furniture, contents, equipment and business losses from interruption. Keep track of your expenses for possible reimbursement.

5. Make a property assessment

Perform a thorough examination of your facilities and/or systems when it is safe to do so. Look for impaired building and fire protection systems, and damaged utilities that can present new hazards.

Clear roof drains, ground-level catch basins and gutters and downspouts, especially if more rain is expected. Set up sandbags at first-floor doors and entrances if more rain is forecasted due to trailing rain bands.

6. Prioritize repairs

After you've filed a claim with your insurance broker and had a discussion with the claim adjuster, prioritize repairs that impact your ability to resume operations. Establish repair priorities, including the building envelope, utilities and fire protection systems.

Access to credible contractors may be an issue, so you may want to establish relationships with a few local businesses in the off season — a viable source could be from contractors already used for minor termite damage repairs.

7. Salvage safely

Separate damaged goods and save them separately until they are properly documented.

Continued on Page 28



This large oak tree was hollowed out by *C. gestroi*, with presence of carton at the center of the tree (arrow). Property damage resulted from the tree's structural collapse during Hurricane Irma in September 2017.

Termites, continued from Page 18

A full field study is needed to confirm the efficacy or lack thereof for each protocol to provide protection to pine trees, but given the biology of this termite species and the type of damage it does to pine trees, above-ground baits might be the favored option.

Ultimately, an injectable fluid bait formulation could be used and applied directly in active termite galleries of infested pine trees, but no commercial product is currently available.

Conclusion

If *C. gestroi* termite colonies increase their population density in trees, it is possible for mature colonies to move to nearby structures from their underground foraging galleries and cause structural damage after they have fed upon the tree. This underscores the fact that IPM strategies to protect structures should not rely solely on temporarily keeping termites outside of structures. Rather, strategies should involve colony elimination within the surrounding environment to prevent future potential damage.

Aside from structural damage, *C. gestroi* may have a strong negative effect on the current urban forest canopy of southeastern Florida. Many live trees seem to be directly affected by the feeding damage of this termite species, and the rate of infestation in pine trees and other trees may be critical in the near future for the overall survival of a diverse urban tree canopy.

Many of the pine trees currently present in the urban landscape were part of the original environment when urban development occurred more than half a century ago. These trees represent a legacy of the native southeastern Florida landscape. The rapid loss of such trees due to termite feeding activity may, therefore, have irreversible negative consequences for the health and sustainability of affected urban forest canopy.

The continuous feeding damage to live trees also may have an important indirect

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effect. Trees weakened by Formosan subterranean termite colonies may break or be uprooted during storms. As we advocate that the effects of *C. gestroi* on live trees in southeastern Florida are analogous to the impacts of *C. formosanus* on live trees in Louisiana, we raise major concerns about the fate of these weakened trees in the event of a major hurricane landfall in southeastern Florida. In 2005, Hurricane Wilma brought major damage to southeastern Florida. Many trees have been severely compromised by *C. gestroi* feeding damage over the 17 years since Wilma.

As Hurricane Irma struck Florida in September 2017, the center of the storm spared Broward County. Most oak trees lost only a few branches if any. However, we monitored several large oak trees that completely collapsed during the storm. Out of three collapsed oak trees found, all were hollowed out by *C. gestroi*, confirming that the tree structures were compromised.

Such falling and breaking trees resulted in property damage. Therefore, in addition to potentially killing slash pines, *C. gestroi* also can affect other tree species indirectly and negatively affect the South Florida tree canopy as a whole, as previously observed in Louisiana with *C. formosanus*, and be a hazard to people and properties in urban landscapes. Therefore, we suggest that the presence of *C. gestroi* in trees is a time-sensitive issue because in addition to its potential ability to directly kill trees, it also can indirectly increase the destructive power of major storms by weakening the structural integrity of the trees.

There is an incentive to save large trees, including many native trees such as gumbo limbo, live oak, sabal palm, slash pine and others, which comprise a large portion of the native urban forest canopy of southeastern Florida. The loss of such urban forest would have direct negative effects on the local ecosystem, and a long term economic impact, as high densities of *C. gestroi* colonies will ultimately result in structural damage. Managing populations of *C. gestroi* in urban southeastern Florida through a comprehensive IPM program is very much needed. **PP**

Thomas Chouvenec is Assistant Professor in urban entomology specializing in biology, ecology, evolution and control of termites at UF/IFAS Ft. Lauderdale Research and Education Center.



