

Video	Audio
	<p><b>&gt;&gt;NARRATOR:</b> <b>What do the gray bat, the eastern hellbender, the eastern indigo snake, and the pitcher plant have in common? They are all protected species in Georgia. On this episode, we'll explore the lives of these animals and plants and find out what is being done to preserve them for the future.</b></p>
	<p><b>&gt;&gt;NARRATOR: This film clip is from a 1935 expedition to record some of the last ivory-billed woodpeckers ever seen. These animals are just one of the many species lost to habitat destruction, over-hunting, and introduced species. Fortunately programs like Georgia's Natural Heritage Program and the Georgia Endangered Plants Stewardship Network are working to study and preserve the over 100 animal and plant species listed as protected in Georgia.</b></p>
	<p>&gt;&gt;Ambrose: The Georgia Natural Heritage Program is a program within the non-game and natural heritage section in the wildlife resources division of Georgia DNR. And we are involved in a lot of different activities having to do with wildlife conservation. One of the things we do is maintain a database on rare plants and rare animals and significant natural communities found in Georgia. We work with private landowners and with other public agencies to try to protect those species and natural communities.</p>
	<p><b>&gt;&gt;NARRATOR: ONE OF THESE PARTNERSHIPS IS WITH THE U.S. FISH &amp; WILDLIFE SERVICE AND FORT STEWART. FORT STEWART, LOCATED IN SOUTHEAST GEORGIA, IS HOME TO THE THIRD INFANTRY DIVISION OF THE UNITED STATES ARMY. IT IS ALSO HOME TO THE THREATENED EASTERN INDIGO SNAKE AND SIX OTHER PROTECTED SPECIES.</b></p>

	<p>&gt;&gt;Stevenson: Well, indigo snakes are the longest type of snake in the United States. Males commonly get seven to seven and a half feet in length; they are enormous. This is a shiny, bluish-black snake, very beautiful. Sometimes they have a little bit of orange-red pigment on their chin. The similar black racer is the most abundant snake in South Georgia. Indigo snakes are much slower moving, deliberate; they move deliberately.</p>
	<p><b>&gt;&gt;NARRATOR: EASTERN INDIGO SNAKES ARE SHY ANIMALS AND SPEND A LOT OF THEIR TIME UNDERGROUND, SO TO STUDY THEM EFFECTIVELY, RADIO TELEMTRY IS BEING USED.</b></p>
	<p>&gt;&gt;Hyslop: Radio telemetry on a snake species, we actually take the radio transmitter, which is a small package that is hermetically sealed with an antennae coming of it. And we implant that inside of the body cavity of the snake. Each of these transmitters has a unique radio signal that's picked up by a radio receiver. You dial in whatever snake you want to track at the moment and you put the antenna on and you listen for beeps. And you actually just follow the strongest beep or the strongest signal from the radio transmitter and that will take you to the snake's location.</p> <p>Ok, this is snake number 8, and I have a faint signal for it in that direction, so it's probably almost half a mile away in that direction.</p> <p>It can take anywhere between half an hour to two hours to track each snake depending on how far they've moved. How far you can get the signal depends on part of the and even weather conditions some day. And it also depends on how far into the habitat they are, how far away from a road.</p> <p>There are 20 indigo snakes in this study. The goal is to get 2 to 3 radiolocations per snake per week.</p> <p>The snake is out. If it's active and I see the snake, I back off of it. I stop my approach and I back off and allow the snake to go about its business and try to disturb it as little as possible. The data that we do take are the snake, the date, time; note the location; we take GPS coordinates as well. And we also take the snake's temperatures. These transmitters are temperature sensitive.</p> <p>Before we started this study, home range estimates for the eastern indigo snake were upwards of 800 acres. What we found in this study is home range is upwards of 3000 acres, so much larger than previously thought. What that means is the snake requires large, large tracts of land, and therefore this habitat fragmentation and degradation is even more important because these snakes are traversing such large areas, that they're coming in higher and higher contact with unsuitable habitats and with humans. And often these encounters with humans are not positive.</p>
	<p>&gt;&gt;Ambrose: Under the state law, there are four categories that are used for protection of species. "Endangered" is used for species that are in danger of extinction throughout their range</p>

