Tracey Peake ([00:00](https://www.rev.com/transcript-editor/shared/vTqxJGzLL9ZuIrMQkOccYvh8LhWJxtCJzNUxFD3xclGeUGnkZ7iF5_p6klzBRc_Y5rg5wUsn6zJoqeGSBo3Up--jTaI?loadFrom=DocumentDeeplink&ts=0.63)):

Hello, and welcome to NC State's Audio Abstract. I'm your host, Tracey Peake. Lampreys. They're weird looking water dwellers that have been around since dinosaurs roamed the Earth. By weird looking, I mean that they've even been described by our next guest as, "Tubes with a freaky circle of teeth." That's definitely enough to get me interested.

([00:21](https://www.rev.com/transcript-editor/shared/16bPqF_F_KReJqi9081e50_04gPotdTRjE_sfF0Q-HWOvA0xCTNYYh5mVFoUTvTwbzP65_YlS9UPweRYn8WlUeK0BFc?loadFrom=DocumentDeeplink&ts=21.48)):

Today, we're talking lampreys with Lily Hughes, a research assistant professor at North Carolina State University, and the curator of ichthyology at the North Carolina Museum of Natural Sciences.

([00:32](https://www.rev.com/transcript-editor/shared/oJg73QeDCw55BSGU_t5_uPw-GOeX7mt9cnX7rb_2Y1hyFQGlPz2iM56T3UD_ZW53b35PhyHecUVYAc670cSc70_k4N8?loadFrom=DocumentDeeplink&ts=32.97)):

Welcome, Lily.

Lily Hughes ([00:34](https://www.rev.com/transcript-editor/shared/kIuLWssKaFyuMmKIQSdYHxjOXPeLjzan2NonW-kMgDuMoJ5qvuk80QXchEETnCExYj8VHwjEhw0PLm71PV0tClJ8JyU?loadFrom=DocumentDeeplink&ts=34.08)):

Hi. Thanks for the invite.

Tracey Peake ([00:35](https://www.rev.com/transcript-editor/shared/E-7eTU30D7YOEwaHRnGZuMSfXBcJoeIX6I2jhRyd7cIlM-_SbgV0ComEDLGdQHYOf9oopLq42ihjAy776W8OZwMjfIE?loadFrom=DocumentDeeplink&ts=35.34)):

I'm so excited about lampreys, because they are so weird looking.

Lily Hughes ([00:39](https://www.rev.com/transcript-editor/shared/gQhtfQ1QCXpzcRZRM-bumvCsTFoRojcGbX1lPjSKEnz5a0IoJuFsGZC6D2QFB_2YOTq_ipnNlvS06cHYPCO57jka9Vw?loadFrom=DocumentDeeplink&ts=39.57)):

It's true.

Tracey Peake ([00:42](https://www.rev.com/transcript-editor/shared/J-kxEpSr2aMj9lgPtUf1dk2AAGOTYZPSxXZvFItzseu5tBnDIwfWObEgYaK9XqLosg8RVO4jac5gvuZuGUjchTWFejM?loadFrom=DocumentDeeplink&ts=42.09)):

What do we know about lamprey evolution? They've been around since dinosaurs roamed. How long do we think they've been around?

Lily Hughes ([00:50](https://www.rev.com/transcript-editor/shared/Poto8lnbSjY_vm7U6MNNrjuFWfePRIKElYpH_zOK3vDxkPO7RtpYH795CAzjwoC_k1LexZZoWZDauGHpYf13RA7Q6Go?loadFrom=DocumentDeeplink&ts=50.16)):

They've actually been around quite a bit longer than dinosaurs.

Tracey Peake ([00:54](https://www.rev.com/transcript-editor/shared/r1COhA-2MErEhM1_vttqq1prPXlWeEkjNEX6k49RvSteSTSq18pscm5bNLLK8Yuj2VFaZu8L0LQX5fM2cgrzmaff51U?loadFrom=DocumentDeeplink&ts=54.81)):

Wow.

Lily Hughes ([00:56](https://www.rev.com/transcript-editor/shared/uFtzzcOmYLu6_DJD_xRs61Be0qWeaC92StgYNR5O2WuczWSP7Q79582Asv6uDz8jDBYgKrdN3kMK1xk_yEbhX6IBz-0?loadFrom=DocumentDeeplink&ts=56.37)):

We don't know, we can't pinpoint the exact time that this lineage we call lampreys emerged. But they probably started evolving sometime after what we call the Cambrian explosion. The Cambrian was a time between 538, 485 million years ago, so quite a long time ago. Where a lot of ancestors of the animal phyla that we can recognize today started emerging, so this explosion of multicellular life.

([01:29](https://www.rev.com/transcript-editor/shared/ZXnepxgvAaI7KRRvt3VUdN_VLct-GL8D2I-tr8eAsaLjttJ6-GXKnfMvDuPjCJhC4e9t6A6mLxiAqIWK9ITeQs1zKao?loadFrom=DocumentDeeplink&ts=89.73)):

We don't know when the first thing we'd recognize as a lamprey occurred, but we do know that the oldest lamprey fossil was found in the Devonian, which is a time called the Age of Fishes actually.

Tracey Peake ([01:43](https://www.rev.com/transcript-editor/shared/oba6mmFZvRSPptvQFnYGyZFjAbAVavLA6cwQxBnLH0A4SRgRLW9wpC7WfEZHvM2a2cWiR7c4R4DDrPzdqVKJmWJw0e0?loadFrom=DocumentDeeplink&ts=103.11)):

Which is right up your alley.

Lily Hughes ([01:44](https://www.rev.com/transcript-editor/shared/ZCI76uiudWd9MLgqRdUmNomGfk_O_uObw0rYnNfkdodYdA6neeM_nSk8IhtV7h28lS6A9urJhOlC03T_7dUkXfgIoSc?loadFrom=DocumentDeeplink&ts=104.19)):

Right up my alley. Age of Fishes, it sounds like a great time. That was around 360 million years ago. It really does look like a lamprey. It's got this big circular oral disc that we'd recognize. But they probably evolved sometime before that. So between the Cambrian explosion and sometime in the Age of Fishes, this lineage we know as lampreys emerged.

Tracey Peake ([02:48](https://www.rev.com/transcript-editor/shared/kqpya4bkhnZ9Es5VRWo7BtIfH0UCrD55Q_G6FUVf19m4wy1YmjdHDHay3lByp3__7R9StRa02dCpFoV6ZIVFEEv81oQ?loadFrom=DocumentDeeplink&ts=168.69)):

They've been around ... When you get back into the Devonian, and stuff like that, for the rest of us here in the world, it's just a really long time.

