

Video	Audio
	<p>&gt;&gt;<b>MALE NARRATOR:</b>  <b>WITH OVER 6 MILLION SPECIES CRAWLING AROUND, INSECTS ARE THE TRUE RULERS OF THE EARTH. ON THIS EPISODE, WE’LL LEARN ABOUT SOME OF GEORGIA’S BUGS, PLUS, WE’LL LEARN TO TIE A FLY AND GO FLY FISHING FOR TROUT. COMING UP ON GEORGIA OUTDOORS</b></p>
	<p>&gt;&gt;<b>NARRATOR</b>  <b>NO GROUP WITHIN THE ANIMAL KINGDOM IS AS PERVASIVE AS THE INSECT. FROM THE BEAUTIFUL, TO THE NOT SO BEAUTIFUL, THESE 6 LEGGED CREATURES INHABIT NEARLY EVERY SQUARE FOOT OF OUR LANDSCAPE. THOUGH WE OFTEN DON’T NOTICE THEM UNTIL THEY INVADE OUR HOMES OR GARDENS, THEY ARE CONSTANTLY AT WORK: EATING, WORKING AND YES – MULTIPLYING. EACH YEAR, THE UNIVERSITY OF GEORGIA AND THE STATE BOTANICAL GARDENS HOST AN UNUSUAL EVENT TO HONOR THESE ARTHROPODS – THE INSECTIVAL WHERE YOU CAN GET AN UP CLOSE LOOK AT SOME OF THESE INVERTEBRATES, CATCH A BUG RACE, OR FOR THOSE WITH AN ADVENTURESOME PALATE, MAYBE EVEN HAVE A TASTE OF ONE!</b></p>
	<p>&gt;&gt;Kudon: About 30 years ago i did a seminar on cooking insects and that was the first time i did it and I’ve been doing it ever since.  &gt;&gt;(To Group) You’re going to brave? This is delicious food. You’re brave if you don’t eat it!  &gt;&gt;The fun thing about it is every time we do this, we come up with new recipes, new ways to cook insects. We take feta cheese and garbanzo beans with some oatmeal and we add our finest ground roast cricket abdomens and some garlic and pepper.</p>

	<p>We sauté it in olive oil with a slice garlic of and add some lime and then we serve it between whole wheat bread with a caper on top, my adobo cranberry sauce and this is black bean salsa salad with meal worm crunchies.</p> <p>&gt;&gt;Man (to Kudon): Give me a worm. I gotta at least have a worm.</p> <p>&gt;&gt;Kudon (to Man): There's one in there.</p> <p>&gt;&gt;The first reaction is "Ick!" But when they taste it, people are surprised because actually what we try to do is get things that taste very good and they usually like it. And the kids, most kids when they taste it, you can't stop them from eating it because it's pizza, it's chocolate chip cookies.</p> <p>They are low in a lot of the fats that cause problems for people so they're a good source of protein. Meal worms are easy to prepare. You know, once you get them, all you have to do is really rinse then and cook them. And if you just fry them in a little oil and add some salt, you call them southern fried meal worms. They taste nutty and you can eat them while you're watching TV.</p> <p>&gt;&gt; (to girl): Now tell the truth. Did you like that? Was it good?</p>
	<p><b>&gt;&gt;NARRATOR: INSECTS DON'T HAVE TO BE SAUTÉED TO BE INTERESTING. WE'VE ASKED HEATHER HEIMER, A TEACHER AT FERNBANK SCIENCE CENTER, TO TEACH US A LITTLE ABOUT <i>LIVE</i> INSECTS.</b></p>
	<p>&gt;&gt;Heimer: An insect is a type of invertebrate. It's in the arthropod group. All arthropods have a couple things in common. They have jointed appendages, which means, basically, they have legs that can bend, and most importantly, they have an exoskeleton, which is like a suit of armor that covers the entire body of the animal and offers them protection.</p>
	<p><b>&gt;&gt;NARRATOR: OTHER MEMBERS OF THE ARTHROPOD GROUP INCLUDE THE AQUATIC CRUSTACEANS LIKE LOBSTERS AND</b></p>