	<p>or throughout a significant portion of their range. “Threatened” is used for species that are not currently endangered but are thought to moving towards that. In other words, the feeling is that they will be endangered in the foreseeable future. “Rare” is used for those species that are scarce in this state that are not currently endangered or threatened but there is a need to emphasize those in terms of wildlife conservation. And “unusual” is used for those species primarily that have potential of being impacted because they are used in the pet trade.</p>
	<p><b>&gt;&gt;Narrator: The pet trade is one reason for the threatened status of indigo snake, but habitat destruction and invasive exotic species are a killer of many more animals. Fifty percent of North America’s freshwater mussels are facing the danger of extinction, mostly because of habitat degradation.</b></p>
	<p>&gt;&gt;Golladay: Throughout north America, freshwater mussels are experiencing declines, and that’s also true in Georgia. Many mussel species are rare and declining both in where they occur and in the numbers that they occur. There are a number of reasons, in the past there has been over harvesting of mussels, which has led to declines. Certainly pollution of waterways has led to declines in mussel because, as a group, many are intolerant of pollution. We’ve altered our river corridors through channel dredging for navigation and other activities that have decreased the availability of habitat. The development of reservoirs has led to mussel population declines because many species don’t live in still water. Other populations become isolated and aren’t able to disperse because of the reservoir, so there have been many things that have contributed. Introduced species like the asian clam have displaced native mussels so all of those factors have contributed to the declines of freshwater mussels</p>
	<p><b>&gt;&gt;Narrator: Freshwater mollusks help clean the streams they live in. Because clean water is a vital human need, losing our natural water cleaners can directly affect human health.</b></p>
	<p>&gt;&gt;Golladay: Freshwater mussels have played an important role in streams and rivers. Because of their ability to filter water and purify water, they can contribute to the health of streams and rivers. And I think finally there’s an aesthetic question: we don’t know exactly all of the benefits that freshwater mussels might confer to humans, but I think it’s a shame to discard them until we better understand their role in streams and rivers.</p>

	<p>&gt;&gt;Ambrose: Freshwater mussels present some real challenges in terms of endangered species conservation. They require host fish to complete their lifestyle. There's actually a stage of the mussel that lives on a fish for a while.</p>
	<p><b>&gt;&gt;Narrator: In order to better understand the "big picture," the Natural Heritage Program is implementing a Comprehensive Wildlife Strategy.</b></p>
	<p>&gt;&gt; Ambrose: One of the things that we've learned is that we need to look at what's going on in the landscape and the watershed to really be able to protect these species. In many cases, it's not one impact; it's cumulative impacts that are occurring in that watershed. So we really need to think in terms of protecting healthy ecosystems. The Federal Endangered Species Act emphasizes the need to conserve ecosystems, not just populations of species. Wwe also need to be proactive in our approach; we need to focus on these species of conservation concern before they get critically imperiled. We need to work on them while there is still time. We'll be much ore efficient and effective if we do that.</p>
	<p><b>&gt;&gt;Narrator: One rare species under watch is the eastern hellbender, a species almost completely dependent on clean, fresh water. Unlike most salamanders, hellbenders grow to 2-and-a-half feet in length and spend their entire lives in the heavily oxygenated water normally found in cool mountain streams. Hellbenders thrive in clean streams with rocky bottoms and fast-flowing rapids.</b></p>
	<p>&gt;&gt;Jensen: They are found in the Eastern and Central part of the country. And they belong to a family that is only represented by two other species besides the hellbender, and that's the Japanese Giant Salamander and the Chinese Giant Salamander, which get to four or five feet long. They are enormous salamanders. So the closest relative to this hellbender is in Asia. And it's a pretty interesting animal. It's fully aquatic. Most of our salamander species are either terrestrial, live on land only, or they live on land for most of their life cycle, but must go to water to breed. These guys live exclusively in the water, never come out.</p>

