Why does SC lab bleed horseshoe crabs for vaccine testing? | The State

thestate.com/news/local/environment/article248306895.html

By Chiara Eisner

Photograph by Ariane Mueller Special to The State

Vaccine testing is changing. Why is this $13B lab still bleeding SC horseshoe crabs?

Horseshoe crabs are at least 445 million years old and grow larger in South Carolina than almost anywhere else in America. Since their blue blood can expertly detect a potentially deadly bacterial toxin, for decades, they've been bled to help develop safe vaccines. But the process that can harm the animals is no longer needed, some scientists say.

Pharmaceutical companies across the U.S. harvest blood from horseshoe crabs to test vaccines. The process may be harmful to the animals, but there is a synthetic alternative. By Loumay Alesali

Horseshoe crabs are rarely seen above water alive. After appearing on the planet about 445 million years ago, the stern-looking arthropods have held on through each of the world's five mass extinctions that wiped out nearly all of their contemporaries, including the dinosaurs, by spending most of their time crawling on the bottom of the ocean.

But during the spring and summer months, often under the cover of night, horseshoe crabs rise from the sea floor to lay and fertilize their eggs in huddled masses on the beaches of the S.C. coast.

“It’s a huge spring orgy,” said Jerry Gault, a second generation fisherman from Beaufort who collects the animals while they’re spawning for Charles River Laboratories. “Forty-five minutes before the high tide, the crabs start coming up. Then it’s a race to get them in a boat.”

Charles River, the only company permitted to purchase the animals in South Carolina, is after their blood. Copper-based and colored light blue, the fluid that runs through their hard bodies is exceptionally good at detecting a bacterial toxin that can cause organ failure or death in humans. For almost 30 years in a facility in Charleston, Charles River has bled the horseshoe crabs, then sold a test for contaminants using the blue blood called LAL, named after the species that lives along the Atlantic, *Limulus polyphemus*.

Pharmaceutical companies in America use LAL to ensure drugs and devices that must be sterile, like the coronavirus vaccines, are free of the toxins. But companies in Europe and Asia have switched to using a synthetic copy of the ingredient that some scientists say works just as well or better. Since it’s made in a lab, the synthetic, called recombinant Factor C, or rFC for short, doesn’t require horseshoe crabs to be captured and bled.

“It is the horseshoe crab protein, it’s just made by a different mechanism,” explained Jay Bolden, a senior biologist at American pharmaceutical giant, Eli Lilly. “We know that rFC is equivalent to or superior to LAL.”

But in South Carolina, where horseshoe crabs grow larger in size than almost anywhere else in the country and nest along a stretch of beaches from Charleston’s Kiawah Island to Hilton Head’s Calibogue Sound, Charles River is clinging to the old industry and standing in the way of the new one.

In Charleston, technicians extract light blue blood from horseshoe crabs to produce LAL. Photograph by Ariane Mueller Special to The State

In the process, the company worth $13 billion has for years presented information to the public that experts say has been misleading and sometimes inaccurate, an investigation by The State Media Co. shows. Never-before-reported emails reveal Charles River knew that harvesters were illegally taking horseshoe crabs from off-limits islands in a S.C. wildlife refuge, and research in previously confidential state documents indicates the animals may be dying at a higher rate after bleeding than what Charles River has claimed. The company's business may have been supported by its oversized influence in groups meant to regulate the industry, conservationists believe.

Representatives for Charles River have told the U.S. Pharmacopoeia, the group in charge of setting standards for ingredients, that it deserves credit for the survival of horseshoe crabs.

"Without the protection of the biomedical industry, these prehistoric creatures would surely become endangered, if not extinct," wrote a representative from Charles River in a 2019 letter it sent to the U.S. Pharmacopoeia.

Others believe the opposite is true.

“Why are we using a wild animal extract when we don’t need to?” asked Ryan Phelan, the executive director of Revive and Restore, a nonprofit that advocates for biotechnology and conservation. “It’s like using whales for lamp oil, it’s like using pigs for insulin.”