Lily Hughes ([02:54](https://www.rev.com/transcript-editor/shared/OsqUwwTgLYBr_nlcHRtEbFb-ejpUp1fNER0n_0g2ugM3QjeeOCIhWnVWDfZaEaXyQnCAPuy5aD1VBY1SpX5oReYZMMQ?loadFrom=DocumentDeeplink&ts=174.81)):

Really ancient.

Tracey Peake ([02:56](https://www.rev.com/transcript-editor/shared/XWisQLr_T9YVVz3-2wpsfLAv79_id4ZL2RdJWRFIkwe-qRK3KUuJIJOYECiAdG1fITYc4TewrMsSbgP7D0NoEeTOuwQ?loadFrom=DocumentDeeplink&ts=176.31)):

Yes.

Lily Hughes ([02:56](https://www.rev.com/transcript-editor/shared/8EqlsHnB9hS6qL8LkHPVeNEvV8tYmThEejsxLoUW_4A12SWQkJjU7NksBHEw31cOet8sX7X-EDP51-kYciJBKzDXbqs?loadFrom=DocumentDeeplink&ts=176.46)):

Yeah, very ancient.

Tracey Peake ([02:57](https://www.rev.com/transcript-editor/shared/5BsjYd1agx2ucNKyjKEXQmNPsEIEB67GEbxuxdRYMJTIijv_4bPYBKfAKWTiYPTc292qSdzB1AKYyLDaQcKlYa0tw8s?loadFrom=DocumentDeeplink&ts=177.09)):

Super ancient.

Lily Hughes ([02:57](https://www.rev.com/transcript-editor/shared/cu8zOZkLepgFTX4qX3vNFUbuwIkrd_bBoQGQO-f0661AELj3baT_AFPH_7zQBTjPyrUGjAXnYpAczVoqgF1tQeKkbDk?loadFrom=DocumentDeeplink&ts=177.87)):

Yeah.

Tracey Peake ([03:00](https://www.rev.com/transcript-editor/shared/WjouU7I2wb8zYgwUy8v_ekHkY6p_RcrgiEza08yY770z8vG3PUMFg-eCc-bAJB3OU8Iiy8CoU1_p2-gXETHZJICr4LA?loadFrom=DocumentDeeplink&ts=180.21)):

When did sharks evolve? Because sharks are the other thing that we think of as being a really ancient creature.

Lily Hughes ([03:06](https://www.rev.com/transcript-editor/shared/E_q7oyh3JHJYaklzJUOH7kM6VJLd59BZW-10J5sgh5Et9PE3BEV0l_tKZI50eopAcE_uoB5Kvrf5Q1aGvJuX2oyhqCI?loadFrom=DocumentDeeplink&ts=186.33)):

Sure. Sharks ... To back up a little bit, sharks and lampreys, they've got teeth and we are scared. But they have this distinction where lampreys are what we call jawless fish. Sharks have jaws.

Tracey Peake ([03:25](https://www.rev.com/transcript-editor/shared/i9TpvKRGjxg_3dRV7FdWxv4EkL5VLBFye-TATv6Avb5DQG2uMY_u__5ysBdI_P623j83dd7cyrPM0E-iAzwS-9xikK8?loadFrom=DocumentDeeplink&ts=205.53)):

Right.

Lily Hughes ([03:25](https://www.rev.com/transcript-editor/shared/w51cypQnqHu7qBLNQRG3JoQ32SxgZEtVBSSx6bYn50DiCtcGd1281fk4-xekPWSyih1unBfNt1PE1YXLaxhsWAJK2RU?loadFrom=DocumentDeeplink&ts=205.83)):

We can recognize that they have jaws. We have jaws. We are jawed vertebrates. Or gnathostomes is the scientific name. Lampreys are what we call cyclostomes, and they do not have a jaw as we would recognize it.

([03:57](https://www.rev.com/transcript-editor/shared/mSLdcOyffWH8BZTJl9YPCBNVljpCxLb2YQfTqJqEnwxkd5jtgv30iZxvb5IBqANZpqygT265yGA4-StaWWLG5gIGYXc?loadFrom=DocumentDeeplink&ts=237.03)):

Jawed vertebrates all share a common ancestor. They likely evolved in the Devonian as well. The jawless vertebrates, there's only two lineages living today. We have lampreys and hag fishes that are from this really ancient time before the evolution of jaws. In the Devonian, way back when, there were lots of kinds of jawless vertebrates, but they all went extinct. The only ones living today are hag fish and lampreys.

Tracey Peake ([04:53](https://www.rev.com/transcript-editor/shared/YUGgX9M1vAsF6lDnCeorh3sw2D4ZSjxMx-VSvAyZj7Ck7rlEaBASthNb-ENLFcsiaQt6np6kR6jxtJElmMI65xl7g0M?loadFrom=DocumentDeeplink&ts=293.28)):

Which begs the question, how do you eat if you don't have a jaw?

Lily Hughes ([04:58](https://www.rev.com/transcript-editor/shared/9IuBaW6PgZJfqqn4K78wQe3xKyBxujJ_yWVVjO-3JVLx3NovbCXD7hVPICMBpLFsdMfYt95McvTa7D08p9lbDXkhGB0?loadFrom=DocumentDeeplink&ts=298.56)):

They still have a mouth.

Tracey Peake ([04:59](https://www.rev.com/transcript-editor/shared/wMDVAkr1_Dh-_evnWTDmkTep-653MKOGMjAAeX9YEzMngcrEfCn_n2LclXlSKDHjGNYrNkQaIlcduvbe0htqVxHfW3k?loadFrom=DocumentDeeplink&ts=299.46)):

Right.

Lily Hughes ([04:59](https://www.rev.com/transcript-editor/shared/X3OSoAUNfpToTMvMyN4Eq8kUMVNMBI7Gbs4BkVcgiqqgBDokySnEiyul6h3Em_YFkLcthX09uGLamyy1it67m5WEmHA?loadFrom=DocumentDeeplink&ts=299.73)):

They still can eat and suction, but it's a different way of eating, for sure.