	<p><b>&gt;&gt;Narrator: One way to test the health of the hellbender population is to locate them in their element, moving water. But, John's and Ken's search begins with a disappointment.</b></p> <p>&gt;&gt;Jensen: Well, we found a dead. It had a huge gash in its head. It looked like someone had either smashed it or gored it or something, but definitely not a predation event. That's something we are really concerned about. For some reason people fear these things. There's no reason to fear them, they are completely harmless to people. They don't eat trout; they eat crayfish, and illegal to kill them.</p> <p><b>&gt;&gt;Narrator: John does find a juvenile hellbender, hope that the population is surviving, even if the adults are hard to find. But because our aquatic habitats are some of the most imperiled, there are currently 55 fish species on Georgia's Protected List.</b></p>
	<p><b>Some of these fish include the robust redhorse, long thought to be extinct, and the short-nosed sturgeon, imperiled because of their need for undammed streams and rivers. And in the Etowah river system...</b></p> <p>&gt;&gt;Freeman: There are 3 species of fishes in the Etowah system that are federally listed right now. These are the amber darter, the Etowah darter and the Cherokee darter. The amber darter is a federally endangered fish that was formally listed in the 80s. it was not discovered until the late 1960s, and then described somewhat after that. The 2 main populations, the only 2 populations of the amber darter are the Conasauga River, above the Dalton area and the Etowah River above the Canton area. And I say "above" these cities because what happens in the lower reaches of these systems, they've been severely altered. In the case of the Etowah River, it's been altered by mining, development, Allatoona Reservoir. In the case of Dalton, it's been modified by industrial pollution over the years. And of course we're cleaning this up now, but still the river is quite altered.</p> <p>Darters are small perches that have had the scientific genus,</p>

	<p>Percina, means “little perch.” The amber darter is only about 60 centimeters total length. That’s the large one. The amber darter requires clean, loose gravel bed sediments, or material that’s on the bottom of the river. So if the stream is experiencing a lot of sedimentation, excess sedimentation, such that these gravel areas are smothered with sediments. So we normally collect these animals by kick seining. Kick seining consists of two individuals holding the seine, and two or three other individuals kicking and disturbing the bed sediments of the river to drive and scare fishes into the seine, and then yank it up real fast and see what you have. And some days it’s too high to adequately sample, and other days it’s just perfect. Today this was a little high to be effectively collecting fish using kick seining methods.</p>
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	<p><b>&gt;&gt;Narrator: Because of the river's height, the amber darters were elusive. Our group did find another imperiled species, though.</b></p>
	<p>&gt;&gt;Freeman: This is a medium-sized frecklebelly madtom that I've got in my hand. This is a small species of catfish. They're really cute. They've got some interesting features though. These spines, the pectoral spine here and the dorsal spine, they have a poison gland at the base of the spine. If you accidentally squeezed this or pricked yourself with the spine, you'll get a little bit of poison injected that feels like a bee sting. So be very careful with how you pick them up. In the state of Georgia, this species only occurs functionally in the Etowah River above Canton and below the Blue Ridge. So this is a species that's protected in Georgia, but it's not federally listed yet. And if you catch one of these in Georgia, please don't use it as fish bait. These madtoms are scarce.</p>
	<p><b>&gt;&gt;Narrator: Some of Georgia's aquatic mammal species have become scarce as well. The migratory Northern Right Whale calves only in Georgia's waters and is listed as endangered because of early overhunting and ongoing ship strikes. The endangered humpback whale is also associated with our coastline, and the gentle manatee, which must stay in warm waters, is a seasonal resident of Georgia. These gentle giants may live as long as 50 years, but are slow swimmers and are often killed by speedboats. Other endangered mammals include The Florida Panther and the Mountain Lion, which are subspecies of the same animal. And some of our smallest endangered mammals have wings. That's right, Georgia has three bat species which are rare or endangered: Rafinesque's Big Eared Bat, the Indiana Myotis, and the Gray Myotis.</b></p>
	<p>&gt;&gt;Putnam: The Southeastern Cave Conservancy was incorporated in Georgia in 1991, and it owns now more than</p>

