FALL 2020

CU IN THE WOODS

Clemson Extension Forestry and Wildlife Newsletter

IDENTIFYING COPPERHEAD SNAKES

By Parker Johnson

The fear of being bitten by a snake worries many folks whether the snake is venomous or not. There are 38 species of snakes found in South Carolina, but only 6 are venomous. The venomous snakes found in South Carolina are all pit vipers with one exception – the coral snake. The pit vipers include copperhead, cottonmouth, pigmy rattlesnake, eastern diamondback rattlesnake, and timber rattlesnake. Pit vipers get their name from having a heat-sensing pit located between their eyes and their nostrils which helps these snakes locate their warm-blooded prey.

Every year, I receive a plethora of phone calls and emails asking me 1) to identify whether a snake is a copperhead and 2) what should I do with it. Many of these phone calls and emails result in the suspect snake being a similar looking, non-venomous snake with characteristics that are hard to distinguish from the copperhead. The two most common non-venomous snake species mistaken for the copperhead are the corn snake and the northern water snake.

Ways to Identify a Copperhead

There are several ways to differentiate the copperhead from these two similar-looking species, but first, let's start with a description of the copperhead.

Head

The copperhead gets its name from the coppery-tan color found mainly on its head and throughout parts of its body down to the tail. An adult copperhead's average length ranges between 2 to 3 feet but can reach 4 feet.

Since the copperhead is a pit viper, you'll notice a very distinctive triangular-shaped head. Some people call it an "arrowhead-shaped" head. These wider parts of the head allow for space to fit the snake's fangs and venom glands.

Pattern and Camouflage

Parts of the pattern of the copperhead resemble an hourglass and is one of the

UPCOMING EVENTS

Timber Tax Workshop

October 26th, 1:00 – 4:00 p.m.

Continuing Education Credits:
For CPA, Enrolled Agents and Other Tax Professionals: 3 hours of CPE
For Attorneys: 2.5 hours of CLE
For Foresters / Loggers: 2.5 hours of CFE (Cat. 1, SAF)

Register for the Event

Women Owning Woodlands Virtual Workshop

4- part workshop to engage and educate women stewardship of land.
Oct. 6th- Know Your Land
Oct. 20th- Manage Your Land
Nov. 3rd- Protect Your Resources
Nov. 17- Getting the Most from Your Land

Register for the Event

Due to COVID- 19, all of our currently planned workshops are being postponed or moved to an online format. We hope to be able to offer our great in-person workshops again soon.

Find more events:
www.clemson.edu/extension/forestry

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IDENTIFYING COPPERHEAD SNAKES CONT.

most diagnostic traits of all. The hourglass shape lays somewhat "sideways" on the copperhead's back; the wider portion of the shape starts on one side of the body, thins towards the middle-top edge of the back (closest to the spine), and then widens back out to the opposite side of the snake. To put it simply, the top of the hourglass touches the left side of the body, the bottom of the hourglass touches the right side of the body. Keep in mind that the hourglass shapes can occasionally "mismatch" and seem like they disconnect from the complete shape, especially towards the tail.

Adult venomous 'Southern copperhead' snake, *Agkistrodon contortrix.* Photo Credit: Sturgis McKeever, Georgia Southern University, Bugwood.org

Copperheads are not aggressive, nor do they go out of their way to bite humans or other unsuspecting bystanders. It all comes down to their camouflage. When curled up, their camouflage resembles a pile of fallen leaves; this helps them remain hidden from potential predators – including you. A copperhead bite typically occurs when it's least expected, after several attempts to discourage you, the "predator" from coming close. When walking through potential copperhead habitat, the snake will likely spot you first and may try to move away. As you get closer, it will curl up into its camouflage pile, blending in with fallen leaf litter on the ground. As you get closer, the copperhead will start to shake, or "rattle," its tail to resemble a rattlesnake. Get even closer, and the copperhead will lift its head to show you it's ready to bite if you keep provoking. The last and final step is a strike. Even though you may have never noticed any of the prior warnings, all the snake knows is that he gave you all warnings to stay away and that you still persisted. The bite is the last resort to defend itself from an animal much larger than itself and which it certainly doesn't see as a potential meal.