For three months, The State spoke to dozens of experts to understand the details of the business at the cusp of a tipping point, and obtained documents from the S.C. Department of Natural Resources and the Atlantic States Marine Fisheries Commission through open records requests.

The information indicates something different than what Charles River has suggested. The reality is wild like the Lowcountry that supports the company. It touches not just on the horseshoe crabs that help rework the marine soil and provide food for shorebirds, fish and crustaceans, but also on the fate of a threatened migratory visitor, the legacy of a famed island of monkeys and a slice of an industry worth more than half a billion dollars.

Jerry Gault hitches up his boat, the Sea Miner, at Gault Seafood on Lady’s Island. Drew Martin dmartin@islandpacket.com

Suppressing the crab-safe synthetic

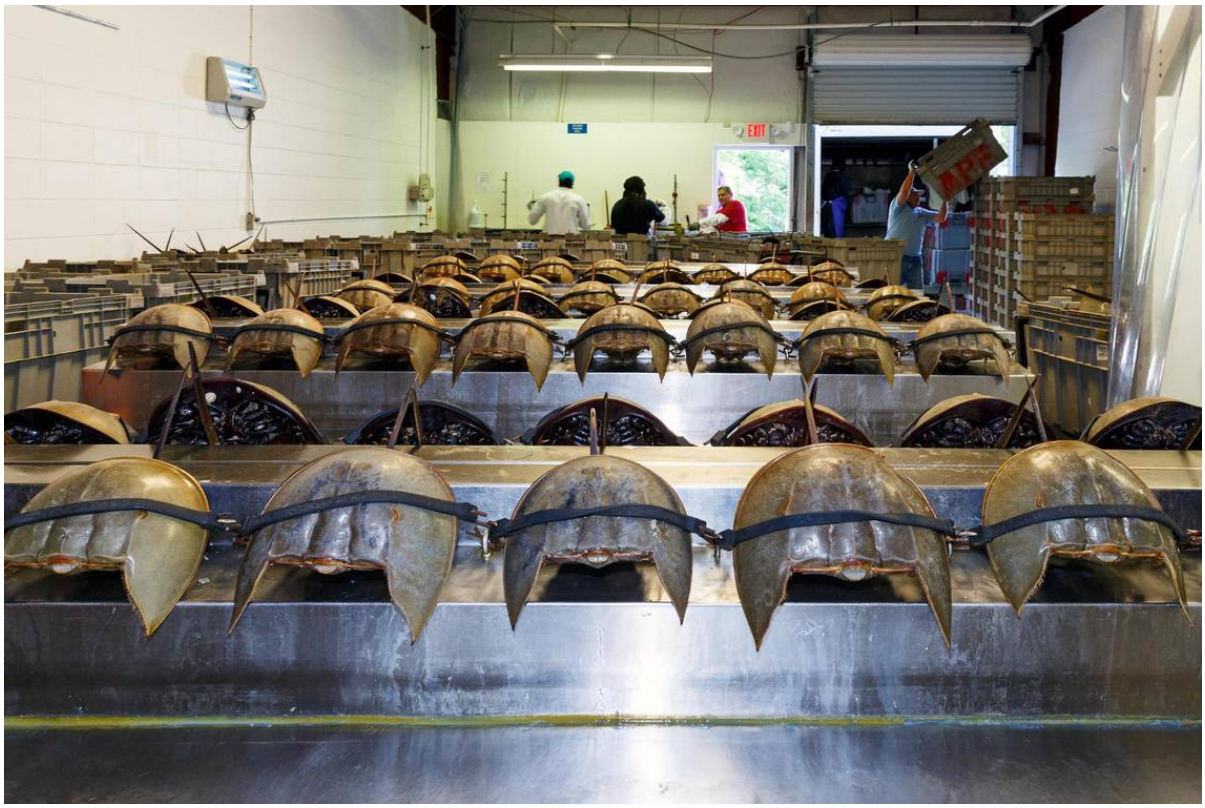
Representatives from Charles River have said that more than 80 million LAL tests are performed annually at a value of over $500 million, and that the company makes the most in the industry.