Tracey Peake ([05:07](https://www.rev.com/transcript-editor/shared/7YTNUaoZ3yWblTnwVpaHWTKkGOqYMajTBkjwCErcKtf3XQK6TGVn4rJzrP6iMvApqlE0rM_xf4bmtlAEllRpOzb7Nsk?loadFrom=DocumentDeeplink&ts=307.35)):

Yeah. That's so bizarre.

Lily Hughes ([05:09](https://www.rev.com/transcript-editor/shared/I4wroH6E0-7L5lvfF2NtSnxzmhczHjiXMk2dOyN6IP3igh0glzkn7Mr6cH17i-GRM6YctH7E3ppQlNsZxz-LCEhcGxM?loadFrom=DocumentDeeplink&ts=309.75)):

I don't know exactly. They certainly can suction with that oral disc.

Tracey Peake ([05:15](https://www.rev.com/transcript-editor/shared/rD4ThDl_oV4eTISeq5lTh_UGX4U0iPsynE6QKJEF4RHcb9OOSSYPDEd3gtLOX3tsxotRPhRun8_lWRf4fj2L3AwZfrY?loadFrom=DocumentDeeplink&ts=315.96)):

Okay. Yeah. Why do they look like they look?

Lily Hughes ([05:21](https://www.rev.com/transcript-editor/shared/boLVW59KVnAZLNrmoJ0KcnRKaTU5nqJNLemAzzprnbR4n7pvtT9uIw8gapw0ih36EeDAfsleKi3N6_QtP8GcDPwTeLU?loadFrom=DocumentDeeplink&ts=321.42)):

We don't know exactly when this lifecycle evolved, but many species are parasites. They use that big disc of teeth to latch onto other marine animals, like other fish. Maybe marine porpoises, whales, other marine vertebrates. They suck their blood.

Tracey Peake ([05:55](https://www.rev.com/transcript-editor/shared/qyM18D-gWPtlAFvAIV0vsEOLt7g7-xqRtLucve-e3parPuaMd6lBjqdSjNC4NWs6De0xyXBuC_QqRWS9E0Blc09i-h4?loadFrom=DocumentDeeplink&ts=355.38)):

Okay. They're basically living on blood. Because then you look at the teeth you think, "This is something that is built for tearing stuff to shreds."

Lily Hughes ([06:05](https://www.rev.com/transcript-editor/shared/hvCt_kppc53HxfLB0quAyGXKJGdUqvaeX_mfQQWc_4vUD_YQYW1pJh17PfmCCSAuMpuACaHvaabAn-AnQihLWiMPWZY?loadFrom=DocumentDeeplink&ts=365.19)):

They'll actually attach to other organisms with that disc and suction onto them.

Tracey Peake

Lampreys are ancient.

Lily Hughes ([21:21](https://www.rev.com/transcript-editor/shared/ehDFFIl3AzXWA6EiVns5A6cjSf5uA0phaG-756OkAUYcXokFMGidbp95EDRcUL1I8CGYk-8K_wCo2z6cxx1pzTLxDIM?loadFrom=DocumentDeeplink&ts=1281.03)):

Yes.

Tracey Peake ([21:22](https://www.rev.com/transcript-editor/shared/8nsgdgEYmKlt97CeH8IXSvgC_DbFKfZtq5qDvjVM-CwBBTkk69wOyZprWTWw5zhHuTpukkahWoXovQJciUneE-0qKjk?loadFrom=DocumentDeeplink&ts=1282.41)):

Are they relatively unchanged from the fossil record? Did they hit on what they wanted to be, and that's what they were? That's why I was also drawing the shark comparison.

Lily Hughes ([21:34](https://www.rev.com/transcript-editor/shared/0UT9s3qnnLVa3EU041YSirN5M7gZ6jXnU28LHnTDFIOaI3x14ddg-IMpKw0PEa1fIM0k36nhVxPsojoEv8wPDsv9VPs?loadFrom=DocumentDeeplink&ts=1294.68)):

Right.

Tracey Peake ([21:34](https://www.rev.com/transcript-editor/shared/Y9yRdpTQm-o4Dev2GDQfJkyNAWnkJ4cnjpGSsiKddEmTspWObercg3HFMe1pDTB9cjxXl1MzVJBD6hA-cskSmVTBI1A?loadFrom=DocumentDeeplink&ts=1294.77)):

Like, "Hey, this works."

Lily Hughes ([21:36](https://www.rev.com/transcript-editor/shared/ZOXNepgDbuRxDznH5BLo9zyZ7lKmCJYfohtch1YYzbQKIPOsuFu95jndKs9rfR7L4c8cXFVH3xO3iSQ2m1DcNOuv45Q?loadFrom=DocumentDeeplink&ts=1296.18)):

That's a great question.

Tracey Peake ([21:36](https://www.rev.com/transcript-editor/shared/Dj5jOHWG-1M6W-TxNXLPrbzP223k8jHGsWDygcXLMWzproqiWOBiZJu37YZvGyvexxabyzeAipfYHbOZM14Ts3QEHzE?loadFrom=DocumentDeeplink&ts=1296.18)):

"We'll be this."

Lily Hughes ([21:39](https://www.rev.com/transcript-editor/shared/2lfc4j_5Y2NDfJGRtAT80imXudAGkK3Bs9Pf_L7P_nBJ82OXLIIKSJ8jC3nom2uTwaMGi7mXl8BdFqf5Y9PQbM4LUYU?loadFrom=DocumentDeeplink&ts=1299)):

That's a great question. Lampreys are pretty scarce in the fossil record.

Tracey Peake ([21:43](https://www.rev.com/transcript-editor/shared/IHHwwdmnXxLPFXN9ku22HjnJ5RsELcF8WJZet9bLiM73BIRXs2mZf9Ny-uENtkt_G8SCwHTSzsCUoO0dzW8VgyCR4-E?loadFrom=DocumentDeeplink&ts=1303.74)):

Right.

Lily Hughes ([21:44](https://www.rev.com/transcript-editor/shared/PhIoRnvDTG8ouA57Zh8hbURWZLy2Y2vpGSUzJeqbOrbakYAsY1ND34qEKrhNiuQwXsHqMA7f2XDbzZhZW28Td2oogPU?loadFrom=DocumentDeeplink&ts=1304.25)):

We don't have a lot of really good lamprey fossils. We know they've been around for a long time. There's about maybe eight or nine off the top of my head, I'm not sure, but around that number of really good definitive lamprey fossils. They certainly look recognizably like lampreys. That oral disc is something we certainly have seen today. Now, it's possible there are things that didn't really look like that that were related and we're not recognizing them as lampreys. But certainly, that body plan was around as far back as the Devonian.