Eyes

Eye pupil shape is a very easy way of identifying not only copperheads but also most venomous snakes in South Carolina, except for the coral snake. The copperhead has a yellow eye with a black vertical and elliptical pupil, similar to that of a cat's eye. Please be advised that this does require great eyesight and an excellent viewpoint. However, don't try to get too close to the snake to see this feature, as you might put yourself in danger and ultimately provoke a strike from the snake. The venomous coral snake and all other non-venomous South Carolina snakes have round pupils.

Juvenile Yellow Tails

Juvenile copperheads are known for having a bright yellow tail that they use to lure their prey, such as frogs and small lizards.

Juvenile copperhead snake with yellow tail. Photo Credit: J.D. Wilson, University of Georgia, Savannah River Ecology Lab, srelherp.uga.edu

Ways to Differentiate Similar Species from Copperheads

Corn Snake

The corn snake is one of several North American species of rat snake. Unlike copperheads, corn snakes do not have fangs but catch and subdue their prey by constriction (squeezing and suffocating).

Corn snakes are more colorful than copperheads – they have several color variants but are typically redder in color as opposed to the copperhead's copper-tan complexion.

Corn snakes are more colorful than copperheads – they have several color variants but are typically redder in color. Photo Credit: Sturgis McKeever, Georgia Southern University, Bugwood.org

While copperheads have most of their hourglass shape on the sides of their body, corn snakes will have most of their thick "blotch" markings on the tops (or their back) of their body. Corn snakes also have a distinctive black-and-white "checkerboard" pattern on their bellies.

Corn snakes have a smaller, narrower head that aligns with their slender body angle and size, different from the copperhead's triangular head and thicker body width. It's also important to note the corn snake's round pupil that is a common characteristic of our nonvenomous snakes.

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IDENTIFYING COPPERHEAD SNAKES CONT.

Northern Water Snake

The northern water snake is a large, nonvenomous common snake native to North America. This, in my experience, is the snake most commonly mistaken for the copperhead. This is most likely because of their similar pattern and colors.

The pattern of the northern water snake is dark blotches that are narrow on the sides and wider towards the backbone. Photo Credit: Sturgis McKeever, Georgia Southern University, Bugwood.org

The pattern of the northern water snake is dark blotches that are narrow on the sides and wider towards the backbone. This differs from the copperhead's pattern that is wider on the sides and narrower towards the backbone.

Unlike copperheads, northern water snakes have round pupils, which as stated previously, is a common characteristic of nonvenomous snakes. The northern water snake also has a narrower head compared to the copperhead's "arrow-shaped" head since it lacks venom glands and fangs.

Final Comments Regarding Snakes

All snakes, venomous and nonvenomous, play a very important role in South Carolina's environmental ecosystems. Also, from a human perspective, they play a large role in controlling rodents and many other small-sized nuisance wildlife populations. This helps to decrease damage to property and the spread of disease.

The main function of fangs and venom glands in venomous snakes are for obtaining food, and they are used for defense only as a last resort. To best protect yourself against snake bites, always be aware and alert while in the woods, your backyard, or other outdoor situations.

If you are in any way uncertain whether a snake is venomous or not, always exercise precaution and do not attempt to approach or catch it. When left alone, they normally move on once they believe the threat has left. Most people are bitten or injured when either harassing or trying to approach a venomous snake too closely. In the unlikely case you are bitten by a venomous snake, it is best not to try and treat the bite yourself. The victim must stay calm and seek medical attention as soon as possible.

Snakes of any type often evoke fear, to a large degree, because they are poorly understood by the general public. Respect snakes from afar if you prefer, and you should not run into any issues that are unpreventable.