“We were fifth in a field of five when we started, and now we’re the number one provider of this technology,” said John Dubczak, an executive director for Charles River based in South Carolina.

Though the company has tried to make its own synthetic equivalent to LAL, Charles River has been unsuccessful at manufacturing something that works as well as its blue blooded product, Dubczak indicated.

That’s part of the reason why the company has become one of the main antagonists to the synthetic innovation, believes Dr. Lawrence Niles, a wildlife biologist who co-leads the national Horseshoe Crab Recovery Coalition from New Jersey and has been involved with animal conservation projects for more than 40 years.

“They have a lot to lose from switching over to rFC,” Niles said.



Horseshoe crabs purchased by Charles River are bled while lined in rows on Wappoo Road, Charleston. Photograph by Ariane Mueller Special to The State

Charles River’s statements about the synthetic— a technology first invented over 20 years ago in Singapore and already approved in Europe, Japan and China as an equivalent to LAL — have indicated the company believes it doesn’t provide for a test as effective as the natural one, and more research is needed to prove it does.

“Our position is that this is very exciting, but it requires more development,” Dubczak said.

Last year, the company hired a lobbyist based in Washington D.C. to pressure the government about its opinions on the topic.

“Speedy adoption should not be viewed more favorably than certainty of patient safety,” Charles River urged the U.S. Pharmacopoeia in its 2019 letter.

The efforts seem to have paid off. Half a year after it received Charles River’s letter, the U.S. Pharmacopoeia announced it was canceling a proposal expected to eventually grant the synthetic equivalent status to LAL in America. The decision was “based on stakeholder comments and in accordance with USP’s public process for standards development.”

The group has clarified it is supportive of investigating the use of rFC and may publish a chapter about it later, but that it is taking time to consider the synthetic since “tests using rFC do not benefit from the same level of real-world evidence as LAL.” A committee is expected to vote on a related issue in March.

Some scientists said the information Charles River provided to regulators was misleading.

“When they present data, there is always a spin,” said Dr. Jessica Ponder, a toxicologist at Physicians Committee for Responsible Medicine, a nonprofit based in Washington, D.C. “They want to establish a paradigm where LAL is the gold standard purely on precedent, which is not scientific. The oldest method is not the best method in most of science.”

The pandemic has heightened the urgency to approve the synthetic as an equivalent to LAL, Ponder believes, since there’s a growing demand for vaccines and antibody drugs that have to be tested for contamination.

“I don’t feel safe counting on a limited resource for all of our response to COVID when anything could happen to it,” she said.

Eli Lilly has committed to using only the synthetic equivalent to horseshoe crab blood in all new product testing. Provided by Eli Lilly

The main exception to that is Eli Lilly. In 2016, the company became one of the first in America to start obtaining special permission from the Food and Drug Administration to use rFC when making new products.

Last year, the agency gave Lilly emergency use authorization for a COVID-19 antibody drug, bamlanivimab, which was screened for contamination using the synthetic. After former President Donald Trump received another antibody treatment while infected with COVID-19, his administration agreed to purchase the first doses of the Lilly medicine to ensure it would be available for sick Americans.

“For Eli Lilly, it’s cost favorable,” Bolden said. “You can make a more consistent product batch to batch than you can from pulling animals out of the ocean.”

He’s confident about the safety of the synthetic ingredient the company has trusted for years.

“We’re well over 60,000 samples in, we’ve looked at close to 80 different products at least,” Bolden said. “All the data shows comparability.”

Dubczak believes the Lilly decision to switch to rFC is a mistake, and Dr. James Cooper, who founded the Charleston facility in 1987 and helped pioneer LAL development, said the groups advocating for the synthetic are just trying to gain their own part of the testing market.