I would say, even with sharks or things that we think about as relatively unchanged, there can be changes that we're not aware of. Or changes that maybe you need a really specific fossil record to see. The fossil record maybe captures some elements of, yeah, the body plan was similar. But they may have had a totally different ecological role that-

Tracey Peake ([23:11](https://www.rev.com/transcript-editor/shared/OPo-3yy0ll6JxLUDTK5gaa7C-lRohWX5OPz2H9FcFBv7yeqS4pXwewgZFArUF4uv-ZgHeS_C5mJkju8OYffoD0gfF0Y?loadFrom=DocumentDeeplink&ts=1391.25)):

That we just won't know. Yeah.

Lily Hughes ([23:12](https://www.rev.com/transcript-editor/shared/I_GSjEsvTSPLAmpMmiVCJv6_WaFMuoEkhQ09V3pManmGWLtPdixImqRHZI-wK3ADYqdq4ilx_czCZrh1ljLBOWrl82s?loadFrom=DocumentDeeplink&ts=1392.93)):

That we don't know about. They were also existing in a very different world, where there were lots of kinds of jawless fish. There were maybe lots of different ecologies. There may have been quite a bit of change, but they certain, the fossils that we have that we know are lamprey fossils, they look very recognizably like lampreys we see today.

Tracey Peake ([06:12](https://www.rev.com/transcript-editor/shared/yL8sFsTcChAJRbOSbpBhI7VXTwMAFUQ4oFoWF0FxZZLrXot41X7fkniRYutH10_8Vw8wTLK7qrX9gyhuJqsYO9BIZNc?loadFrom=DocumentDeeplink&ts=372.66)):

Okay. All right. Where do they live? Are they everywhere? Are they in the ocean? Are they in rivers? Where do they live?

Lily Hughes ([06:21](https://www.rev.com/transcript-editor/shared/QcDleaVJs-jVGjSW0CZk4CRAbAyT-Wg7g7A0FGWuHWoGLJkbDwbbE07uFWpcRmRDgLYWNQfov2AM9uSwhTIVKsa4ldM?loadFrom=DocumentDeeplink&ts=381.06)):

They live ... A majority of them spend either all or some of their life in freshwater. They are absent from the equator, so they only live in temperate areas of the Northern Hemisphere or the Southern Hemisphere. Many of them will spend their whole life in freshwater. But other species have developed this lifecycle that we call anadromy, where they are born, they hatch out in freshwater, and then they migrate downstream out into the ocean. Many of those are parasitic, so they'll maybe latch onto another fish while they're doing that, or find some food in the ocean. They'll spend a few years in the ocean, feeding, developing. Then when it's time to reproduce, they will come back upstream for reproduction. They usually die after they reproduce.

Tracey Peake ([07:10](https://www.rev.com/transcript-editor/shared/xRT7cY6A2evNPkzZSe8JayZQMT-lk8lfdj77oHj5YP-Dm8j4kxga73EtbMUH7Ex4Grq_aPAICzKEd1y6tmF3VfQWWJ4?loadFrom=DocumentDeeplink&ts=430.59)):

Okay. We're not talking about live birth here?

Lily Hughes ([07:13](https://www.rev.com/transcript-editor/shared/qHipWvE8nAbJFyrtSsffMiFrJPVFLIskEPPOsFa2sWedqn0qqRDG34knlUulWIgkhBE3NGoSOYd3WNrJvM78s65Wnc0?loadFrom=DocumentDeeplink&ts=433.38)):

No. No, no, no.

Tracey Peake ([07:14](https://www.rev.com/transcript-editor/shared/-eu-QmGDwYqT7kPTQxtqB73vI1H8WqQKXaGZnLBfFVRoklqZP1r7Xs_etaZLEn2mDS3g-2D9kBcyTfzgtza1FAnnXvs?loadFrom=DocumentDeeplink&ts=434.49)):

Okay.

Lily Hughes ([07:14](https://www.rev.com/transcript-editor/shared/trUn33PCJRVo0Jl8jbuLqi3p-VvNjWVbDGN52T6AgiSsE5DKwbInTtuSarXats0QogpeodPMuebTz1821Nh2zvVaEtw?loadFrom=DocumentDeeplink&ts=434.52)):

They lay eggs. Yeah.

Tracey Peake ([07:16](https://www.rev.com/transcript-editor/shared/vTI8f1cb2Nv4foVaeG3EcFB1d9jEZzr6KdWoC71wdWai9YDm7shRZd3RlBqiLVPynqAFfTmNxoJBP4jE3dcfX4Q1rCI?loadFrom=DocumentDeeplink&ts=436.74)):

The eggs are just laid on the stream bed?

Lily Hughes ([07:20](https://www.rev.com/transcript-editor/shared/wI6dX4hV05Rq9DbTuCbtD8GpZhOBIlLc0tNRb2xB2EUEvLrC4UZ68q6QvDQkDYbv6gFUhT9zf6UvOjqDBX-UTlRLGM8?loadFrom=DocumentDeeplink&ts=440.16)):

They actually will use that mouth, it's not just for suction feeding, they'll use it to build a nest. They use it to get rocks and build a nest. You can actually find videos of them suctioning rocks up and moving them around together. They work together to build a rock nest, and then they breed on that nest.

Tracey Peake ([07:39](https://www.rev.com/transcript-editor/shared/rg0wUcX_DWtQAV4SKUPp4X2M5KP6daEYeWJrvUDRoR0z7hHaNFM6_kiVibQ06jPQttvA34gF1dc2EO1_0hjkfSuHE18?loadFrom=DocumentDeeplink&ts=459.9)):

Oh, that's very wholesome. They build a little house.

Lily Hughes ([07:43](https://www.rev.com/transcript-editor/shared/PCc_b3dw1oeIpd2mAt_CPzRqT0DPAeTOHiL2PBrmaLJynWNjJZbijizrplZKXzz3c8dpPt_qs78lUyZ9HNoisBY0xF4?loadFrom=DocumentDeeplink&ts=463.62)):

It is very wholesome, yes.

Tracey Peake ([07:46](https://www.rev.com/transcript-editor/shared/WaUVNFXLTwNJ1aA1haobMPb_wNDbSHl99pAyjrYEbj-iMiEM0aNBHS9wMxFd_cjHeryAX90hBB2u48Lm8HWxTCB6mEs?loadFrom=DocumentDeeplink&ts=466.47)):

Well, what about in North Carolina? Are there any species of lamprey here?

