

# Common Social Bees and Wasps of Pennsylvania: Behavior, Lifecycle, and Management

**Social organisms live together in groups and interact with others of the same species; humans, wolves, and several species of bees and wasps are examples of social organisms.**

Social insects are defined by several characteristics; they cooperate in the care of offspring that are not their own, live in overlapping generations, and have a division of labor where only certain members of the group can reproduce. Many species of bees and wasps nest in groups but are not considered social, that behavior is called nesting aggregation. Because these insects occupy only their own nests and care for only their own young they are considered solitary insects. This article will discuss social bees and wasps that are commonly found in Pennsylvania.

## Common Social Bees and Wasps

The following is a description of social bees and wasps commonly found in Pennsylvania. Because of the differences in the life cycle and nesting behavior; management, removal, or relocation of these insects requires special considerations individualized for each species.



Bald-faced hornets have striking white markings on their faces. Photo: Michael Brattenberg

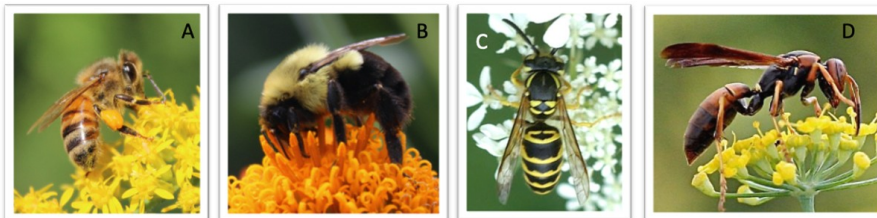


Figure 1. Honey bees (A) and bumble bees (B) represent the most common social bees in Pennsylvania. Social wasps like the yellowjacket (C), the northern paper wasp (D) are social wasps found around many homes. Images: A and B) J. Lana Mejias C) Christian Grenier D) Richard Wolfert

## Social Bees

The most common social bees in Pennsylvania are European honey bees and bumble bees. European honey bees (*Apis mellifera*) forage for pollen and nectar from a wide range of flowering plants. Pollen is used as a protein and fat source to feed young adults and developing larvae, while sugary nectar is collected as a source of carbohydrates for the adults and larvae. The nectar is transformed into honey and stored for future use. Unlike most social insects, honey bees possess the rare ability to survive winter by clustering together and generating heat. They do this by consuming the honey they produced and stored during summer.

Honey bees are cavity nesters and reproduce by swarming. During swarming, the queen and approximately half of the workers leave their former home in order to establish a new nest. The workers who remain in the original nest rear a new queen to head the colony. When a swarm departs their former home, they form a temporary cluster called a bivouac (Figure 2B). Scout bees will search the surrounding area for a suitable permanent site for the colony: they often seek hollow, enclosed spaces such as a tree cavity and occasionally inside the walls of homes. Honey bees are particularly attracted to spaces that were previously occupied by

other honey bees. This is an important consideration when removal of a honey bee colony is necessary.

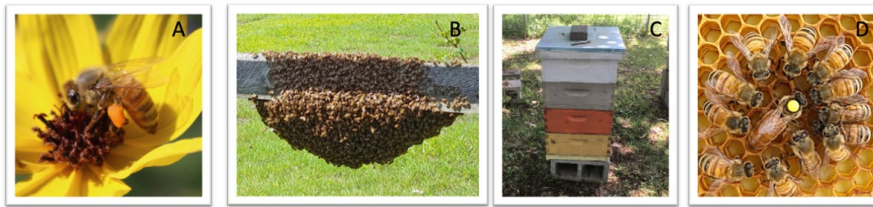


Figure 2. Honey bees are the most abundant bee in Pennsylvania and reproduce by swarming. When swarming occurs, a large group of bees will cluster for several hours or days (B) until they fly to their newly selected home. Photos: A) J. Lana Mejias B) Christine Stone C) and D) Kate Anton

Removal of honey bee colonies and their nests requires particular consideration. If a honey bee colony is inside the wall of a home there could be more than 100 pounds of honey and tens of thousands of bees, along with an extensive network of comb that contains developing bees. In some cases, the removal of very large nests requires extensive work to assure complete removal. Never attempt to seal a live colony of honey bees inside a wall. Honey bees are capable of chewing through drywall and they may emerge en masse inside a home, making a very uncomfortable situation for all inhabitants, both insect, and human alike.