Photos by Lyle J. Buss



Kissing bug adult

Nymph and adult

Adult

‘Kissing Bug’ Lookalikes

Lyle J. Buss

SOMETIMES we get questions about pests that make it into the local news, such as lovebugs, “murder hornets,” and lately the giant African land snail. One insect that has made its rounds in the news is the “kissing bug.” Kissing bugs feed on the blood of mammals, sometimes around the lips, and are notoriously known as vectors of the parasite that causes Chagas disease. Most of them belong to the genus *Triatoma* in the assassin bug family, Reduviidae. There are two species of *Triatoma* that occur in the eastern United States, and many more species in the southwestern United States and down through Central and South America. Thankfully, the *Triatoma* species in North America are poor vectors of the Chagas parasite to people, so the chances of contracting Chagas disease here is very low.

Most people haven’t actually seen a kissing bug before, so we shouldn’t be surprised that many other insects get mistaken for kissing bugs. One of my clients killed a large bug in his house and noticed it was filled with blood. With the help of Google, he identified it as a *Triatoma* species. Wanting to get confirmation, he brought the smashed insect to the UF Entomology & Nematology Department. When I examined the specimen, I recognized it as a *Psorophora* sp. — a type of large mosquito!

The common “kissing bug” species in the eastern United States is *Triatoma sanguisuga*, and it goes by the official common name bloodsucking conenose. It is about ¾ inch long and has characteristic orange and black markings over its body. There are many other large assassin bug species in our area that sometimes get mistaken for *Triatoma* bugs. One of the photos shows four other species that clients have sent me as suspected kissing bugs. Of those, only the *Triatoma* feeds on blood. All of the other species prey on various insects. The most common species is the wheel bug. It is active during the day, and is often seen on vegetation and buildings. The adult is large, at least an inch long, with a crest on its thorax that resembles a cogwheel. Wheel bugs and other assassin bugs have a painful defensive bite, so it is best not to handle them. **PP**

Lyle J. Buss, Scientific Photographer, manages the Insect Identification Lab at the UF/IFAS Entomology and Nematology Department.

Emergency Loans are Available for Small Businesses Impacted by Hurricane Ian

Compiled by Andrew Ropicki,
Marine Resource Economics
Specialist, UF/IFAS Extension
Florida Sea Grant

FLORIDA and federal government have emergency loan programs for small businesses impacted by Hurricane Ian. At right is basic information on three of the loan programs.

Additional information on the Florida Small Business Emergency Bridge Loan Program is available at 1 (833) 832-4494. The SBA disaster assistance customer service center is available at 1 (800) 659-2955.

Florida Small Business Emergency Bridge Loan Program

Short-term, zero-interest working capital loans to bridge the gap between the time a disaster impacts a business and when a business has secured longer term recovery funding such as federally or commercially available loans, insurance claims or other resources.

Max Amount: \$50,000

Loan Term: 1 year

Interest Rate: 0%

Call 1 (833) 832-4494 or visit <https://deosera.force.com/RebuildFloridaBusinessLoanFund/s/>

SBA Physical Disaster Loan

Loans for impacted small businesses located in declared disaster areas to repair or replace disaster-damaged property owned by the business, including real estate, inventories, supplies, machinery and equipment. Businesses of any size are eligible. Private, nonprofit organizations are also eligible. **Max Amount:** \$2 million (between both SBA programs) **Loan Term:** Up to 30 years **Interest Rate:** Varies

Call 1 (800) 659-2955 or visit <https://disasterloanassistance.sba.gov/ela/s/article/Business-Physical-Disaster-Loans>

SBA Economic Injury Disaster Loan

Loans for impacted small businesses located in declared disaster areas that are unable to meet obligations and pay ordinary and necessary operating expenses. Provide working capital to help small businesses survive until normal operations resume after a disaster.