	<p>50 caves on more than 20 preserves in the southeast. The entrance of Frick's Cave is one of the largest cave entrances in Georgia. It has a large opening and then a small constriction where some rocks have collapsed many, many years ago, and once you go through that large opening in the constriction, it opens into a spacious stream passage. It's about 6 to 8 feet high and about 30 feet wide. That passage runs for about 800 feet to a junction. Beyond that junction is the room where the bats live in the summertime. It's up high above the stream and serves as a warm air trap. They like it a little warmer than the typical 57-degree cave temperature. And their body heat is trapped in that room and brings temperature up to the region that they like it to be in. In the wintertime, the bats from Frick's Cave are believed to go over Lookout Mountain and across the Tennessee River to the Paint Rock Valley near Scottsboro, Alabama. There's a large cave system there, the Fern Cave system that's a wildlife refuge owned by the US Fish and Wildlife Service, and those bats from Frick's Cave are joined by bats from other caves all over Northeast Alabama and North Georgia. And the group that hibernates in Fern Cave is more than 500,000 bats. This is an interesting cave. It's a very dynamic cave. The bats act as a transport mechanism to bring nutrients and food into the cave, and that supports a whole colony of different types of animals. Farther back in the cave where the bats roost, there are large piles of the guano, and those support centipedes and millipedes. We're standing just barely inside the entrance, and that's as far as we can go because the bats are about 1000 to 1200 feet back in the cave. We don't want to get anywhere near them.</p>
	<p><b>&gt;&gt;Narrator: Unlike this pipestrel bat, which also lives in Frick's Cave, gray bats will become easily frightened if disturbed and waste necessary energy trying to escape. This makes them a conservation challenge. To learn about their population, biologists observe them as they leave the cave at dusk to forage.</b></p>
	<p>&gt;&gt;Putnam: Everyday at twilight if it's not raining, the bats come out of the cave, and in this cave, they'll come through the main passage, which is quite spacious and into the large alcove of the entrance where they'll start to mill around and circle and then they make their way out in groups from that alcove into the tree cover. And they use the tree canopy for cover against the owls and other predators.</p> <p><b>&gt;&gt;Narrator: A species may be a conservation challenge for many reasons.</b></p>

**Birds, like the swallowtailed kite, which migrate thousands of miles are Georgia residents for only part of the year, increasing the lengths to which biologists must go to study them.**

>>Ambrose: The swallowtail kite is an example of a species that we've tried to work on proactively. We've tried to implement some conservation before it gets to the critically imperiled stage.

>>Williams: Kites are found in Georgia from about March until the end of August, maybe early September. And the main thing they're using our habitats for is, in the early part of the season, they're here for nesting. And then later in the season, after the young birds have fledged, which is usually about the middle part of June, then they—of course first they hang out with their parents, and then they learn how to be a kite, and they learn how to feed and they learn how to forage, and what we see towards the end of the fledging period, and when they're really just getting ready to migrate, they tend to congregate over fields and marshes just exhibiting some of the most amazing aerial acrobatics, just soaring above the fields and then just nose-diving and skimming across the edge of the vegetation and plucking these little unsuspecting green June beetles up.

Prior to 1999 we had no documented nests for swallowtail kites in the state of Georgia, which is amazing considering the fact that it's a large bird; they have about a 35-inch wingspan, and it's a very obvious bird, big, black and white, big forked tail. And we've never had a serious effort to really learn about kites in the state. And we originally got interested in kites—now there are a whole host of species in Georgia, primarily non-game species that we just don't know a lot about, and trying to tackle that over 900 species and figure out, you know, what do we need to be working on? What do we need to be doing surveys for is very challenging. And I work with an effort called Partners In Flight, which is an international bird conservation movement, and one of the first things that Partners In Flight did was to take a look at that priority system from a bird perspective. And when you do that, swallowtail kites very quickly become obvious as something that needs attention. Swallowtail kites have a very small population. The number of nesting pairs is somewhere probably around fifteen or sixteen hundred birds in the entire southeast, and if you add in the birds that don't breed, the young of the year and the birds that aren't breeding until they're 3 or 4 years old, the whole population is only about 3500 birds, and when you add to that the fact that they used to have a much larger range. They used to nest in 22 states, all the way up the Mississippi