In public comments submitted to the U.S. Pharmacopoeia last year, European pharmaceutical representatives were frank about their disapproval of the group's decision that left America behind them, and about what they said was Charles River's role in the delay.

Charles River had been "frightening the future potential user" of the synthetic, wrote a manager from Sanofi, a French multinational pharmaceutical company. The company's evidence had resulted from flawed reasoning, he indicated.

A biologist from the Paul Ehrlich Institute, a German research institution for vaccines and medicines, made a similar remark. Data presented by Charles River had been "misinterpreted by Charles River and the USP as a sign of inferiority of rFC," he wrote. "I feel USP wants to suppress rFC as long as needed for unknown reasons."

Research conducted with the S.C. Department of Natural Resources shows Charles River is not only working to slow the approval of its competitor; it might have more of a negative impact on the horseshoe crabs it still bleeds than it has let on.

Tagging efforts and science funded by DNR have helped establish an understanding of the horseshoe crab population in S.C. Erin Weeks Provided by SC DNR

Not a harmless harvest, research shows

"The horseshoe crab blood donation is similar to human blood donation," wrote Cooper, the Charleston facility founder, in a company publication last year. "The crabs are bled for a few minutes and returned to sea unharmed."

Yet there's a key difference between the bleeding of humans and horseshoe crabs: 15% of horseshoe crabs die because of the biomedical industry's use of them, estimates the Atlantic States Marine Fisheries Commission, a congressionally approved compact of delegates from South Carolina and 14 other states. Other studies have put the death rate between 8% and 30%.

Some industry representatives disagree that the rate is that high, saying the science hasn't always reflected the "Best Management Practices" the industry now uses to care for the animals.

Dubczak told The State in 2020 that "a very, very low percentage" of crabs die from the harvest in South Carolina.

Research conducted by and in collaboration with DNR scientists indicates something different.

The animals are required to be returned to the ocean after they're bled in the state, but more than half of their blood can be extracted first by biomedical companies that drain the liquid for up to eight minutes, research performed by a College of Charleston graduate student with funding from the DNR showed.

"Eight minutes is unofficially recognized as the maximum bleeding time across the industry," confirmed a Charles River representative to The State. On its website, the company mentions it takes less than about a third of the blue blood.

Blood loss due to the extraction has been linked to horseshoe crabs moving less and more slowly after the procedure, and to their decreased ability to express the kinds of tidal rhythms that guide their behavior. But it's not the only factor thought to weaken the crabs after they're released. Stress of capture, being kept above water for hours when their homes are below, mishandling during harvesting and transportation, sun exposure and disorientation from being returned to a different spot from which they were gathered are also believed to eventually contribute to increased mortality.

In the Palmetto State, fishers are permitted to store horseshoe crabs they capture in natural ponds until they're needed by Charles River, a practice that can restrict the animals from their typical spawning grounds during the only

time of year they lay and fertilize eggs.

“It gives us a competitive edge,” said Gault, the Beaufort fisherman. “We can have a consistent supply for the lab.”

Horseshoe crabs are considered public trust resources, which means they are preserved by the government for public use. Provided by Defenders of Wildlife

The College of Charleston research also mimicked the captivity conditions in South Carolina. The scientists found that horseshoe crabs kept in ponds deteriorated physiologically and returned to baseline blood levels slower after being bled, which could weaken their immune defenses in the long term.

And in a study conducted by DNR scientists in 2011, researchers determined that slightly more than 20% of horseshoe crabs tracked by the agency died within two weeks after they were bled by Charles River, records obtained by The State reveal. Just over 4% of horseshoe crabs observed that weren’t bled died in the same time frame — about five times fewer than those that Charles River used.

With the help of previously kept confidential records, The State was able to glimpse something of the impact those conditions might be having on the larger S.C. crab population.

The growing, but hidden, biomedical catch

The five labs collecting horseshoe crabs along the coast, including Charles River, that's headquartered in Massachusetts, are now bleeding over half a million of the animals a year. That's more than double their number in 2004, according to the ASMFC.