	<p><b>CRAYFISH, CENTIPEDES AND MILLIPEDES, AND THE SECOND MOST POPULOUS GROUP NEXT TO INSECTS, THE ARACHNIDS, WHICH INCLUDE TICKS, SCORPIONS AND, OF COURSE, THE SPIDER. SPIDERS OFTEN INVOKE OUR FEAR, BUT THEY ARE IMPORTANT MEMBERS OF THE ECOSYSTEM.</b></p>
	<p>&gt;&gt;Heimer: In Georgia we have many different types of spiders. Of course we have some spiders that build beautiful webs. Some spiders don't even make webs at all. Many spiders just live on the ground, in the grass, in burrows. There's water spiders. There's all sorts of different habitats that they might be found in. and it's true that all spiders, with the exception of just a few in the world, are venomous. But most of them do not have a bite that can harm a human, either because the venom is too mild or because their fangs really can't penetrate our skin. So the only two we really have to worry about are the black widow spider and the brown recluse spider. Those are two that actually do have a strong enough venom to cause us a little bit of trouble. But usually if you just get to a doctor and get treated quickly they're not usually a deadly spider. And they do tend to be pretty secretive and not ones that we encounter very often, so there's really not too much to be afraid of if you see a spider in your home.</p>
	<p><b>&gt;&gt;NARRATOR: THE EASIEST WAY TO TELL AN ARACHNID FROM AN INSECT IS BY LEG COUNT. ARACHNIDS HAVE EIGHT LEGS, WHEREAS INSECTS HAVE ONLY 6, AND THE INSECT GROUP IS BY FAR THE MOST POPULOUS ANIMAL GROUP ON THE PLANET.</b></p>
	<p>&gt;&gt;Heimer: Insects are grouped into different orders, where each order is going to have certain things in common. Some examples would be ants and bees and wasps, all in a group. Butterflies and moths are grouped together. And of course, then there's the largest insect order, the beetles.</p>
	<p><b>&gt;&gt;Narrator: With over 200 Million insects for every human on earth, these 6-legged creatures</b></p>

	<p><b>are everywhere. Some species such as bees, ants, and wasps build intricate nests and have developed complex social systems. Others lead more solitary lives. Georgia is home to a variety of fascinating insects</b></p>
	<p>&gt;&gt;Heimer: Because Georgia is so warm, we do have a wide variety of different type of insects, and insects can occupy habitats, um, any place from a very dry habitat to actually in the water, up in the trees, under the ground, and pretty much all over our state. A lot of times in the summers we do hear a loud buzzing the trees and those are the cicadas, and they are very common here in Georgia. And a lot of children are familiar with them by finding little exoskeletons, little molts stuck to the sides of trees.</p> <p>Another really interesting insect are the water striders that we see very often if you ever go out canoeing or you have a pond behind your house. You may see little insects that look they're almost skating on top of the water, and what they do is by being so light weight and by spreading their legs out far like that, they're displacing their body weight to the point that they can actually move around on the surface tension that exists between the water molecules. And so, they actually will use little bits of trembling of their feet to communicate by rippling the water with each other and also to avoid collision.</p> <p>One really interesting animal I think of when I think of insects is the dragonfly. They really are the best fliers in the insect worlds. Um, they've been clocked up to thirty-five miles an hour. They can swoop, dive, change direction in an instant, and they've actually been studied even by some military in the U.S. They put them in wind tunnels to try to figure out ways to design helicopters and airplanes better by looking at the way that they fly. They're also sometimes known as mosquito hawks because they are such great predators of mosquitoes. So, they're wonderful to have around and of course they use their flying skills to be able to catch mosquitoes on the wing, which means in flight.</p>