	<p>Valley, all across the south, and now they're only found in the heart of the south, mainly associated with the major river drainages in those states.</p>
	<p><b>&gt;&gt;Narrator: For all the challenges presented by the conservation of imperiled species, there are some remarkable success stories.</b></p>
	<p>&gt;&gt;Ambrose: A good example of a success story I think would be the bald eagle. Clearly endangered extinction at one point. It has come back dramatically in part due to the elimination of persistent pesticides that were causing problems with reproduction. The same is true for the peregrine falcon. There are some species that have come back from very low numbers: the American alligator and the American bison, primarily due to regulation of hunting. They were being over-harvested. The robust redhorse, which is a federal candidate species, didn't get to the point where it was critically imperiled, but through a proactive approach to really look at its conservation needs and try to address those, it's been brought back to a large extent that it's seen some pretty significant increases in population.</p> <p><b>&gt;&gt;Narrator: We have looked at only a few of the challenges ahead, but beginning to understand the connection between humans, other species, and the environments we all depend on can help us make the choices necessary to keep earth's habitats sustainable for all of us.</b></p>
	<p><b>&gt;&gt;Female Narrator: There are currently no state funds available for non-game wildlife conservation, so programs like swallowtail kite surveys and protection of sea turtle nests are funded by federal grants, direct donations and fundraising initiatives like the non-game wildlife license plate. So if you want to help Georgia's protected species, buy a new non-game wildlife license plate and sign up for Georgia Wild, the free official newsletter on Georgia's wildlife license plates.</b></p>
	<p><b>&gt;&gt;Narrator: Students at schools across Georgia are learning about and growing Georgia endangered plant species, thanks</b></p>

**to an exciting education initiative of the Georgia Plant Conservation Alliance. These kids and their school have their very own bog garden.**

>>Ceska: The bog project is part of the Georgia Endangered Plant Stewardship Network, and this is a network of schools and museums throughout the state of Georgia that work together to grow and teach about endangered plants. And the program—there are several things for students and teachers. The kids are able to hold an endangered plant and care for an endangered species, and that creates a conservation ethic in them, that they care about the environment and they have something that they can actually do to help something endangered.

>>McKinnon: I think the bog is really cool because it took us all spring to make it and you have to get special permission to do it. And my favorite bog is the xyris because it looks like a little pine cone.

>>Calvert: I like the bog garden because it shows that we care about plants, and my favorite plant is the seed box because it looks like a box, and when you open it up, more seeds come out and you can plant them anywhere.

>>Ceska: We did a science inquiry activity. And a science inquiry is where a teacher or an environmental educator will lead the kids through an activity and ask them questions and let them discover what's going on with the subject. So we were doing some seed collecting. And then we did some pitcher plant autopsies to see what kind of critters the pitcher plants were eating.

>>Children: Whoah!

>>Ceska: Look at all that stuff! What do you see? Do you see parts?

>>Children: Yeah!

>>Child: There's a fly.

>>Ceska: Do y'all know about exoskeletons?

...And it's lots of fun because there's all kinds of goo and parts of bugs inside and get really interested in what they're doing. It also improves their science process skills. During the science inquiry, the kids were comfortable to ask me questions and they would make observations, and have the confidence to say those observations out loud.

>>Peterson: I learned that the pitcher plants are endangered

	<p>because people have been digging them up and building parking lots and stuff over them. It made me want to help save them.</p> <p>&gt;&gt;Whittemore: My favorite plant is the purple pitcher plant because you can watch the bugs go into it and it looks really neat.</p> <p>&gt;&gt;Cindea: And I learned that you have to burn the bog garden in the winter so the weeds can't take over the bog garden.</p> <p>&gt;&gt;Mahar: I've always been an avid gardener and have gotten two outdoor classroom grants to do butterfly gardens, and when I heard about the workshop up at Piedmont College on endangered plants, that just sounded right up my alley. So I went and took the course and came back and presented the information to my kids and they just loved it.</p> <p>&gt;&gt;Turner: The best thing that I like about the bog is that the pitcher plants always digest different bugs and you get to look at them, and I think that's really neat.</p>
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