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Calhoun-Orangeburg Forest Landowners Association
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Chesterfield County Forestry Club
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Darlington/Florence Landowners Association
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Lowcountry Landowners Association
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Salkehatchie Forestry Association
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Sumter County Forest Landowner Association
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Tri-county Forestry Association
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Williamsburg County Forest Landowners Association
Contact: Sean Bowers
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Contact the Association nearest to you to find out about upcoming meetings!

HOMEMADE DEVICES TO DETERMINE BASAL AREA

By Stephen Pohlman

When a forester is helping you make decisions on your property, the measurement of basal area is very important. Basal area is simply the cross-sectional square footage of standing timber. By knowing this measurement, a forester can determine how to work with the stand to best meet your objectives.

Most foresters use a wedge prism to determine basal area (BA) for a timber stand. The wedge prism is basically a wedge of glass that is metered as a 'factor' due to the amount of refraction caused by the wedge's angle. A basal area factor (BAF) of 10 is the most commonly used. Though you can purchase wedge prisms through forestry equipment suppliers, at times a wedge prism might not be available in the field. So what else can you use?

Homemade basal area devices typically range from a pencil, a penny, a washer, a slim piece of wood, or your thumb. The only prerequisite for the device you select is that it must have a measurable width in inches. Next, multiply the width measurement by 33. Your answer will be how far from your eye you need to hold the item in front of you. To maintain an accurate distance, a measured string can be attached.

The formula to determine basal area device distance:
Width of the item in inches x 33 = Distance item is held from your eye in inches

Homemade basal area device example using a penny:
A penny measures approximately .75"
.75" x 33 = 24.75"
So, 24.75" is how far we need to hold the penny from our eye for this exercise.

The biggest difference one should remember when comparing the use of a wedge prism to their homemade basal area device is that when using a wedge prism, the prism is the plot center. When you use your homemade device, your eye is the plot center.

The exercise:

1. Choose a random spot in your timber stand. This is known as a 'plot.'
2. Your eye will be the center of the plot. With one eye closed, aim your device at 4.5' up the first tree (4.5' = diameter at breast height, aka DBH).
3. If the width of the device (i.e. the penny) is smaller than the width of the tree (meaning the tree is bigger), count it as 'in'.
4. If the width of the device is larger than the width of the tree, it is considered 'out'.
5. If the width of the device is the same width as the tree, it is considered to be 'borderline'. In my field experience, if you count every other borderline tree in your tally, you will be as accurate as possible.
6. After the first tree is determined to be 'in/out/borderline', while standing in the same place, rotate 360 degrees until every tree has been checked until you come full circle back to the first tree. It is helpful to always pick a tree that easily stands out to you and always rotate in the same direction.
7. Once the first plot is complete, randomly pick another in the same timber stand, making sure that plots do not overlap. Repeat the above by tallying only the 'in' and every other 'borderline' trees.
8. Lastly, add all of your tallied trees together. This will include all of the 'in' trees and your every other borderline trees as well. Next, divide that number by the total number of plots you took.

Then multiply that number by 10 (our Basal Area Factor). The answer is your stand's basal area.

The formula to calculate basal area:
(total # of tallied trees / total # of plots) x 10 = Basal Area for your timber stand

'In/Out/Borderline' decision illustration:
Please note that the penny is exactly 24.75" from the eye as mentioned above when measuring and determining distance to be held in front of you.

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HOMEMADE DEVICES TO DETERMINE BASAL AREA CONT.

Great timber stands typically have one thing in common, people that care about the land and a management plan. Hopefully you will find this to be a great field exercise to help you engage with your land and your forester. One thing to keep in mind, homemade devices are not as accurate as professional devices, however they are close and can provide you with a great way to monitor your timber stand over the years.