	<p><b>&gt;&gt;Narrator: Insects are pretty low on the food chain, so many have developed creative ways to avoid becoming a tasty meal.</b></p> <p>&gt;&gt;Heimer: A lot of insects do mimic other things, perhaps to frighten away predators. Um, sometimes insects will have things that look like big eyes on them to hopefully scare away a predator into thinking that it's the face of some large animal instead of a small insect. And sometimes insects will look like other insects that are dangerous even when they themselves aren't. But there are a lot of insects that have natural defenses, like, of course, bites and stings also just bright coloration to warn of toxic chemicals that might be in their body that make them bad to eat. Probably the most important thing that they use to protect themselves is camouflage; not having bright colors but having drab colors sometimes that blend in really well with the surrounding environment, like the leaves and the trees on the ground or perhaps matching the color of bark that they sit on or a particular flower.</p> <p>Praying mantises are another really interesting insect that we do have quite a few of around in Georgia. They are a carnivorous insect, meaning that they do eat other insects, and they're excellent hunters. They have really good eyesight; they're very maneuverable, very fast when they need to be. Of course, they have an excellent way to camouflage themselves by looking like a stick and blending in, so that a lot of times the poor insect that it catches, the prey never saw it coming because it did just think it just landed beside a stick.</p>
	<p><b>&gt;&gt;Narrator: In addition to other insects, praying mantises have been known to eat frogs, small rodents, and even birds. In fact, not even other mantids are safe. After mating, a female praying mantis may make a meal of the male.</b></p>
	<p>&gt;&gt;Heimer: A lot of insects, of course, are nocturnal; they come out at night. So it's also a good time for a lot of nocturnal animals that come out at night that feed on insects too. A lot of the nighttime sounds that we're used to hearing are made by insects like crickets and katydids. Of course,</p>

	<p>we're all used to seeing moths, especially maybe around our porch lights outside because they are attracted to the light.</p>
	<p>&gt;&gt;<b>NARRATOR:</b>  <b>ONE GREAT WAY TO OBSERVE A VARIETY OF MOTHS IS BY HANGING UP A WHITE SHEET IN YOUR BACKYARD. THIS IS ONE OF JAMES ADAMS FAVORITE TACTICS TO ATTRACT NOCTURNAL INSECTS. AS A LEPIDOPTERIST, HE STUDIES BOTH MOTHS AND BUTTERFLIES, BUT TONIGHT HE'S GIVING HIS FAMILY A LOOK AT SOME OF HIS FAVORITE MOTHS.</b></p> <p>&gt;&gt;Adams: Probably the reason why moths are nocturnal is because to be diurnal means, even if you are brown or gray or green, if you're diurnal, you've got to deal with those daytime predators. And the fact that you've got to fly around exposes you to that predation. You've got to have some way of defending against predators. There have been some people who have suggested that the first butterfly had to be a distasteful one because of the fact that if you're distasteful—and by “distasteful” I mean that they've got chemicals in their body that make the birds barf literally—it's enough to remind them next time they see this pattern to ignore it; just leave it alone. The moth butterfly division is a little bit artificial actually because if you look at the Lepidoptera tree of life, kind of, the butterflies are sort of like one specialized group that's come up out of the middle of the tree. And it's sort of the one group that has become really, really specialized to living during the day. The moths are basically just everything else. But there are ways of telling butterflies from moths. One of the really easy ways is to look at the antennae, and this works 99.99% of the time, especially in Georgia. In butterflies, they're long and skinny with a knob on the end, whereas in moths, typically it's one of two things. One, it could be hair-like with no knob or big and plumose, feathery. And that's the big difference.</p>

	<p>That's the easy difference. Most people have this misconception that moths are ugly. "Moths are ugly. Butterflies are beautiful! Moths are ugly!" Well that's certainly not the case. There are plenty of moths that are strikingly beautiful. Reds and greens and yellows and just wonderful colors. This one is a cute little tiny tiger moth. And tiger moths are very attractive moths in most cases. There is one of the inch worm moths, about the biggest one we've got in the area that flies this time of year, and it's a big moth, too; about 2 1/2 inches. And it's kind of a bright yellow. I think the reason why moths fascinate me, there are so many more species of moths in the world than there are butterfly species, and there's a lot less known about them as well. And I could turn on these lights out here on my back porch and get something I've never seen before. In this part of Georgia, within a 50 mile radius, you could probably go out and catch maybe 70 or 80, maybe 100 species of butterflies, whereas you could go out and catch 1600, 1700 species of moths. So there's just tremendous diversity in the moths and that's really probably what's got me interested because it's always new. It's always fun. It's always fascinating.</p>
	<p><b>&gt;&gt;Narrator: Whether by day or night, by land, water, or air... insects are valuable members of our complex ecosystem.</b></p>
	<p>&gt;&gt;Heimer: Of course, insects are a really important basis for the food chain. A lot of animals are insect eaters; they're a great source of protein and make up a good portion of a lot of animals' diets. So of course there's a lot of birds that eat them. Many small mammals eat insects, and there's even carnivorous plants that we don't often think about, but things like pitcher plants, and I'm sure everyone's familiar with the Venus Flytraps. They actually do trap and digest the insects, and that's how they get their nutrients the need.</p> <p>One important job that insects do, many of them are decomposers, and that is a big help to natural habitats. When trees die, leaves fall off, animals die even. Insects help to break down those nutrients and deposit them back into the soil</p>