The American horseshoe crab species is listed as vulnerable and the overall population is decreasing, according to The International Union for Conservation of Nature. The ASMFC determined in a 2019 stock assessment report that the coast-wide abundance of horseshoe crabs was "likely in a neutral condition," with some regions faring worse than others.

Mel Bell, director of the Office of Fisheries Management within the DNR, said the patterns of the industry at large are typically mirrored in South Carolina.

In fact, the harvest appears to have increased in South Carolina, too. Since five years ago, 41% more fishermen are now permitted to collect horseshoe crabs to be purchased by Charles River, according to figures provided by Bell.

But the status of the horseshoe crab population in the state alone — and the responsibility of the biomedical industry for it — is more difficult to pinpoint. Climate change and weather events are also known threats to the species.

In the 2019 ASMFC report, the authors wrote that horseshoe crab abundance in the Southeast region, which includes the Palmetto State, was in "a good condition." That determination took into account information from other states in the area, however, none of which host commercial harvesters that bleed horseshoe crabs.

To find more precise information, The State obtained annual reports from the DNR and the ASMFC about the horseshoe crab harvest that did show density and abundance research specific to South Carolina, and would have revealed the exact number of animals being taken each year for the past decade from S.C. waters.

While conducting a survey on a SC beach, DNR staffers go over basics about the arthropod. By SC Department of Natural Resources

But there were obstacles in that as well: The amount of animals collected by Charles River and the number known to have died or to have become unresponsive were blacked out in each of the documents provided by the governmental groups.

State Sen. Ronnie Cromer, R-Newberry, who represents South Carolina as a commissioner in the ASMFC, defended the company's right to have that information kept confidential to protect it from competition.

"I don't know what it is either," he told the newspaper.

Not everyone agrees that the privacy afforded the company benefits the public.

"Why the harvesting of public resources should ever be considered confidential business information is beyond me," said Jason Rylander, a senior counsel at Defenders of Wildlife, a nonprofit focused on animal conservation.

The 2019 stock assessment mentioned the lack of transparency about biomedical data across the coast was getting in the way of the commission's job.

"The inability to publicly show regional biomedical collection and mortality data and derivative stock assessment results presents a material constraint to fully explaining the stock assessment results," wrote the authors. "Efforts should be made to improve data access and use however possible."

But thanks to an unusual gap in the harvest in South Carolina, The State found indications of the company's impact on the local population anyway.

When harvest stopped, abundance soared

The gap occurred in 2016, when a building in the Charleston facility on Wappoo Road was under construction. Charles River was expanding its space, Dubczak explained, so no permits for harvesting or possession of the animals were issued to anyone in South Carolina that year, documents obtained by The State confirm.

Before the construction, when Charles River was bleeding horseshoe crabs like it usually does, the 2015 annual report had noted some bad news. DNR surveys showed that density numbers for the population in deep water had continued to decline since 2011, though "the recent densities still represent a high level for the coastal survey," the report stated.

But the next year, when Charles River did not bleed a single horseshoe crab from the state, the records show something surprising happened.

"The density of horseshoe crabs in 2016 was higher than the estimated density in 2015 and was the third highest since 1995, the first year of comparable data," the authors of the annual report noted.

When Charles River returned to harvesting crabs like usual the following year, the density of the animals reverted to a depressed level similar to the one reported before.

Dr. Michael Kendrick, a marine scientist at the DNR, said that other factors besides the lack of commercial harvesting might have played a role in prompting the unusual spike, and that some variability in survey results is to be expected. He recommended consulting a second survey the agency conducts each year — this one a look at horseshoe crabs found on S.C. estuaries — to see if it revealed a similar pattern.

The survey results roughly matched. Horseshoe crab abundance numbers had been low since 2009, the estuary data show, but shot up in 2016. Abundance stayed high through 2017, then dipped back to more characteristically low levels by 2018, two years after Charles River returned to its regular business practices.