In' Tree

'Out' Tree

'Borderline' Tree

Photo Credits: Stephen Pohlman, Clemson Extension

OVERALL LUMBER MARKET AND SOUTH CAROLINA PRICE TRENDS DURING THE THIRD QUARTER

By Puskar Khanal

This quarter saw the price of lumber futures skyrocket to historically high levels of $928.50/MBF on September 1st despite the COVID-19 epidemic and the ensuring shutdowns. The swift rebound in the housing market led to an increased demand for the building commodity, but the pandemic-induced disruptions in the lumber mill operations contributed to its supply issues in this quarter. However, both sawtimber and pulpwood's stumpage prices continue to tumble despite a recent rebound in the production of wood and paper products. In general, limited mill operations, hurricane disruptions, and overall business uncertainties affect the stumpage price markets.

Sawtimber Stumpage Price:

The hardwood stumpage market has experienced a significant drop since the 1st quarter. On average, South Carolina statewide pine sawtimber prices were $21.61/ton in the 3rd quarter of 2020. For mixed hardwood sawtimber, statewide prices, on average, were $19.89/ton in this quarter.

Pulpwood Stumpage Price:

Both pine and hardwood pulpwood prices continue to decline this quarter. South Carolina statewide pine pulpwood prices, on average, were $8.85/ton in the 3rd quarter of 2020. For mixed hardwood pulpwood, the statewide stumpage prices, on average, were $7.74/ton in this quarter.

The overall economy and housing market conditions and local environments such as accessibility, terrain, sale size, tree size and quality, and distance to the nearby mills affect stumpage prices for both sawtimber and pulpwood. Properly managed trees in good health and condition tend to get paid more than unmanaged trees.

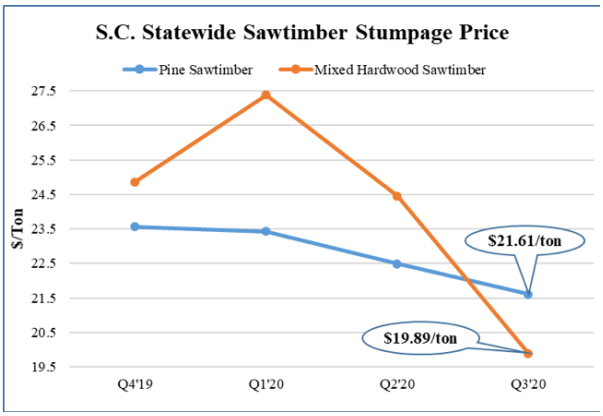


Figure 1. Graph of SC sawtimber prices

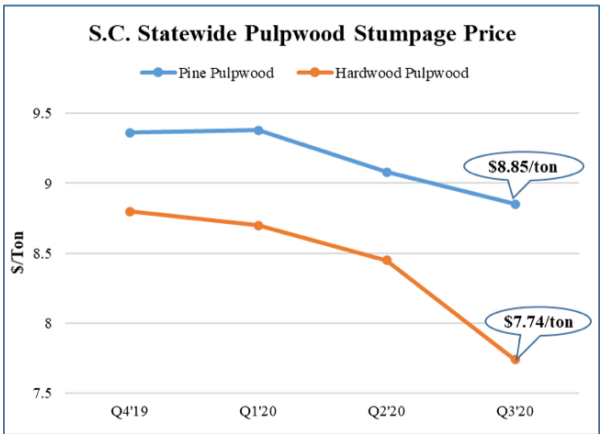


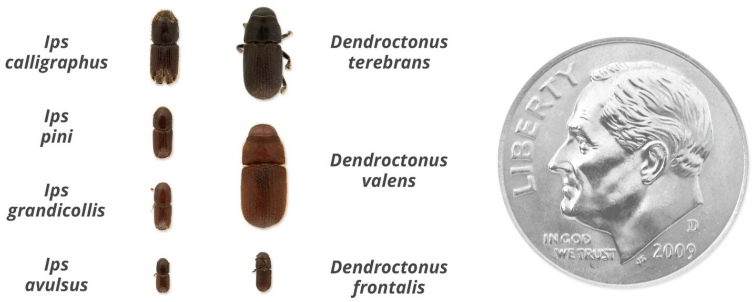
Figure 2. Graph of SC pulpwood prices

Data credit: The sawtimber and pulpwood price data included in this newsletter are published with permission from TimberMart-South Athens, GA 30605. Email: tmart@timbermart-south.com.