Max Amount: \$2 million (between both SBA programs)

Loan Term: Up to 30 years

Interest Rate: Up to 4%

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Tricia Shears

Florida water moccasin
VENOMOUS



Dennis Church

Florida banded water snake
NONVENOMOUS

Dealing With Snakes After a Storm

PROBLEMS WITH SNAKES

LIKE OTHER residents in the path of a major storm, snakes become displaced and left homeless. As a result, they may seek shelter and food inside houses, storage sheds, barns, and other buildings. Damaged structures are more accessible to snakes, and flooding may allow some snakes to swim or deposit them

indoors. Displaced snakes may also be found under debris scattered by the storm or in debris piles created during the cleanup effort. It's important to realize that both venomous and nonvenomous snakes are beneficial to people because they help control rodents, which are also displaced by storms.

Tips for working in areas where snakes may be found:

Outdoors

- ✓ Wear heavy work gloves, tall boots, and long pants or snake leggings (if available) when working in areas cluttered with debris. Avoid wearing shorts when working with debris.

Continued on next page



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M. Waldvogel, NC State

ABOVE: Flooding may result in snakes seeking shelter inside homes — such as this rat snake in an attic.



Corn snake

- ✓ Watch where you place your hands and feet when removing or cleaning debris.
- ✓ Look carefully before you place your fingers in and under piles of debris that have been undisturbed at for any length of time.
- ✓ Watch for snakes sunning on fallen trees, limbs, and other debris.
- ✓ If you encounter a snake, step back and allow the animal to proceed on its way. Snakes are not usually fast-moving animals, and you should be able to move out of their way. Snakes will often move out of the way, but watch where they go in case it's another debris pile or under a house, car, or other object.
- ✗ Never step over logs or other obstacles unless you can see the other side.

Indoors

- ✓ If you find a snake in your house, don't panic. Try to confine the snake to a small area of the house.
- ✓ Nonvenomous snakes can be captured by pinning the snake down with a long stick or pole, preferably forked at one end, and then removed by scooping up with a flat-blade shovel.
- ✓ If you are uncomfortable about removing the snake yourself, try to get help from a neighbor or someone in the community who has experience handling snakes. Local animal control staff may not be available due to other emergencies.

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M. Walbrugel, NC State

Piles of storm debris provide harborage for snakes and other animals.

- ✓ As a last resort, you may need to kill a venomous snake. Club it with a long stick, rod or other tool. Never attempt to kill a venomous snake with an object that brings you within the snake's striking range — typically one-third to one-half the snake's total length. A pistol or rifle may seem to be a simple way to get rid of snake, but discharging a firearm in or around areas where people are cleaning up storm debris is dangerous, potentially lethal, and often illegal.
- ✓ All openings around the house ¼-inch and larger should be sealed to exclude snakes and other unwanted wildlife. Check areas such as corners of doors and windows, crawlspace doors, gaps around water pipes, and electrical service entrances. To exclude snakes, seal holes in masonry foundations with mortar or expanding foam that hardens, such as Great Stuff. Holes in wooden buildings can be sealed with fine, ⅛-inch mesh hardware cloth and/or sheet metal.
- ✓ Remove debris from around the house as soon as possible. Such clutter attracts rodents, lizards and insects on which many snakes feed and also provides shelter for the snakes. Vegetation along the foundation should be kept closely mowed.

Continued on next page

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M. Waldvogel, NC State

Watch for snakes, wasp nests, and other displaced wildlife while clearing storm debris.

✕ There are no pesticides that can be used legally to kill snakes. Repellents and traps work with limited success.

If You Are Bitten By a Snake

If you are bitten by a venomous snake, don't try to treat the bite yourself. Go to the nearest hospital or physician, or contact local emergency medical services about obtaining immediate treatment. Try to make a mental note of the appearance of the snake for identification and treatment purposes. Some nonvenomous snakes can be mistaken for copperheads and cottonmouths.

Inexpensive snake-bite kits without antivenom are more harmful than helpful, and they should be avoided. Doctors no longer recommend these kits because of infection, tissue damage from cutting, and the risk of getting venom in a cut in your mouth. Antivenom and antibiotic treatments are important to reduce the effect of the venom and the possibility of developing an infection.