Given just one year off from the regular harvest, the abundance of horseshoe crabs in South Carolina appeared to soar — then sink when bleeding started again later.

Now, a lawsuit filed in the South Carolina District Court contends that some of the horseshoe crabs paid for by Charles River were taken by fishermen illegally. Though previously unreported emails reveal the company knew as early as 2014 that the federal government believed fishermen selling the animals to the company were violating regulations, an executive told The State he wasn't aware of it.

Telsons, which may look like stingers or tails, help horseshoe crabs steer and flip themselves over if they get turned around. Erin Weeks Provided by SC DNR

Poaching crabs and endangering birds, nonprofit alleges

At midday on May 12, 2014, Dubczak received an email from the federal government.

“This letter is notification that the collection of horseshoe crabs in Cape Romain National Wildlife Refuge on Marsh Island and/or White Banks Island is in direct violation of refuge specific Federal Regulations,” wrote Sarah Dawsey, then a manager at Cape Romain, to the Charles River executive.

More than half the size of the city of Columbia and located an hour north of Charleston, Cape Romain is a wilderness of salt marshes, barrier islands, beaches, maritime forests and creeks that was set aside in 1932 as a refuge for migratory birds to be managed by the U.S. Fish and Wildlife Service. Almost 300 different species of birds have since been recorded there, including the red knot, a threatened migratory shorebird whose numbers are decreasing.

John Audubon, the famous 19th century ornithologist, wrote that the red knot was “quite abundant in South Carolina, in its autumn and spring migrations.” Provided by The National Audubon Society via audubon.org

On its annual journey north from the bottom tip of South America to the Canadian Arctic where it breeds, the red knot often takes a break in the S.C. refuge to feed on the nutrient-dense eggs of horseshoe crabs.

The shorebirds aren’t just snacking. To adequately fuel the rest of their voyage, one of the longest in the animal kingdom, it’s estimated that a flock of 40,000 red knots would need to eat a whopping 16 billion horseshoe crab eggs in a stopover period, a DNR document reviewed by the newspaper states.

Their opportunity to feast may have been endangered by the illegal harvest of horseshoe crabs from Cape Romain’s closed islands, a lawsuit filed against the U.S. Fish and Wildlife Service by Defenders of Wildlife alleged in October. Though it sent a few letters, the federal government failed to adequately protect animals like the red knot by emboldening the illegal harvest of horseshoe crabs there, the nonprofit contends.

“The Service must suspend the harvest until it evaluates how it can proceed in a manner that no longer puts the refuge at risk,” said Lindsay Dubin, an attorney with Defenders, in a press release.

Harvesters are pictured behind a sign that reads “ISLAND CLOSED” in Cape Romain. Provided by Defenders of Wildlife

In her correspondence with Dubczek in 2014, Dawsey explained that illegal collection of horseshoe crabs had occurred on islands “vital for nesting seabirds and shorebirds, and for migratory shorebirds,” and mentioned that she had spoken previously about the regulations with Dubczak.

“This notification letter completes my efforts to ensure due diligence in contacting all parties involved in the harvest of horseshoe crabs in the Cape Romain National Wildlife Refuge,” Dawsey finished.

By the end of the afternoon, Dubczak had confirmed he received the message. “Thank you for the memorandum,” he wrote to Dawsey, before inviting her to visit Charles River’s facilities.

But when asked by a reporter this December if Charles River had been informed before that harvesters were picking up crabs from where they weren’t supposed to be collecting them, Dubczak said he didn’t know of any instance and denied liability.

“That’s just outside our responsibility,” he answered, after mentioning that fishermen are contractors and not employees — though Charles River pays for the horseshoe crabs brought to them by harvesters.