	<p>where plants can use them again.                  Often times we are afraid of insects, and we certainly don't want them around, don't want them in our house, don't want them on our bodies. But insects are very important. They do a lot of good. The earth really couldn't survive without them. They perform services for us like pollination and decomposition. And without them we would be in big trouble.</p>
	<p><b>&gt;&gt;Female Narrator: The North American Butterfly Association's mission is to increase public enjoyment and conservation of butterflies. NABA butterfly counts is an ongoing program of NABA to census the butterflies of North America and to publish the results. Volunteer participants select a count area with a 15-mile diameter and conduct a one-day census of all butterflies sighted within that circle. The counts are usually held around July 4<sup>th</sup> for the US. Write to this address or visit this website if you are interested in participating in a day of butterfly counting.</b></p>
	<p><b>&gt;&gt;Male Narrator: Insects do not begin their lives in their adult form. All begin as eggs, and go through one or two more phases before reaching adulthood...The butterfly egg becomes a caterpillar and then undergoes what is perhaps the most striking transformation in the insect world. Many insects actually begin life in a completely different habitat.</b></p>
	<p>&gt;&gt;Heimer: Many, many insects do get their start in life, um, as water dwellers. A lot insects lay their eggs in or around the water, and then the larvae will develop as something that lives in the water and preys on, perhaps, other insects that live in or around water. Some even prey on minnows. A lot of fish, of course, use these insects that live in the water and some as this insect larvae as a great source of food too, especially a lot of the smaller fish; they will prey on the insects first, and that does kind of form the basis of a water food chain as well.</p>
	<p><b>&gt;&gt;NARRATOR:                  THE ART OF FLY FISHING RELIES HEAVILY ON KNOWING HOW THIS FOOD WEB OPERATES. GEORGIA IS HOME TO SOME OF THE BEST FLY FISHING IN THE SOUTH, BUT BEFORE YOU GET OUT ON THE RIVER, YOU HAVE TO KNOW HOW TO TIE A GOOD FLY. WE JOINED DON PFITZER AND HIS FRIEND JOSHUA BARNETT TO LEARN MORE ABOUT THIS INTRICATE ART FORM.</b></p>

>>Pfitzer: And the whole purpose for this is so that you can see the fly. Fly tying is a fascinating hobby, but why do you tie flies? And the whole purpose is: fly fishing with a fly rod and for trout particularly, you need something that will bring that lure to the water accurately. Well the fly does that. And it's made out of a lot of different materials: hair, string, feathers of all kinds. It's just a wide variety of materials that will make a fly, but the whole purpose is to imitate some sort of insect or some sort of food that the trout is feeding on. We can tie a fly that looks like a minnow; you can tie a fly that looks like a cadis-fly.

The trout sometimes like red on their flies, and some of the earlier fly-tyers found this out and learned to use it that way of course.

The tying of takes several little pieces of equipment, a vice and a bobbin, and to tie the thread, tie the materials on to a hook. And the flies are usually very small compared to bass fishing lures and, and crappy fishing lures. They're very small. The hook sizes are so tiny some times it takes magnification just to tie the pattern that you want.

Josh is one of those young fellas who learn to tie flies right. He does a beautiful job. His hands have been described as being surgeon's hands as he deals with, the threads and the feathers and the things on that attach on the hook of the fly. And he likes to fish! So the whole combination is just a wonderful thing for a youngster like Josh to be involved with, because people who are interested in the out of doors, generally, don't get in trouble.