Learn to identify nonvenomous and venomous snakes. Information on Florida snake identification can be obtained online at <https://edis.ifas.ufl.edu/publication/uw258>.

PP

Original publication adapted by Pete Bromley, Extension Wildlife Specialist (Ret.), NC State University, from Alabama Cooperative Extension Service information.

Michael Waldvogel is Retired Extension Specialist in Household & Structural Entomology in NCSU Entomology & Plant Pathology and Sarah Kirby is State Program Leader for Family & Consumer Sciences and Professor, NCSU Agricultural & Human Sciences.

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ABOVE: Waterlogged carpet piled in front of a house.

Filth Flies in Homes

After Storms



The common house fly is one of many filth-breeding pests that reliably appear in homes after a disaster.

WHEN electrical service is lost for an extended period, unprotected perishable foods begin to spoil. Flooding inside homes can complicate this problem. House flies, fruit flies, “scuttle flies,” and blow flies will be attracted to these decaying items.

Managing the Flies

Perishable foods that are no longer usable should be placed in trash bags and discarded in a trash can

until trash is picked up, or else taken to a sanitary landfill or other municipal disposal site. Make sure that trash cans have tight-fitting lids to exclude pests.

Fly traps and baits usually work well. However, with an abundance of other food sources such as decayed food in dumpsters and nonworking refrigerators and freezers, traps and baits will be less effective in attracting flies away from these other items.

Food or disposable food dinnerware and trash that is carelessly discarded or placed in a lidless garbage can, a can with a poorly fitting lid, or simply in bags stacked on the ground will attract displaced hungry wildlife, such as raccoons, skunks, stray dogs, and small rodents.

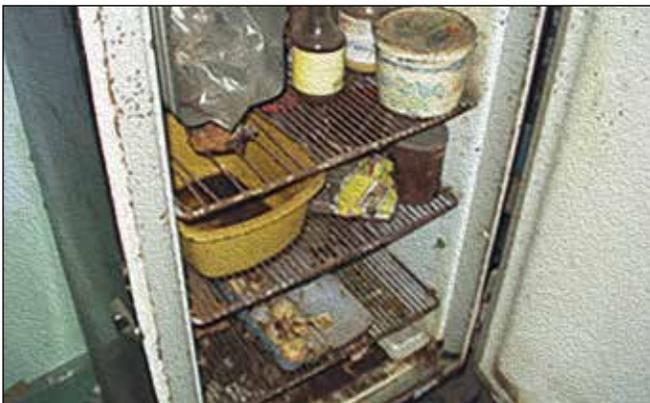
Water-soaked lawns, discarded carpeting, padded furniture, insulation, and clothing become moldy and serve as breeding grounds for fungus gnats and other flies. Water-logged compost piles, grass clippings, or bales of hay or wheat straw may attract stable flies. Depending on

the time of year, the adult flies may show up in about seven to 10 days and become a nuisance. Particularly when electrical service is disrupted or homes are flooded, people leave their windows and doors open because of the heat and to improve air circulation. Open windows and doors or ones with damaged or poorly fitting screens provide flies easy access to homes.

Aerosol insecticides may control flies temporarily, but more flies will appear once the chemical has dissipated. Pesticides must be used carefully particularly indoors and should not be applied around children and people who have respiratory problems that may be complicated by other problems, such as mold during cleanup.

Use sticky “fly strips” to trap the flies. “Pest strips” impregnated with the chemical DDVP (dichlorvos) should not be used except in rooms that are NOT occupied more than four hours daily. Keep out of reach of children and pets.

Continued on next page



Refrigerator with contaminated and rotting food.

- Avoid accumulations of combustible materials inside the building.
- Avoid storage in areas with impaired fire protection.
- Exercise caution when removing debris. Rubble can hide structural damage and removal can cause collapse. Be sure to use proper lifting techniques when removing heavy and wet items.

8. Restore your data

Since there is advance warning when a hurricane approaches, it is likely that you backed up, transferred and/or transported important business data to an alternate recovery site or secured facility. Your most critical data includes your business license, major contracts and legal documents, tax returns and financial statements, and other important business and customer documents. Following a disaster, make sure these vital records are still securely accessible from the devices you'll be using.