“That is more of a DNR or Fish and Wildlife issue, but it is something that we are not aware of,” Dubczak told The State.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Cape Romain National Wildlife Refuge
5801 Highway 17 North
Awendaw, South Carolina 29429-5908
Phone (843) 928-3264 Fax (843) 928-3803

May 12, 2014

John Dubczak
Charles River Laboratory
Endotoxin and Microbial Detection
1023 Wappoo Road 43-B
Charleston, SC 29407

Mr. Dubczak:

This letter is notification that the collection of horseshoe crabs in Cape Romain National Wildlife Refuge on Marsh Island and/or White Banks Islands, is in direct violation of refuge specific Federal Regulations as it requires landing and collecting in the intertidal zone of the island.

As specified in 50 Code of Federal Regulations 32.60:

D.5 "We close Marsh Island, White Banks, and Sandy Point to public entry from February 15 through September 15 to protect nesting birds. This closed area extends from the low mean water mark to the highest elevation on these islands."
D.7. All refuge islands are "Closed to Public Entry" or occupancy from 1 hour after legal sunset to 1 hour before legal sunrise, except during a scheduled refuge big game hunt.

Cape Romain National Wildlife Refuge (NWR) is one of 556 national wildlife refuges in the U.S. Fish and Wildlife Service's National Wildlife Refuge System. The refuge was established in 1932 to provide sanctuary, protection, and habitat for migratory birds. Legal responsibilities were later expanded to endangered species and the protection of a 29,000-acre Class I Wilderness Area.

Charles River was informed in 2014 that fishermen delivering horseshoe crabs to them were harvesting them "in direct violation of refuge specific Federal Regulations." Provided by Defenders of Wildlife

His professed ignorance seems helpful for maintaining Charles River's bottom line. Emails exchanged between Cape Romain staffers and published in the court record indicate that the refuge serves as a rich source of blue blood. Over three months of harvesting in 2014, fishermen brought Charles River 25,000 animals to bleed from the refuge, records show.

Potentially losing those profits as a result of the lawsuit may have changed the company's perspective about what Dubczak characterized as Charles River's previously uninvolved position. Less than two months after talking with The State, company lawyers asked permission for the corporation to intervene in the lawsuit.

"Charles River has significant scientific and economic interests in the harvest of horseshoe crabs from the Refuge," they wrote on Jan. 17, 2021. Temporarily pausing the harvest in Cape Romain would "directly and adversely affect

Charles River," the lawyers noted.

Conservationists say the company may be empowered by its oversized influence on regulatory groups.

With regulators, leadership roles and a $15M lease

Over 20 years ago, the ASMFC determined it would consider management action if more than an estimated 57,500 crabs died as a result of only the biomedical industry working along the coast. The mark was first overstepped in 2007, and in 2019, the threshold was crossed by an estimated more than 43,000 dead crabs.

The executive director of the commission, Robert Beal, told The State that the management board hasn't discussed taking responsive measures because the number of dying animals is relatively low. More than eight times as many horseshoe crabs were killed by the bait industry in 2019, he pointed out.

Another reason for the general lack of curtailing the industry by the commission may be the political influence of biomedical representatives on the group, indicated Niles, the wildlife biologist.

Though the LAL industry stands to benefit from permissive policies and favorable status reports, its employees have led the ASMFC's horseshoe crab advisory panel for the past 15 years.

Cooper, the founder of the Charles River facility in South Carolina, served as chair of the group for 12 of those.

After he retired in 2018, a high ranking employee of another company that bleeds crabs in Maryland, Allen Burgenson, assumed the position. When he steps down soon, Burgenson plans to be replaced by the LAL production manager of the company that bleeds the crabs in Massachusetts, Burgenson said.

A technician prepares a group of horseshoe crabs for bleeding at a lab in Virginia in 2000. Steve Helber AP

The former and current panel chairs indicated they've been involved with the advisory panel because they care about the well being of the species.

"I'm on the panel *and* I work for Lonza, not *because* I work for Lonza," Burgenson explained, referring to the Swiss biotechnology company, Lonza Group, that owns the bleeding facility in Maryland.