Lily Hughes ([07:49](https://www.rev.com/transcript-editor/shared/_l46E2Lw5bffz8wO2pDs-yn5358etvXeZfiuHYtemNzB--OowPDWK_Qc2tUpbBgdMCD-COiWdieANljALl8fwQFqS_4?loadFrom=DocumentDeeplink&ts=469.77)):

Yes, there are. There are actually five species that live in North Carolina. There's the sea lamprey, and that has that anadromous lifecycle where they spend a lot of their life at sea, but they do come into freshwater to breed. We also have the least brook lamprey, the American brook lamprey, the Ohio lamprey, and the mountain brook lamprey. We actually have five different species that live in our state.

Tracey Peake ([08:12](https://www.rev.com/transcript-editor/shared/n7LZq80uOs9Ue8yS4hGf8c2rm15z3azpsUp1LrIWl6NKP-4x1GFvd3rAw0dIv_ttCHFSwKiYMBV9Z--3lZDKGSJcFOc?loadFrom=DocumentDeeplink&ts=492.87)):

Oh, wow. If we went down to the Cape Fear River, could you find a lamprey there? Or is it more streams and littler tributaries?

Lily Hughes ([08:21](https://www.rev.com/transcript-editor/shared/YqekRNldCRPDM58vhEnpt3IWnbB8jKKO6TP-CmkVMPgvryKijXkuyq0F4rQs2WSEw2VJ-2BvFhV1Z1wvxmT7zi6OTCg?loadFrom=DocumentDeeplink&ts=501.87)):

It depends. If the sea lampreys are in the process of migrating back upstream, you might catch them during migration. But not all lampreys spend a lot of their life as adults.

([08:34](https://www.rev.com/transcript-editor/shared/CK7WmHGrT_EUjgCf0gCkUe_-Pb7ownnNBh0B7l1jSgZBsU5bqlIZM-XsHp_JD_Y6219EMcgP0jPEPlVJXLzjbr_PIBo?loadFrom=DocumentDeeplink&ts=514.92)):

Not all lampreys have that parasitic lifecycle. Some of them are what we call non-parasitic. They spend a lot of their time in their juvenile stage, or larval stage, that we call an ammocoete. They look very different. They're blind. They look like little worms almost. They are buried in the sandy substrate of clear flowing streams. They emerge in the springtime, and metamorphize into their adult form. The non-parasitic ones, they don't even have a fully developed gut. They don't eat at all as adults. They reproduce and they die very shortly after. They're only out in their adult stage for a very short period in the springtime. We actually often don't see them that much as adults. They're elusive in that way.

Tracey Peake ([09:24](https://www.rev.com/transcript-editor/shared/fAy1vSUenliqXAP8Az4BWNSDIl7H6ZsDuLot8gHvw2kbAozuBgTgtsSn0oTNs53dDR02eSR_4-SbHcnVCnJF2S9diNA?loadFrom=DocumentDeeplink&ts=564.33)):

Okay. These would not be things that you would necessarily catch?

Lily Hughes ([09:27](https://www.rev.com/transcript-editor/shared/prI2QKgYEfn2X2Hb4nTowSL95QScX3QcmahiYUkGb8RZZQAQoIEb8_QJJ64SOBCwFEzP4N3N4n28NMVi8EPnDKR19UY?loadFrom=DocumentDeeplink&ts=567.66)):

No, not all the time, not every day. They're certainly there, but they might be in their juvenile stage, which is just not that visible to use.

Tracey Peake ([09:36](https://www.rev.com/transcript-editor/shared/zmwQmYqKwahYYxJtqzmHZMwKpNanuE3Lw2E2M4BJ8_jmzj6qmM5KCNsSPMsmgNig4PDUSbzYkewzFlYYzLRTysFa5cM?loadFrom=DocumentDeeplink&ts=576.54)):

Okay. How big are we talking?

Lily Hughes ([09:38](https://www.rev.com/transcript-editor/shared/Y2Jos5kQLOcJ2VBTI5tqyXBj2rSV02hNBoMAUQjD4qpz_DMSGjdV5KlVJD6tYBFklqUrQ0TUefQM9tguTC3HvCWksHg?loadFrom=DocumentDeeplink&ts=578.55)):

The sea lampreys can get pretty big, the ones that go out to sea and they're feeding as adults for a couple of years. The non-parasitic lampreys, like maybe the least brook lamprey, they don't get all that big. Maybe eight inches, 10 inches at the biggest~~.~~

Lily Hughes ([10:05](https://www.rev.com/transcript-editor/shared/r5vEvCNAeuxa2VMQIsd0s-ef-aXO84z5WgFYBNkckH81xbbGqR_fL30YhwjvJwH-Z-muaCy57P5ER_hh4S6GHzVJXk4?loadFrom=DocumentDeeplink&ts=605.94)):

Not very big.

Tracey Peake ([10:06](https://www.rev.com/transcript-editor/shared/AEEAPBpWvHL1kIZ0UC2Vct8iFA4DsYhKa4y2Xi9y1FieYK9l4NzaSnr9dzEGNhLQ72dLlv7FpQ8upYPfQyL7Kq_7uFY?loadFrom=DocumentDeeplink&ts=606.81)):

How big can some of the sea ones, the parasites get?

Lily Hughes ([10:09](https://www.rev.com/transcript-editor/shared/O1A8Cxy_w2t95fZlNgoCGh2B20NcaOhM967lMAr2GFAaOHQ3A0TgHn5GNh5J6hvbbifmTvl8mDKPt-KXiDp-4DKHPLw?loadFrom=DocumentDeeplink&ts=609.45)):

The sea ones can get quite a bit bigger, a couple of feet.

Tracey Peake ([10:12](https://www.rev.com/transcript-editor/shared/t9zJL2637SVKPlD9UlboK7lRD20hsyJrEqjo2Gtrm1lTD_EUKUoSy7X7keS0NYPziCzu1yj7X52S8O6qtsuNoz2SSjA?loadFrom=DocumentDeeplink&ts=612.21)):

Oh, okay.

Lily Hughes ([10:12](https://www.rev.com/transcript-editor/shared/oHgJ8WjMo0k7GEuhks6dJnXwSwUy6bH51v2DpXM3J70xOpDl6J78YoZljQQzaNi8ob6t9UM7IwU9p-ixrzGa7Q_nUpQ?loadFrom=DocumentDeeplink&ts=612.39)):

They're really big ones. They're not necessarily going to get that big.