COMMON PINE BARK BEETLES IN URBAN SETTINGS: IDENTIFICATION AND TREATMENT OF THESE SPECIES

By Janet Steele, Molly Darr, and Derrick Phinney

Forest landowners are often more familiar than homeowners about the pests that can attack their pine trees. Because of this, the phrase "bark beetle outbreak" can strike dread as they envision entire stands of pines being wiped out by aggressive, fast-moving insect infestations. Fortunately, appropriate forest management practices such as thinning can reduce the risk of these outbreaks. Unfortunately, pine bark beetle attacks in urban settings can be just as upsetting to homeowners as they watch trees in their yard die one by one. Early signs of infestations in crowns can progress quickly from yellow needles to orange and then red ones. Often homeowners notice these signs too late to save valued yard trees. What can homeowners do if pine bark beetles are attacking the trees in their yard, and how can they prevent future infestations?



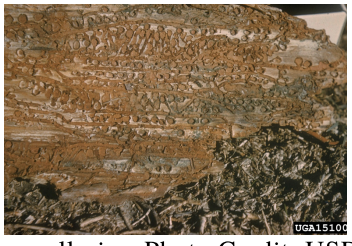
A comparison of sizes for pine bark beetles. Photo credit: Laura Costa, Southern Regional Extension Forestry

Identify the Species and Understand their Impact

Southern pine beetles, *Dendroctonus frontalis* (SPB):
These insects are extremely destructive bark beetles, despite being native to South Carolina. These beetles are smaller than a grain of rice and can destroy millions of dollars' worth of timber during periods of a severe outbreak in pine forests. They are also costly pests in developed areas and can impact pine trees in urban settings. Activity normally begins in the spring after individuals overwinter in or under the bark of previously infested trees. Pairs of SPB will most successfully attack trees that have been weakened or stressed by overcrowding, drought, disease, human impacts such as soil compaction or equipment damage to stems, or have suffered other damage like a lightning strike. As the beetles bore into a stem between the bark plates, a tree's first response is to attempt to push them out boring tunnels, or galleries by producing sap, or pitch. This will result in a small (< ½" diameter) popcorn-looking pitch tube, which can be covered in brown sawdust and seen emerging from the beetles' entrance holes. If the tree is not able to ward off the attack, the smell of this resin, as well as pheromones released by female SPB will attract other individuals. Initial attacks usually occur on the middle to upper part of a tree's stem. Trees are killed by the girdling effect of the S-shaped galleries made by the breeding pairs between the bark and the wood, and by the blue stain fungus introduced by the beetles, which clogs the xylem (water transport system). The next generation results from eggs that are laid in niches off of these galleries. The larvae eat their way through the inner and outer bark, pupate, and exit the tree through small, round holes as an adult to infest other trees. All stages of the life cycle can be found in a single tree, and 4 to 6 generations can occur in 1 year in South Carolina. When beetle numbers are high enough, even healthy pine trees will not be able to survive an attack.

Southern pine beetle egg galleries. Photo Credit: USDA Forest Service- Region 8 – Southern, USDA Forest Service, Bugwood.org

***Ips* engraver beetles:**
These beetles are 4 distinct species found in the southeastern United States, which vary in size and location of where they attack a tree along its stem. The six-spined engraver (*Ips calligraphus*), the five-spined engraver (*Ips grandicollis*), and the four-spined engraver (*Ips avulsus*) occur region wide, while the pine engraver (*Ips pini*) occurs in the Appalachian Mountain region. Like SPB, the *Ips* beetles are attracted to stressed or injured trees, but can also infest logging slash. Unlike SPB, their infestations are normally limited to clumps of trees, and they can attack up and down the stem and branches. *Ips* often attack stems already infested by SPB, but are not always associated with a SPB outbreak.
Their life cycle begins with the male boring into the face of the bark and creating a nuptial (mating) chamber in the inner bark. Pitch tubes are less common in *Ips* infestations, but brown