Their representation is still related to the fact that wealthy corporations that bleed horseshoe crabs for profit pay their salaries, Niles said. Other people, like recreational fishermen, are less able to afford to attend meetings and share opinions, he mentioned.

"The bleeding companies are the ones doing all the talking," Niles remarked. "That's what we're dealing with: A lot of money, a lot of influence on politics, very little responsibility for the resource."

That influence extends to the DNR in South Carolina, indicated Christian Hunt, the Southeast representative of Defenders of Wildlife.

When speaking of its stewardship of the environment in its publications, spokespeople for Charles River often mention that Cooper worked with the DNR to write legislation in the early 1990s that made selling the crabs for anything but biomedical use within South Carolina illegal. The result was a rule that prevented horseshoe crabs from being used as bait to catch other animals, which was a contribution to the species, Cooper said.

“A concern by many marine biologists is that the need for LAL prevents expansion of the bait industry, which has 100% mortality,” Cooper wrote to The State in an email.

But the rules were also self-serving, Hunt believes.

“By drafting the legislation, Charles River really granted themselves a monopoly over the species and cut the public out of the process,” he said.

After the 1990s, Hunt added, the connection between the agency and Charles River has grown into a “financial entanglement.”

Documents obtained by The State show that since 2007, Charles River has paid the agency over $15 million to lease hundreds of acres of land on Morgan Island, a DNR-owned island in Beaufort County that’s home to thousands of rhesus monkeys. Charles River pays the agency to rent the land and take care of the approximately 3,500 Indian-origin primates until they’re needed for research by government scientists.

Morgan Island is home to a breeding colony of approximately 3,500 free-ranging, Indian-origin rhesus monkeys. The (Hilton Head) Island Packet file photo

“The lease of Morgan Island and permitting of horseshoe crab harvest are unrelated,” said Phillip Maier, the deputy director for Marine Resources at DNR and an S.C. commissioner in the ASMFC.

The money DNR earns from the only company that uses horseshoe crabs commercially in the state amounts to a large portion of the Marine Resource Division’s income. In the 2016 fiscal year, the Morgan Island rent made up almost 20% of the group’s revenue. The same division issues permits to horseshoe crab harvesters, who collect the animals for Charles River to bleed.

And the state agency has now been informally looped into the Cape Romain lawsuit that involves its billionaire tenant. Lawyers for the federal government responded to the complaint filed by Defenders of Wildlife by arguing that the case should be dismissed as they believe the state, not the U.S. Fish and Wildlife Service, should be held responsible for any illegal harvesting in Cape Romain. They say it’s the state that has the right and responsibility to authorize harvesters.

Defenders of Wildlife opposed the Service's motion to dismiss on Feb. 1. Lawyers for the Service did not respond to a request for comment from The State. A DNR spokeswoman said the agency could not comment on active litigation.

As the legal battle continues, and while the U.S. Pharmacopoeia deliberates on the equivalency of the blue blood test to its synthetic version, Audubon South Carolina plans to monitor horseshoe crabs on local beaches with help from volunteers during the upcoming spawning season.

The nonprofit has trained residents before to protect shorebirds like the red knot, the migratory bird that gorges on horseshoe crab eggs on its way to the Arctic.

"They stand between where the people want to go and where the birds need to nest," said Nolan Schillerstrom, an associate at the nonprofit.

Schillerstrom hopes that this year, the group can instruct volunteers to look out for horseshoe crabs too, reporting what they see while walking near the surf, like where the animals lay their eggs.

It's support the horseshoe crab didn't have about 250 million years ago when the worst of the mass extinctions events nearly emptied the oceans of life. But the animals didn't have negative interference from humans then, either.

"We're the loudest advocates for the horseshoe crab, we really are," Dubczak told The State.

Hunt disagrees.

"The idea that this species needs Charles River, that's just ludicrous," the Defenders of Wildlife representative said. "The only thing that this crab needs is to be left alone."

Chiara Eisner

Chiara Eisner investigates and reports high-impact stories across the state of South Carolina.