

WTSP Channel 10 NEWS

Science casts net around poachers

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TITUSVILLE, Florida -- Fishermen sometimes spin tales, but DNA doesn't lie.

In one of the biggest Florida grouper cases in years, genetics foiled three Fort Pierce fishermen's plans to fillet the off-limits Goliath grouper, costing them more than \$5,000 combined in fines. They'd sworn the 60 pounds of bagged raw fillets officers caught them with last year was shark.

Such a case might never have stuck before the state began using DNA in fish and animal cases 12 years ago, much at the urging of biologist Hector Cruz-Lopez, who works at Florida's only wildlife forensics lab, which moved last week from Boca Raton to West Palm Beach.

Only 11 other states have similar forensic labs to nab poachers, and not all have DNA capabilities.

"When it comes to species identification, it's close to 100 percent," Cruz-Lopez said.

In the case that led to last month's hefty fines, Florida Fish and Wildlife Officer Tim Miller said he could feel large rib bones through the plastic bags of fillets. Sharks have cartilage, not bones. Then the fishermen claimed it was gag, grey or black grouper, not the Goliath -- banned for harvest since 1990.

Miller drove the fillets to the lab in Boca Raton, where Cruz-Lopez put the fish meat into a DNA sequencer, proving -- "CSI: Miami"-style -- it could only be Goliath.

"I haven't heard of any case that's been lost where DNA was involved," said Lt. Rick Brown, forensics liaison for a 12-county FWC region that includes Brevard.

Samples from those counties pass through the FWC field office off Max Brewer Causeway in Titusville, where Brown coordinates the chain of custody for fish and animal evidence. He stores the feathers, hairs, hides, legs, tails, bones and other animal parts poachers leave behind.

The traces can be remote. But with DNA, state biologists can pinpoint individual deer, by matching a ditched carcass to a blood-spattered truck, or identify a dumped snook to the fisherman's bucket it slimed.

Fessing up

At the Titusville field office, officers fill out orange chain-of-custody cards to move animal parts just a few feet, from a temporary freezer to an evidence storage room across the hall. They must avoid contamination.

The room's double-locked metal door and a chain-linked fence inside secure frozen grouper, sea turtle, sailfish, eagle, bear and alligator parts, whatever poachers think they can get away with.

Sometimes the mere threat of a DNA test of what remains makes them spill their guts.

"They usually just cry uncle," Brown said.

Often, officers have only hair, bones, meat or traces of blood to go on. Even cooked meat can't hide a cattle theft or a fisherman's guilt. DNA can be extracted as long as the meat's not well done, even from sausage that contains many other animal parts.

High tech

Before using DNA, officers relied on immune response and protein tests to determine species. They still do. But those aren't sensitive enough to tell similar species apart.

Wildlife forensics could only draw general conclusions about the family, genus or species. Officers were usually more effective in ruling people out than proving a culprit.

Then in 1975, the United States and about 80 other nations agreed to enforce one another's endangered species laws. Because illegal trafficking typically involved animal parts, officers needed better ways to identify species.

In 1986, the U.S. Fish and Wildlife Service set up the National Fish and Wildlife Forensic Laboratory in Ashland, Ore., the only federal lab of its kind.

Since then, advances in gene mapping and creation of genetics databases of wild and domestic animals has catapulted use of DNA in wildlife, as well as human crime scene investigations.

Science at work

In the most straightforward cases, Brown can perform a simple test with a petri dish, serum and antiserum to debunk hunter lies.

An officer can swab blood from a tailgate or truck bed with a Q-tip and send it to him. He places it into a petri dish, drips serum and antiserum from the animal into the dish. The precipitate that forms can counter a hunter's claims.

"The very basic way of looking at it is like an allergic reaction, like when your nose contacts pollen," Brown said.

But when fishermen fib, and only meat, blood or slime remains, officers often look to genes.

"One of our biggest issues is filleted fish," Brown said.

Enter the polymerase chain reaction. Cruz-Lopez extracts and purifies mitochondrial DNA -- genetic material outside the cell nucleus -- to isolate the species.

He can use nuclear DNA to identify individual deer. In one case, he linked a deer carcass found last year with antlers a South Florida man had in his house.

For fish cases, Cruz-Lopez compares DNA to archive samples of other closely related species, whatever the angler claims it is.

"There are regions of the DNA that are very unique at the species level," Cruz-Lopez said.

With other methods, he can prove a fish's size from just the fillets and its age from only the ear bone.

Paying for itself

Cruz-Lopez said FWC has worked on about 30 cases involving DNA this year, a fairly typical caseload.

By next week, he'll move his forensics lab at Florida Atlantic University to FWC's regional office in West Palm Beach, mostly for improved security.

Cruz-Lopez has studied fish DNA for more than two decades. His first DNA case for the state came in 1998.

A poacher, when confronted by an officer, dumped his bucket, thought to contain a snook out of season. It took just six fish scales and DNA from bloody slime inside the bucket to give him away. He was charged with possession of snook during closed season and found guilty of tampering with evidence, a second-degree felony.

Last year, Cruz-Lopez found trace blood on the nut of an arrow, proving an alligator had been poached.

DNA tests can run \$1,000 to \$1,500.

But the often-airtight evidence they yield results in convictions that usually force offenders to pay the cost of the investigation, in addition to fines.

"With DNA, you either have the right answer or you get no answer. There's no partial answer," Cruz-Lopez said. *Jim Waymer, Florida Today*