Seized ivory probed for clues that could help save elephants

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In this Jan. 8, 2018 photo, Wendy Hapgood, left, and John Steward, directors of the Wild Tomorrow Fund, measure an elephant tusk at a New York State Department of Environmental Conservation warehouse in Albany, N.Y. The tusk was part of a $4.5 million seizure of illegal ivory from a New York City antiques shop. To help support anti-poaching efforts, scientists will use carbon dating to determine when the elephant was killed and DNA analysis to pinpoint where it came from in Africa. (AP Photo/Mary Esch)

Scientists are using information gleaned from both illegal ivory art and elephant dung to provide clues that could help save the lives of pachyderms that are being slaughtered for their tusks in Africa.

The wildlife detective work involves cutting up seized artifacts including bangle bracelets and statues of Chinese deities and subjecting them to carbon dating to determine when the elephants were killed. DNA from the ivory art is then compared to a DNA database derived from elephant dung to pinpoint where they lived.

What scientists learn may not put a particular poacher in jail, but will tell the story of where and when an elephant died on an African savannah so its tusk could be carved in Asia to make a goddess statue priced at $72,000 in a Manhattan antique shop.

"It's going to be really helpful not only for scientific purposes, but also to be able to tell people about the individual lives of elephants that ended up as artwork on our streets," said Wendy Hapgood, director of the Wild Tomorrow Fund, which supports African wildlife preserves, anti-poaching enforcement and efforts to shut down the ivory trade.

The group cut chips from 21 statues, bracelets and mounted tusks that were among $4.5 million in illegal ivory artifacts seized from a Manhattan antiques shop and dramatically destroyed in a rock crusher in Central Park last August. The chips will be analyzed by scientists at Columbia University and the University of Washington.

In this Jan 8, 2018 photo, John Steward, executive director of the Wild Tomorrow Fund, holds an elephant tusk steady while Lt. Jesse Paluch of the New York State Department of Environmental Conservation saws off a sample at a New York State Department of Environmental Conservation warehouse in Albany, N.Y. To help support anti-poaching efforts, scientists will use carbon dating to determine when the elephant was killed and DNA analysis to pinpoint where it came from in Africa. (AP Photo/Mary Esch)

Previous work by the researchers has provided valuable information to focus poaching law enforcement in Africa and prosecute ivory

traffickers elsewhere.

Once numbered at more than a million, the population of African elephants fell 30 percent between 2007 and 2014, to about 350,000, according to the Great Elephant Census funded by wildlife organizations. The decline, at a rate of 8 percent per year, is attributed mainly to poaching for ivory.

The sale of ivory across international boundaries has been banned since 1990. Last year, the U.S. Fish and Wildlife Service instituted a near-total ban on the domestic commercial ivory trade and barred sales across state lines.

Hapgood and colleague John Steward were in Albany recently to saw samples from two massive tusks that were spared the Central Park crusher and locked in a state Department of Environmental Conservation warehouse. The chips will be sent to Columbia University geochemist Kevin Uno, whose radioisotope analysis measures carbon-14 deposited by atomic bomb tests to date the ivory and determine when the elephant died.

In this Jan. 8, 2018 photo, John Steward, left, and Wendy Hapgood, right, directors of the Wild Tomorrow Fund, pose with Lt. Jesse Paluch of the New York State Department of Environmental Conservation pose with a pair of elephant tusks at a New York State Department of Environmental Conservation warehouse in Albany, N.Y. The tusks were part of a $4.5 million illegal ivory seizure from a New York City shop. (AP Photo/Mary Esch)

Samples were also sent to biologist Sam Wasser, of the University of Washington, who extracted DNA from elephant dung all over Africa in the 1990s to map elephant genetics across the continent. Now he

compares DNA from seized ivory to the map to determine where it came from.

Uno and colleagues published a study in 2016 looking at 230 elephant tusks from 15 seizures of shipping containers being illegally transmitted out of Africa. The goal was to determine whether the ivory was from older stockpiles held by African national governments or from elephants recently poached.

"We found 90 percent of the ivory was coming from elephants that died within three years of the seizure date," Uno said.

In a study published in 2015, Wasser's DNA studies on large seizures of ivory found shipments tended to come from a few poaching hotspots. Identification of areas of Tanzania and Zambia as hotspots helped persuade a United Nations agency to deny requests from those countries to sell their ivory stockpiles.

In this Jan. 8, 2018 photo, an elephant tusk that was part of a $4.5 million illegal ivory seizure from a New York City antiques shop lay on a table at a New York State Department of Environmental Conservation warehouse in Albany, N.Y. To help support anti-poaching efforts, scientists will use carbon dating to determine when the elephant was killed and DNA analysis to pinpoint where it came from in Africa. (AP Photo/Mary Esch)

The DNA and radioisotope analysis can also help prosecute traffickers. In 2013, Wasser's lab helped convict an ivory trafficking kingpin in Togo by providing evidence that his ivory came from Cameroon and

Gabon, two of the hardest hit countries in the elephant slaughter. Radioisotope analysis by Lawrence Livermore National Laboratory in California showed the ivory came from elephants killed as recently as 2010, not before the 1989 ban as the trafficker claimed.

"The big study we did was on shipments leaving Africa," Uno said. "Now we're coming at it from the retail side, so if they seize pieces from a shop, how much of it is recent and how much is old."

This Jan. 8, 2018 photo shows a sample of ivory cut from an elephant tusk in a

New York Department of Environmental Conservation warehouse in Albany, N.Y. The ivory sample was part of a $4.5 million illegal ivory seizure from a New York City antiques shop. It will be tested with carbon dating to determine when the elephant was killed and DNA analysis to pinpoint where it came from in Africa. (AP Photo/Mary Esch)

The ultimate goals are to help law enforcement and policy-makers shut down the ivory market and raise public awareness of the plight of pachyderms.

"The extension of that is to slow the killing of elephants and prevent their extinction," Uno said.

In this Aug. 1, 2017 photo, a carved ivory goddess statue is clamped to a work table in preparation for a sample to be cut from it for scientific analysis at the Lamont-Doherty Earth Observatory of Columbia University in Palisades, N.Y.

The statue was among the $4.5 million in artifacts seized from a Manhattan antiques shop and crushed in Central Park in August 2017. Scientists will test it to determine where and when the elephant was slaughtered. (Wild Tomorrow Fund via AP)