Tracey Peake ([10:15](https://www.rev.com/transcript-editor/shared/WKkEwv9rKpSa3no02_vdQsaClXenWcmIlhgUtEHA7HAyhAlGEFERXAGFW2jg0VtaooeLXuZC2OfAHxL6G_bGThgQfic?loadFrom=DocumentDeeplink&ts=615.99)):

Right.

Lily Hughes ([10:17](https://www.rev.com/transcript-editor/shared/8LvDqbNrBuCT9BQLl9kNvMHbbYGau9FjSL7BBeSbc6bRwdK6GtTxI2iJ1Zci1sE09Y5HHBMU1auZ6HTN7sTWC4enVcY?loadFrom=DocumentDeeplink&ts=617.28)):

If they're out in the sea for a couple years feeding, they can definitely get pretty large.

Tracey Peake ([10:27](https://www.rev.com/transcript-editor/shared/MYppJ-UnbiBai3eZ2RkAX5ztPNcKCcSJcbnbmjm3VVt_T8mrJWuotGJDl4OW0bO3_aZlUN1W6kDV2WG3e5wpJk-ykTc?loadFrom=DocumentDeeplink&ts=627.57)):

Wow. Okay. With all that said, what role do lampreys play in the ecosystem? The ones in the streams, if they spend most of their time hanging out, what are they doing?

Lily Hughes ([10:40](https://www.rev.com/transcript-editor/shared/56M82s3BeXNZtIpdZwY8WS09ou6Pbw3i8IS0rDI44NUOIxkdxAq6bCelNkH4Ze3F_TcuoKpcn124wNdCloHy7F06lbE?loadFrom=DocumentDeeplink&ts=640.41)):

Most of their lifecycle is spent in this larval or juvenile stage we call an ammocoete. As ammocoetes, they bury down into sandy, salty substrate, and they just filter feed. They filter detritus, they might filter algae, microorganisms. They're not predatory in that way, they're just filter feeding. That can be really important for nutrient cycling in our streams, but they need really clear water. They're sensitive to poor water quality because they're just filtering. If the water quality is really bad, it's not good for them.

([11:15](https://www.rev.com/transcript-editor/shared/a7M5mrM6KOsIDoElr8PMIJN0ZCMKy-0CiT8LFtokq3ee3oc9Qd0o_lbK7BHWzqtqt_OjCQ1AX1G61j5IeGbfFpmJUo0?loadFrom=DocumentDeeplink&ts=675.24)):

As adults, some of them are parasites. Parasites aren't popular, but they are important, they are part of the ecosystem.

Tracey Peake ([11:23](https://www.rev.com/transcript-editor/shared/HQIWRnokHBUvHcRkLd7fKZVsDwZMRNEdw9CPScNb7J03kq_7orbBiUSWSifabTWOJEg9RyBnYF1FvvXKCxVBcj4Qjfw?loadFrom=DocumentDeeplink&ts=683.04)):

Right.

Lily Hughes ([11:23](https://www.rev.com/transcript-editor/shared/-jIQMy8Xs3MhCf49Qo2QHwwNcx2DYu3GgtKpxyGDhdiDGp8a6ZM1qTTut5fROT7mUfuOSy_OdjgjFY-mGE8MSoxqL0U?loadFrom=DocumentDeeplink&ts=683.13)):

There's lots of things that have developed as parasites. But they also can serve as prey for bigger organisms as adults. Other things, other large predators might go after a lamprey.

([11:36](https://www.rev.com/transcript-editor/shared/XGshbwPc_tpNU3bf7boXBvnuBxUzqha36C3AJnjoGA0H_8mZEaHSkNAacwCU3wXAfoLhXqVJSs8mpTfGeqXylzp6UNM?loadFrom=DocumentDeeplink&ts=696.75)):

They do die after they reproduce. So things that are spending a lot of time out in the ocean, and coming back to reproduce in the stream, they're bringing nutrients from the ocean back into the stream. Then when they die, something else will feed on them, too.

I'm not sure which species is the longest, but I think some of them can spend quite a few years in that stage before they come out as adults.

Some of them do spend a long time under the stream bed, just filter feeding.

Tracey Peake ([12:46](https://www.rev.com/transcript-editor/shared/CDDKDDeQRn-IUts5iUeI19lY9R4XqcVTcBkSsDeVpog2N92Wz-U-c4bVquH2kBaYJIH1mOqwAQoyGMB8KslxLx_b4CU?loadFrom=DocumentDeeplink&ts=766.11)):

Doing their thing.

Lily Hughes ([12:46](https://www.rev.com/transcript-editor/shared/tSy_LeS798eby3pug03DdZiUAUnPqEUedEhJi_NmQFj7Clsi3TtAjGhAmU6W6NOqRvOh0aFni3P3fwAx8w3SMnmvHmE?loadFrom=DocumentDeeplink&ts=766.95)):

Not latching on anyone.

Tracey Peake ([12:49](https://www.rev.com/transcript-editor/shared/clFDwMP9gQlt7m5VLB4N70oeAjXDqHYducQH3YlX2Sjl4Ad-Pv6MqnJq4lMoqnanaMXMB6IkDWwTz6CUzKDknqwsRB8?loadFrom=DocumentDeeplink&ts=769.5)):

Not bothering anything.

Lily Hughes ([12:50](https://www.rev.com/transcript-editor/shared/sinNOzufxm1YSuyvlca8kO4kqQz4E26Y4rFUUqzQpIgRbf1ON3nIZ5xk6iBBTZMdgahHo_IYBhHmKLmKkEjw1yGtanY?loadFrom=DocumentDeeplink&ts=770.73)):

Not bothering anything.

Tracey Peake ([12:51](https://www.rev.com/transcript-editor/shared/Qewyuw36ZQvuVabStZWx6wiqhJkHI24oCWEeZSt_V3eBoASPNc1dqveN7Pg9sv7yDtS8aABs5p8kRsjezAs4ebrJCdE?loadFrom=DocumentDeeplink&ts=771.69)):

Not freaking people out with their teeth, none of that. They're just there.

Lily Hughes ([12:54](https://www.rev.com/transcript-editor/shared/Ctbz-uwKQFlhU0bibo-r1lXj54A0GFv8J_xwk2kfx_WjHr6WjvLi4OiGr_1SH2GZOZgDCY0FP3uRIgrUmZ5p_T7iCfc?loadFrom=DocumentDeeplink&ts=774)):

And then, "Rawr!"