Ips. galleries. Photo Credit: USDA Forest Service – Region 8- Southern, USDA Forest Service, Bugwood.org

Continued on page 7

sawdust can sometimes be present. After releasing a pheromone to attract females, each of the male's mates constructs an egg gallery off of the nuptial chamber. Depending on the number of females, these galleries can form an H, I, or Y shape and run vertically up and down the stem. Larvae create perpendicular feeding galleries off of the parent galleries and feed on the inner bark until they pupate, mature, and exit the tree. As with SPB, the tree is killed by a combination of the girdling effect of the galleries and the blue stain that is introduced by the beetles. *Ips* usually have 6 to 8 generations per year. Since *Ips* can infest slash and downed trees, these materials should be removed from around adjacent healthy trees.

Black turpentine beetles, *Dendroctonus terebrans*: These beetles are much larger than the SPB or *Ips*. They get their name from their attraction to terpenes produced by wounded pine trees, such as those being worked for turpentine. Infestation by these beetles is often secondary to some other insect attack, disease, wound, or condition which has weakened or stressed a tree. The large pitch tubes created by the insect are usually located on the lower 10 to 12 feet of the pine stem. Their egg galleries are found running down the stem from the point of entry. Because larvae do not form their own feeding galleries, they feed randomly in groups on the inner bark and create large patches of excavated areas. They also mature more slowly than the other bark beetle species, resulting in 2 to 4 generations per year. Unlike other pine bark beetles, the black turpentine beetle attacks scattered trees in very low numbers, and light attacks may kill only localized sections of phloem tissue. However, if the tree is already stressed from other species of bark beetles, or there are numerous attacks per stem, tree mortality may occur.

Black turpentine beetle pitch tubes are larger compared to those of other bark beetles. Photo Credit: Janet Steele, Clemson Cooperative Extension Service

Reducing the Risk of Pine Bark Beetles to Urban Trees

As with many tree health concerns, preventative measures are your best defense against pest infestation. There is no guarantee that homeowners will be able to protect all of their yard trees in periods of severe pine bark beetle outbreaks. However, steps can be taken to improve the overall health of these trees to increase their chances of surviving an attack. The first step is to limit the amount of impact a tree suffers from day-to-day activities in the yard. This includes protecting tree trunks and roots from getting damaged by lawn maintenance equipment like lawnmower decks and weed eater string, and ensuring soil around trees is not compacted by vehicle traffic. Also, increasing watering during times of dry weather and improving the moisture holding capacity of soil by mulching around the base of the tree instead of maintaining it in grass will improve tree health under dry conditions. Removing injured or diseased trees will decrease the risk of pine bark beetles being attracted to an area. However, care should be taken not to damage neighboring trees when trees are taken down since fresh wounds can also attract a wave of pine bark beetle activity.

Several chemical treatments are labeled to prevent the spread of pine bark beetles from an infested tree to healthy neighboring trees. However, since all areas of the pine stems prone to attack must be treated, this can be very expensive when full tree heights must be sprayed with contact insecticides. Systemic treatments may have some positive affect, but they can also be costly and require the herbicide to be injected into the tree. Choosing the right insecticide and application method should only be done by consulting a trained professional. Contact your local state forester or Clemson Extension office if you think you have a pine bark beetle infestation. It is important to remember that any of these treatments will only be effective on healthy trees. Stems that are already showing signs of infestation, such as changing needle color, pitch tubes, or exit holes are already infested and will not benefit from treatment.