9. Clean and sanitize

In the damp, warm Florida environment, rapid mold and bacteria growth can create serious health concerns. Mitigating mold damage is a critical process requires early intervention.

Once the water recedes, access is granted by local government and damage is documented, cleaning can begin, either by your team or by a qualified industrial hygienist. After removing any standing water, the use of electric fans, portable dehumidifiers and water vacuums can help dry out areas, assuming your electric systems are functioning properly.

Hot water and bleach can help sanitize impervious surfaces, and ample drying time allowed. With water intrusion, upholstered

furniture, flooring and sheetrock will likely need removal and disposed of. Open walls in the drying phase is the ideal time for application of a borate material to exposed wood to retard mold growth and future WDO infestation.

Once you're operating again, review your hurricane response and recovery processes to identify successes and failures, vendor contractors and contacts. Get feedback from employees on the effectiveness of your plans. Please thank everyone who helped you recover and offer assistance and advice to others.

As part of your future preparedness, sit down with your insurance agent and review your insurance coverage:

- Commercial Property: Building values, wind coverage, Business Personal Property (contents coverage), Business Interruption coverage (net income replacement based on government actions, but not for loss of customers damaged or displaced by storms)
- Flood Insurance: a federally administered program separate coverage from commercial property coverage
- Inland Marine: truck-mounted equipment, mobile equipment, vinyl wraps; ask your broker about availability of replacement cost coverage
- Commercial Auto: covers glass and water/flood damage, depreciation applies to vehicle and vinyl wraps
- General Liability: some policies contain limited coverage for data recovery costs.

Businesses are encouraged to complete the online Business Damage Assessment tool available on www.FLORIDADISASTER.BIZ website. This information will provide valuable economic impact information to

the Department of Economic Opportunity and can help better direct resources to those business most in need.

Save these state agency contacts for future reference:

- Florida Department of Economic Opportunity: www.floridajobs.org
- Florida Division of Emergency Management: www.floridadisaster.org
- Federal Emergency Management Agency: www.ready.gov/business
- FEMA Hurricane Preparedness Kit: https://www.ready.gov/sites/default/files/2020-04/ready_business_hurricane_toolkit.pdf

On a final and personal note, I want to acknowledge the passing Ed Bordes, a longtime friend and colleague who spent over 20 years as the director of the New Orleans Mosquito and Termite Control Board. Ed was a consummate professional and gentleman, as unique as the city he loved. If you visit the Big Easy, please note the silver and brass circles on virtually every paved area of the city; they are the weather resistance caps that he invented to keep termite baits dry and palatable. Ed, Dr. Claudia Riegel, Arnie Katz, and his New York compadres and I shared some harrowing times in the immediate aftermath of Katrina, providing much needed emergency rodent control work in the still partially submerged city. I hold those difficult times, and Ed's tireless efforts, as dear memories.

Rest in peace, Edgar Bordes. **PP**

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SEWER SYSTEMS and sewer lines that are damaged by uprooted trees will attract a variety of small flies, including "scuttle flies," minute scavenger flies, and moth flies, also called drain flies. These flies will increase noticeably around damaged septic lines, damaged sewer pipes, and other waste system components. Moth flies showing up outdoors or inside may be a sign that you need to check your septic system and

crawl space for possible damage to septic lines or waste pipes.

Carcasses of animals killed in a storm or in subsequent flooding will attract house flies and blow flies in particular. Quick disposal of the carcass is critical to minimizing fly problems. However, post-storm conditions may disrupt cleanup activities and delay disposal. Listen for instructions from county or state health officials regarding what methods are considered

appropriate in your area.

For small animals domestic or wild, incineration or disposal in an appropriate landfill is preferable. In some emergency situations, local officials may approve immediate burial at least 3 feet deep, but check with your local government before burying dead animals even on private property. Do not place carcasses in dumpsters unless the city/county instructs you do so as this will only aggravate fly problems,

particularly if the dumpsters cannot be emptied quickly and regularly.