Feral honey bee colonies living near homes rarely exhibit defensive behavior and can be a delight to observe. Honey bees typically only sting to protect their nests or their lives, and each individual bee can only sting once. Upon stinging, the barbed stinger becomes lodged in the target with a venom sac attached. While this is fatal to the bee, it is a powerful threat deterrent. Furthermore, the venom sac releases an alarm pheromone, which attracts more bees to help with defense.

If honey bees live within a structure, such as a home, and need to be removed, contact a local beekeeper or pest control expert. Ask if they are willing to remove the colony, or if they can refer you to another removal specialist. It is often possible to remove an entire honey bee colony and rehome it into a conventional bee hive. In some situations, the process can be extensive and should be carried out by an experienced professional in order to avoid damage to the structure while safely removing the insects. Choose professionals who are experienced with both insects and home construction to make sure the work is carried out safely and completely. It is essential that all nesting material from the colony is removed, residual comb or honey can attract future honey bee swarms or other undesirable insects.

There are 14 species of social bumble bees in Pennsylvania. The most common species is *Bombus impatiens*, the common eastern bumble bee. One species, the rusty patched bumble bee (*Bombus affinis*) is listed as endangered. Bumble bees usually nest in underground cavities, such as abandoned rodent holes, but occasionally nest higher up in cavity-like structures, such as hay bales. A colony is founded by a single queen in the spring, grows in size (in some species, up to several hundred workers) during the summer, and produces the next generation of queens and males in the late summer. The queens mate in the fall and overwinter individually underground. Queens are much larger than workers and are often confused with carpenter bees (*Xylocopa*). Information about carpenter bees can be found by following this link. Bumble bees are important pollinators of flowering plants, including many important agricultural crops. Unlike honey bees, bumble bees can perform “buzz pollination”, which is important for tomatoes, blueberries, and other plants. During buzz pollination, the bee holds on to the flower and buzzes her wings, the vibration shakes pollen loose.

Bumble bee nests are often well concealed and difficult to find. These docile insects rarely pose a conflict with their human neighbors. In fact, researchers who study these native bees can spend many hours or days searching the landscape for these well-hidden nests.

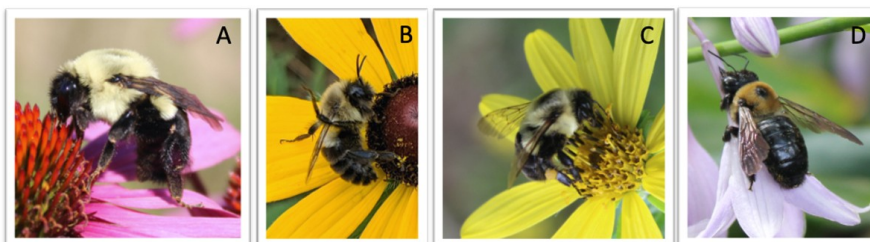


Figure 3. Bumble bees (A,B, and C) are social, ground-nesting bees who are sometimes confused with carpenter bees (D) who make nests in exposed wood. The easiest way to tell these bees apart is to look at the abdomen—carpenter bees have smooth, hairless abdomens and the entire body of bumble bees is fuzzy. Images: A, C, D) J. Lana Mejias B) Kate Anton

## Social Wasps

The most common social wasps in Pennsylvania include paper wasps (*Polistes* species), yellowjackets (*Vespula* species), bald-faced hornets (*Dolichovespula maculata*), and European hornets (*Vespula crabro*). These are all paper wasps that have different common names, they collect wood and transform it into pulp for the construction of their paper nests. Paper wasps, bald-faced hornets, and European hornets build their nests above ground, while yellowjackets typically excavate nests underground (although they sometimes nest in above-ground structures such as in the cracks of stone walls that resemble underground habitats). Social wasps can be aggressive when defending their nest and females can deliver repeated stings when threatened. This is in contrast with honey bees, who sacrifice their life with just one sting.