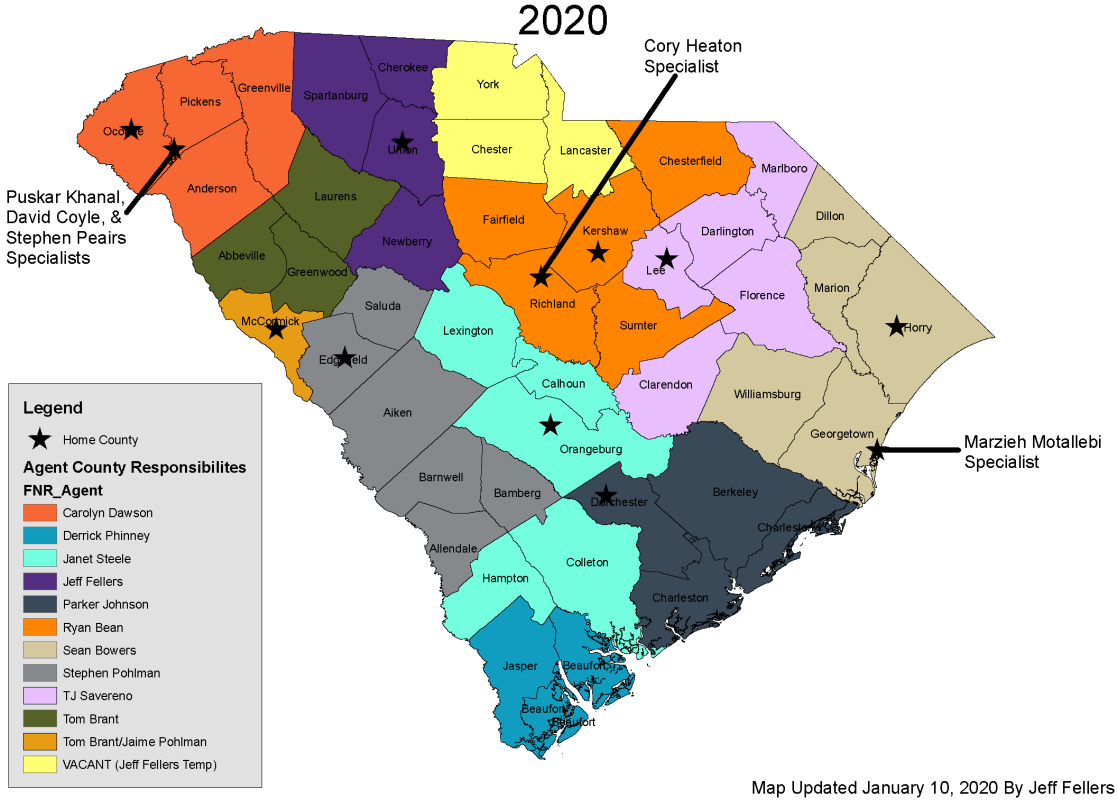
Resources:

Coyle DR, Shelf AB, Floyd JD, Riggins JJ. Ips Bark Beetles in the Southeastern US. Forest Health: Southern Regional Extension Forestry. 2016 Jun [accessed 2020 Apr 6]. http://southernforesthealth.net/insects/ips-bark-beetle/ips-bark-beetles-in-the-southeastern-u.s

Frank S, Baker J, Bambara S. Southern Pine Beetle: NC State Extension Publications. Southern Pine Beetle | NC State Extension Publications. [accessed 2020 Apr 6]. https://content.ces.ncsu.edu/southern-pine-beetle

Identification of Bark Beetles: Bark Beetles of Southern Pines. [accessed 2020 Apr 6]. https://www.barkbeetles.org/general/idbeetls.html

Forestry & Wildlife Agent Coverage Across South Carolina 2020



Map Updated January 10, 2020 By Jeff Fellers

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Cory Heaton	Wildlife Management Specialist
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Marzieh Motallebi	Ecological Economics and Carbon Credits Specialist
Stephen Peairs	Forestry, Silviculture, and Hardwood Management Specialist

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