Fly tying became a fun thing for me; I'm not a fly tier by trade, and anybody who's seen me tie flies, knows that I'm not a great fly tier, but they catch fish, and that's what counts.

**>>Narrator: In order to tie a fly that will catch a fish, you need to know what food the fish are expecting. Experienced fishermen call this “Matching the Hatch” Don and Josh have enlisted the help of Chattahoochee river guide Chris Scalley to learn more.**

>>Scalley: Matching the hatch; that’s what every angler’s dream is to figure out exactly what’s on the menu with trout in the river. And if you can figure this out, if you can solve this puzzle, you’re going to be a more successful angler. When you’re a fly fisherman, you know, you use these different patterns, and all these different factors play into what you’re going to use to match the hatch on the river. The different sampling methods that we used with Josh and Don helped us to kind of narrow it down to, you know, several different food items, several different organisms that are pretty prolific in the river. And then we’ll go ahead and sit down and tie those to imitate the hatch.

I see a lot of myself in Josh; just a young kid that’s got bright eyes and really is hungry for knowledge and he really wants to learn about the river and how to become a better fisherman. And I was the same way

**>>Narrator: Though there are many different types of flies, one of the most popular among Georgia’s trout is the cadis fly.**

>>Scalley: The Chattahoochee is a cadis fly river. It’s an aquatic moth basically; they are related to butterflies. They live for maybe a week or two as adults when they hatch out of the river. During the course of a year, at various stages of the hatch, they are available to the fish, whether it’s a larva or a pupa or an adult. And then when the adults finally come fly back down to lay eggs on the river, that whole scenario is what you, as an angler, should try to mimic.

**>>Narrator: Catching fish is only half the fun. Part of the joy of fly-fishing is the beautiful locations in which you find trout habitat, and Georgia has some of the best.**

>>Pfitzer: North Georgia is a wonderful trout fishing area. There are over a thousand miles of

trout streams in North Georgia that are managed regularly for trout fish. The native brook trout occurs there. They've been introduced--rainbow and brown trout are also there, so it's a good variety of fishing opportunities in the river.

**>>Narrator: Of course, you don't have to venture too far off the beaten path to enjoy an afternoon of fly fishing. Portions of the Chattahoochee river offer great trout fishing.**

>>SCALLEY: The Chattahoochee tail water, between the Buford Dam and Peachtree Creek, is a designated trout stream; it's secondary trout stream, which means that it's a put and take fishery. But also a lot people should realize that there is some natural reproduction in the river, so catch and release is also a good practice for fishing out here. You are required to have a fishing license with the trout stamp. It's an eight fish limit and there's no size limit on the fish. There is a section near town, which is called the delayed harvest stretch, and it's between Sope Creek and Paces Mill. We've got seven ramps throughout a forty-five mile stretch of water with 10,000 acres of parkland. And so we've got this greenway preserved through the river. It's like the Central Park of Atlanta.

>>Barnett: Fly-fishing in an urban area is a lot different than fly-fishing through a smaller town. The river's a lot larger here, and you have to cover a lot more water. And it seems like the fishing's a lot tougher.

**>>Narrator: As Josh Barnett can attest, fly fishing isn't just a sport for adults...people of all ages can get involved, and it's a great way to get kids interested in outdoor activities, and getting started is easy.**

>>Barnett: I'd recommend, if you're a teenager wanting to get into fly-fishing, looking for a good guide to get you out on the water to teach you casting and different things like that, and also to get on the internet and just browse different websites because there's a lot of help you can get from message boards and all on the internet. I've learned a lot since I started trout fishing in that it is very important to conserve our natural resources. When I grow up, I want to be a fly-fishing guide. I never plan to stop fishing.

	<p>&gt;&gt;Narrator: Knowing your insects not only helps you to be a better anger, it offers a fascinating insight into one of the most numerous, diverse, and active animal populations on the planet ...from the delicate to the fearsome, insects inhabit a part of our world we humans get only a glimpse of, a continuous cycle of birth, life, and death that flourishes beneath our very noses, and one which may continue long after we're gone.</p>
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