Despite their protective behavior, wasps benefit farmers and gardeners by hunting and preying on herbivorous insect pests such as caterpillars, aphids, and flies. Wasps are often overlooked as pollinators, but similar to bees and butterflies, many wasp species visit flowers to drink nectar, and some even collect pollen. Some species, particularly certain yellowjackets, are attracted to food scraps, picnics, and refuse—and can be a nuisance. However, wasps are unlikely to sting unless they are defending their nest or if they are physically threatened. In most cases, wasp nests are only discovered when they occupy an inconvenient space along a path or near a home.

Please note that the Asian Giant Hornet (also called the murder hornet or sparrow hornet) has not been found in Pennsylvania, and has only been reported in Washington State. For more information on this species, and how to identify it, please refer to the Extension fact sheet [Asian Giant Hornets](#).

Northern paper wasps and European paper wasps make their nests on eaves and overhangs. Northern paper wasps are native to Pennsylvania and their coloration ranges from brown to light red. European paper wasps were introduced from Europe in the 1980s. These invasive wasps are yellow and black and may be mistaken for yellowjackets. Colonies are typically small with only a few dozen adults but can grow to over 200 under the right conditions. Paper wasps are not defensive unless their nest is threatened. The queen wasps will establish nests in May and the wasps cease reproduction in late summer. By the end of September, there are few, if any, remaining wasps.



Figure 4. Northern paper wasps (A, B, C) can vary in color from dark brown to light red. European paper wasps (D) resemble yellowjackets in appearance. Eaves and overhangs are common nesting locations. Images: A) J. Lana Mejias B) Kate Anton C) Richard Wolfert D) Steve Jacobs

Yellowjacket is the common name for wasps in the genus *Vespula*. They typically make their nests underground and sometimes nest at the base of building walls or in cracks in pavement or landscaping. There are many yellowjacket species in Pennsylvania, colonies can range in size from only a few hundred individuals to thousands of members. Some species of yellowjackets aggressively defend their nests by inflicting repeated stings while other species are more docile. Many yellowjacket species are superb hunters of pest insects, such as aphids, caterpillars, and flies that damage crops. Others are exceptional scavengers, attracted to household waste and other decomposing materials that they collect to feed their young. These wasps are one of nature's 'custodians' who, despite their bad reputation, make the environment cleaner and more enjoyable for other inhabitants. Yellowjackets are easily identified based on the color pattern of the abdomen (see [Akre et al 1981](#) and [Buck et al 2008](#) for yellowjacket identification guides).



Figure 5. There are nine species of ground-nesting yellowjackets reported in Pennsylvania, occasionally these nests can grow to thousands of individuals. Images: A) Christian Grenier B) Kirsten Pearsons C) Darin J. McNeil



Bald-faced hornets are closely related to yellowjackets, although they make their large paper nests above ground, suspended from a tree or attached to the side of buildings. Their common name comes from their striking white face. Large nests can contain more than 500 adults. Bald-faced hornets are docile when encountered away from the nest. However, they will defend their nest when it is directly threatened. When provoked, these wasps will sting repeatedly, and are capable of spraying venom at the eyes of their attacker. Bald-faced hornets hunt live insect prey, which often includes flies, yellowjackets, and other insects humans consider pests. These beneficial, pest-hunting insects should be peacefully observed, and if removal is desired, professional relocation is an alternative to eradication that is available in many areas.