Additional problems can arise in and around livestock and horse farms. These problems can impact both farmers and surrounding neighbors as well.

PP

Michael Waldvogel is a Retired Extension Specialist in Household & Structural Entomology, NCSU Entomology & Plant Pathology.

Facts from FDACS: WDO Contract Requirements 2022

THE FIRST thing I should do is to give you the definition of a WDO, as defined in Chapter 482.021 (30). “Wood-destroying organism” means an arthropod or other living organism that damages and can reinfest seasoned wood in a structure — namely, termites, powderpost beetles, oldhouse borers, and wood-decaying fungi.

For every treatment for a WDO a contract is required, including spot treatments and treatments with no guarantees. We check the contract with the “WDO Contract Provision Review Worksheet,” which is based on Chapter 5E-14.105 and Chapter 482.226 and 227.

The first question: Is there a copy of the Consumer Notice 13692 in the file? Then, does it meet the requirements of:

5E-14.105(2) Such contract, except as provided in subsection (3) of this section, or an exact copy thereof must be given to the property owner or his authorized agent for acceptance or rejection before any portion of the work is done and before payment, in part or in full, is received by the licensee. The contract shall clearly set forth the following information:

(a) The complete name and address of the property owner or authorized agent and the complete address of the property to be treated.

(b) All buildings or structures on the property to be included for treatment.

(c) The complete name and business address of the licensee.

(d) The date upon which the written contract is entered into, the period of time covered by the contract, and renewal option, if any.

(e) The complete common name(s) of the wood-destroying organism(s) to be controlled or for which preventive treatment is intended under the contract. Any contract for the treatment or

prevention of termites must clearly state on the first page if the contract covers subterranean termites, dry wood termites, or both. If Formosan termites (*Coptotermes formosansus*), or other invasive termite species, are to be excluded from coverage, the species must be named as excluded.

(f) If an existing infestation is known to be present at the time of treatment, the treatment is for control of existing infestation.

(g) Whether or not reinspections are to be made under the contract and, if so, approximate time intervals between reinspections, and fees other than renewal fees for same, if any.

(h) The conditions under which retreatments (for reinfestation) will be made; and conditions under which repairs will be made, if any.

(i) The total maximum price to be charged for treatment service, the exact annual renewal fees to be charged under the contract, if any; and the total maximum price to be charged for structural repairs, if any, shown separately.

(j) If the performance of the work is guaranteed by any type or form of bond, the obligations of the bond shall be set forth specifically: i.e., necessary retreatments, repairs, etc., in wording identical to that in the bond itself.

(k) The signature of the licensee or his authorized representative, and the signature of the property owner or authorized agent.

Chapter 482.226(5) In addition to the notice required by subsection (4), any licensee who performs control of any wood-destroying organism shall post notice of such treatment immediately adjacent to the access to the attic or crawl area or other readily accessible area of the property treated. This notice must be at least 3 inches by 5 inches in size and must consist of a material that will last at least

3 years. It is a violation of this chapter for anyone other than the property owner to remove such notice at any time. The licensee’s name and address, the date of treatment, the name of the pesticide used, and the wood-destroying organism for which treatment was performed must be stated on the notice. The contract for treatment between the licensee and the consumer must state the location of such notice.

Chapter 482.227(2) Any contract for treatment of wood-destroying organisms must specify on the first page in bold print that it is offered for repair and retreatment or for retreatment only or that no warranty or guarantee is offered.

(3) The contract for treatment of wood-destroying organisms must specify on the first page in bold print whether there are any disclaimers, limitations, conditions, or exclusions on the licensee’s obligation to repair or re-treat the property.

Contract sections describing disclaimers, limitations, conditions, or exclusions applicable to the licensee’s obligation to repair or re-treat the property must contain headings in bold print.

(4) If a contract for treatment of wood-destroying organisms contains a disclaimer, limitation, condition, or exclusion applicable to the licensee’s obligation to repair or re-treat the property, the term “full” or “unlimited” may not be used together with the term “guarantee” or “warranty.”

These are the requirements for all WDO contracts issued. **PP**

Report by Paul Mitola, Environmental Consultant, Florida Department of Agriculture and Consumer Services

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