Tracey Peake ([12:58](https://www.rev.com/transcript-editor/shared/DtzYg6lxBgVOwYtb0gQV1w-tGLxVDG3bNSM4OhdMzgtGyi4GmP4zyuRmlEfnRp8ip8eQvjV5mmXvqSQI00EXMsNoIZI?loadFrom=DocumentDeeplink&ts=778.92)):

Rawr! Are any of the species of lamprey endangered? Are there any endangered species?

Lily Hughes ([13:03](https://www.rev.com/transcript-editor/shared/ej1FQbmXMtzZYPh5KynOB4Fz2aytECjHeb7mJDGuMlOQVQ_XMtPA36FJQNqkuY4SVSWngN6wh-vbXnTtha64Yw_Y99I?loadFrom=DocumentDeeplink&ts=783.42)):

That's a great question. I think that in the last century, there was an invasion of the sea lamprey into the Great Lakes. That caused this huge fishery crash. There's a lot of information about sea lamprey control in the Great Lakes, because they're not native and they feed on the native fish in the Great Lakes, and it really screwed up the ecosystem. That is something that people think about, lamprey control.

Tracey Peake ([13:32](https://www.rev.com/transcript-editor/shared/2y-ja8wjAW_r8f_-vI0isrlgHn5lCVgZyuMy3xzftyUJf7pSuPJSJVyVh4qwnuC-Y1XQZ_VuZm_mA6559Ft-8YQnn3Q?loadFrom=DocumentDeeplink&ts=812.43)):

Right.

Lily Hughes ([13:32](https://www.rev.com/transcript-editor/shared/-W-HQ1dKbBQygX8KJi3AEAY-qDEcJmRSzX-jUknwBTjgurMhYA8-8W5FrIjmEAKHqsscXW7ESni56MMHzW7wVCjmEv0?loadFrom=DocumentDeeplink&ts=812.58)):

But actually, we don't think that much about our native lampreys that are in our freshwater streams. They do need this really clear, cool water to complete their lifecycle. They spend a lot of time out of our eye. They spend a lot of time in this substrate, buried. Some of them, again, are only out for the springtime to reproduce, and then they're gone.

([13:56](https://www.rev.com/transcript-editor/shared/TVz6TvvoPNhTDyR2dOUo57iak777z8AJXW0Bi5g3xGRemT5Re2yms1NcIwdRfD29thmSZC8fn2296UhCYCkT9-IJ7ec?loadFrom=DocumentDeeplink&ts=836.4)):

I think we actually don't know that much about how our lamprey populations are doing. Certainly, the sea lampreys can be kind of dramatic, and sometimes you'll see them at the aquarium with their big mouth suctioned up at the glass. But some of the smaller species, they're hard to study because they're only out as adults for a very short amount of time. We don't know a lot about how the populations are doing.

([14:23](https://www.rev.com/transcript-editor/shared/MAeRtjRwjKDJtEZWmjy9MgmloMSx0ai9QSZ-mFqfOd8D-aIg9LZj8-sJnjxOIVgd1QMvpkbjOyyIipgxAvmajdAkEmg?loadFrom=DocumentDeeplink&ts=863.61)):

They probably are. We know that they don't respond well to habitat degradation, saltation, water quality issues. We certainly have all of that going on in our streams. I don't think any of them are listed as federally endangered under the Endangered Species Act. But I think some of them are considered, at the state level, species of concern or species that we need more information about.

Tracey Peake ([14:48](https://www.rev.com/transcript-editor/shared/OufBJECHilFZEM-FB6RLlifSaV6UQuuN10igAbvZVPsCjAWEuDu2uttPOlbU5kGZTp6lz97nWdVokNy5VYrHVJ1wHgc?loadFrom=DocumentDeeplink&ts=888.39)):

Okay.

Lily Hughes ([14:48](https://www.rev.com/transcript-editor/shared/Ilyf4CZ--_ZtDaoFatgYLI4_EQUy8xO2lEKVGb1bxHZDpNhQOvKXxuGuKXyBNkwJMeONJQQEBq7MITx4lm1MdvF23Mo?loadFrom=DocumentDeeplink&ts=888.93)):

But because they spend so much of their life buried out of our eye, they can be a real challenge to study.

Tracey Peake ([16:36](https://www.rev.com/transcript-editor/shared/PEYiWJjhKoDkljUoIGB0pem_6gkML858Ic7wQBadaLMi8BuUZOm5nxlulgddH3pXADjh1Prz6cLKGk01_bMG9BpZJaM?loadFrom=DocumentDeeplink&ts=996.57)):

I always like to ask folks, what is the coolest or the weirdest fact that you know about the topic that we're addressing. With lampreys, to me, it's all really weird and cool. I enjoy how they look

([17:07](https://www.rev.com/transcript-editor/shared/Vk-ETLGVV0Jt01Hax8d33xzhXFqvz9a1HAGGJ-ZQ0N_jP-L0lhXap1y0ukKeroPiLFycKRCJfhZcn0-nRT-DcL2UGxw?loadFrom=DocumentDeeplink&ts=1027.17)):

What is the coolest, weird lamprey fact you know? Or even, what is the coolest thing that you've learned as a curator of ichthyology, which is all the fishes?

Lily Hughes ([17:15](https://www.rev.com/transcript-editor/shared/m-XPRc6KM5xCT6wncBFd4Sf0Mdeib-R-GuSU01HcZbOeM27TKOM1rVAeISz9XYOsf2otWqKNy46BI5dwFCsgspL4f9g?loadFrom=DocumentDeeplink&ts=1035.96)):

I am really interested in natural history. I think about all kind of fishes as an ichthyologist. But I also just enjoy history history, human history. While not currently we don't eat lampreys that much, some parts of the world, I think they are still part of the diet. But historically, in Medieval Europe certainly, they were considered a delicacy. People at a lot of lampreys. They also ate a lot of eels. People didn't always distinguish between those things.