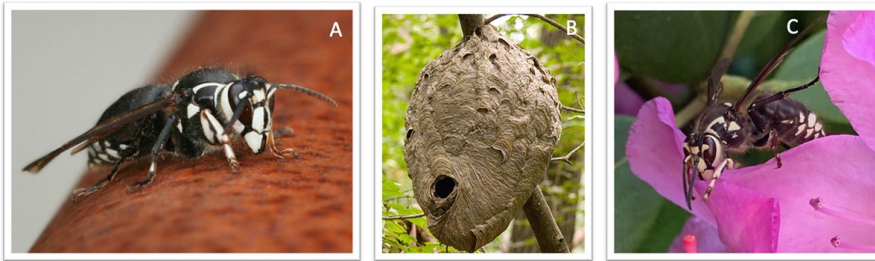


Figure 6. Bald-faced hornets have striking white markings on their faces and can construct elaborate nests in trees or on the side of buildings. These wasps are docile unless their nest is provoked. Images: A and B) Michael Brattenberg C) Darin J. McNeil

When social wasps pose a danger to their human neighbors, simple measures are available to reduce risk. Typically, bees or wasps become more defensive later in the summer and into fall, when local food resources become scarce. In response to food scarcity, social bee and wasps become increasingly protective of resources, and the colony's rate of reproduction declines. The natural life cycle of wasp colonies in Pennsylvania ends as winter approaches. To deter insects from inhabiting public spaces the following spring, repairs can be made in the winter or early spring to obstruct colony entrances and prevent future nesting. Carefully observe the insects in summer and fall and mark areas serving as entrances so it can be sealed later when the insects are no longer active. Never attempt to seal wasps inside a wall or the ground. They are capable of excavating a new entrance which could lead to an even less desirable situation, particularly if the new entrance is inside a home.

When removal is necessary, hiring a professional pest management business is the safest way to eliminate a wasp nest, particularly when the nest is located inside or on the walls of residential structures. Certified pest control experts have specialized training and access to regulated pesticides that allow the safe and complete removal of unwanted colonies. Gasoline is neither an approved nor safe method of ground-nesting wasp control, it poses a hazard to the environment and the applicator.

Non-chemical removal options can be performed by professionals or homeowners. These measures should never be carried out by individuals who are allergic or sensitive to stings. Protective clothing (long sleeves, pants, gloves, and a face veil) is required when treating or removing a colony. The hanging nests of the paper wasp can be sprayed with a jet of water from a safe distance. This method is effective in the spring and early summer, while nest building is just starting and when adult wasps are not present. The area where the nest was located should be avoided until the wasps have dispersed. For yellowjackets, flooding the nest with soapy water can effectively control some nests, though this is dependent on the size and shape of the nest. The soap will kill the queen and brood and is minimally disruptive to the local environment. Bald-faced hornets are best left alone or managed by a professional.

There are a number of social insects in Pennsylvania that can sting. When these insects take up residence near our homes, conflicts can arise. To make informed decisions about removal, homeowners should consider the nesting behavior and seasonal life cycles of these fascinating insects. The figures below provide a framework to consider when removal of social bees and wasps is required.

Additional information about insects, pest management, and pollinator health can be found by following the links below.

- [Bees in Pennsylvania: Diversity, Ecology, and Importance](#)
- [Identifying and Observing Pollinating Insects in Pennsylvania](#)
- [Asian Giant Hornets](#)
- [Penn State Extension: Pest Management and Education](#)
- [The Center for Pollinator Research](#)
- [The Eastern Carpenter Bee: Beneficial Pollinator or Unwelcome Houseguest?](#)

Pennsylvania beekeeping organizations can be found by following the link below.

- [PA beekeeping organizations](#)

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Penn State College of Agricultural Sciences research and extension programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U.S. Department of Agriculture.

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Code: ART-7017