([17:49](https://www.rev.com/transcript-editor/shared/E2vOM9_iGSbFYX2PA3123m-gkqN19DQDBfNE3Hyz2exUeJmarih53JERdpyEQcoxRvbglfZ6bIOMr-VxilHr6nYP2Uk?loadFrom=DocumentDeeplink&ts=1069.08)):

But one of my favorite cultural historical facts is that King Henry the First of England is purported to have died from eating too many lampreys. He just loved eating lamprey pie and lampreys so much-

Tracey Peake ([18:06](https://www.rev.com/transcript-editor/shared/kRWVkBqWGmfiTIEneb-vpinEgWM1O62sLqGHRhi78kpemlnqNGMxT55Kdhgti049T7t6fNV4IrjlOCuMm3-MgxJgQQ8?loadFrom=DocumentDeeplink&ts=1086.51)):

Lamprey pie.

Lily Hughes ([18:07](https://www.rev.com/transcript-editor/shared/KzfLuXh2BzaR9XOzWmFsGdJ_NHt6Op0ioEpUXdKiKKQ3NNwvXUdnD6BvzHNPn3PeRrwE5iW8SD11MqAELdR81MEfFqQ?loadFrom=DocumentDeeplink&ts=1087.29)):

He ate too many. The historians at the time, or chronicles around the time said that's what killed him. Whether that is actually what killed him, I can't say.

Tracey Peake ([18:19](https://www.rev.com/transcript-editor/shared/A5sswWeGBCWAV-ZwqYIt61iesUc5mLAC1shKqqfbiPneDiE8O4-xkTfcK8RoRuEDyHJu-6k2MudYoD-5xLAA2dGF2Ms?loadFrom=DocumentDeeplink&ts=1099.95)):

Wow.

Lily Hughes ([18:21](https://www.rev.com/transcript-editor/shared/KK6Om58xhFSeBYxAaskjfYb1Sw9NyI9DhLrTtU0b6efhYTxhcBV2wzW1ZiQCUwnXOvByaPHd0wK9tGpw_EMSh_kyfLM?loadFrom=DocumentDeeplink&ts=1101.84)):

Historically, they were really part of the diet and part of the culture of Medieval Europe, Western Europe.

Tracey Peake ([18:28](https://www.rev.com/transcript-editor/shared/wEfw_sTBUOMlxCZ4IX3sqKnV1083sV2tDGx2_nJsWuKNWdB3Kg479N3oAyf3kXENvSNTrqEKIrYuwvmibJsFGAHpzrg?loadFrom=DocumentDeeplink&ts=1108.74)):

Okay. Well, what is your favorite part of your job as an ichthyologist generally?

Lily Hughes ([18:47](https://www.rev.com/transcript-editor/shared/i9GXAkDjQ4jkCrjUqcShQYgq07LlhUY4xIXe97M3kAm3Fn0A60AweVwThjmT5TLATW69LbGbGRWWKO-yHBnsxw8X3Fg?loadFrom=DocumentDeeplink&ts=1127.13)):

Oh, that's a great question. I really like being able to talk to people about biodiversity, and maybe getting them to appreciate all of the crazy critters that live in our world, and how it came to be. And maybe just get people a little excited about things that they maybe don't get a chance to see that often, or giving people a little sense of wonder about how much biodiversity, how many species and how many adaptations, and just the breadth of things that we share this planet with, I am just wowed by. Getting to share a weird fish, or an interesting fact that gets people's imaginations thinking, and just thinking about all of the animals we have here on our planet, all of the biodiversity we have is really fun.

([19:47](https://www.rev.com/transcript-editor/shared/u3GrbCFTk3JIYbEK_abL7BOKtKZyfY3vZLvQId6rFnDI0vlfhIIgMjpKasu5xe82HHe-gKRxnYZTfQIf2OXLHrluxQk?loadFrom=DocumentDeeplink&ts=1187.58)):

We have a large collection at the museum of 1.4 million fish specimens that are used for research. Not just my research, many, many, many other people's research. We operate like a dead fish library, where we loan specimens or tissue for DNA analysis to researchers all over the world. All of those specimens have all this data behind them about who collected them, where it was collected, when it was collected. That really gives us a picture of where things live in our planet, but also maybe how things are changing.

([20:25](https://www.rev.com/transcript-editor/shared/mLRuTa5B1MTuwTdGojn6hJyzUUh-yoKdPuIRJl7Btnxb4XZs6c9T7ZEfMrT8qSi8Unkf3SKpx0EmobUwIMuUo4fnVuU?loadFrom=DocumentDeeplink&ts=1225.8)):

Our oldest specimens are from 1850, so our collection goes back a fair amount. It gives us this insight into what fish live where, and when in terms of human observation, when did they live there. It gives a sense of change. But it also lets other researchers just ask their own questions, and borrow a fish, and tell a story about it, and do more research. It's cool to be a steward of this broader collection that serves as a springboard for all this other research that people are doing. Including my own, but not just my own.

Tracey Peake ([21:06](https://www.rev.com/transcript-editor/shared/-UUO_0wyU0zhUf1XHbnCDsuitpXUIE4lOiDGgtFVs6yRDMahNoqx1J5QEVTSy6M8VwudaXX33b1GHV-K6aHpzcgOKhU?loadFrom=DocumentDeeplink&ts=1266.57)):

Okay. All right. Well, thank you for coming and talking to me about lampreys. It seems a little off-the-wall, but they're so cool.

Lily Hughes ([23:43](https://www.rev.com/transcript-editor/shared/6Zuh3AlJwpGngIy_cewJHYzXmSO2u-NufXt9rZOB8Llfa9gBx6slgs0-8O74368MIyQo_8fbCyTZOVGK1Y_OHp-EFJY?loadFrom=DocumentDeeplink&ts=1423.62)):

They are.

Tracey Peake ([23:44](https://www.rev.com/transcript-editor/shared/pU0EU1F4_IDPWzCqLSYrFhQiRsApQDbfW_swDA2bg15GDTsNe6hYB7dn0Kv-EMQZeBH9omA5tNXptuMQ3aT0HtIA1E0?loadFrom=DocumentDeeplink&ts=1424.31)):

We have people here that could just talk about lampreys. I was like, "We must tap this resource." I appreciate your time.

([23:52](https://www.rev.com/transcript-editor/shared/9MS7Yu07Vlx48U-O23xtLXos3aNh-iUp2hDh4qE7S_ng6n6UaUUnkza9TO8g-1tCHD5CXfxLxc9kdRLKI2SRbv9d5zE?loadFrom=DocumentDeeplink&ts=1432.92)):

We've been speaking today with Lily Hughes, a research assistant professor at NC State, and the curate of ichthyology at the North Carolina Museum of Natural Sciences. This has been Audio -