

How scientists are using DNA testing to disrupt international ivory smuggling networks

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In recent years, DNA testing has been used to crack cold cases. What if it was used to shed light on international elephant poaching and ivory trafficking?

University of Washington researchers are leading an effort to combat these crimes and dismantle the smuggling network. Their work found that genetic testing on elephant [ivory](#) tusks can be used to identify tusks from the same individual or its relatives, across dozens of different ivory seizures.

"These methods are showing us that a handful of networks are behind a majority of smuggled ivory, and that the connections between these networks are deeper than even our previous research showed," said UW biology professor Samuel Wasser in a news release.

Showing connections between separate ivory seizures, sometimes across continents, will boost evidence against the organizations and people responsible for elephant poaching and ivory smuggling, according to Wasser.

The research was published February in a paper for *Nature Human Behaviour*, in collaboration with other researchers at UW and University of Michigan School for Environment and Sustainability, as well as state, federal and international law enforcement agencies.

The paper expands on previous research published in 2018, in which Wasser and collaborators were able to identify tusks from the same [elephants](#) that were separated and smuggled in different shipments before being seized by law enforcement.

That information showed that between 2011 and 2014, ivory smuggling tended to occur out of three African ports in Kenya, Uganda and Togo.

The new analysis expands the genotyping testing to identify tusks of elephants that were close relatives, like parents, siblings and half siblings. Researchers tested around 4,320 tusks from both forest and savanna elephants collected from 49 separate shipments in 12 different

African nations between 2002 and 2019 and found, for a majority of them, matching tusks from an individual or a relative.

The research shows poachers are likely going back to the same populations year after year, Wasser said.

According to UW, the data found a handful of networks are behind most large ivory shipments, which are often exported from ports in Kenya, Uganda and Nigeria. The analysis also showed how smuggling networks shifted from different ports over time.

The work comes out of UW's Center for Environmental Forensic Science, led by Wasser and UW research scientist John Hermanson, which was established last fall with the help of \$1 million allocated by the state Legislature in 2021.

"Personally, I have a really hard time watching our magnificent wildlife—elephants, rhinoceros, old-growth trees—disappearing before our eyes," state Sen. Jesse Salomon, D-Shoreline, who helped secure the funding, said in a statement.

The interdisciplinary center brings nearly 40 scholars together and collaborates with governmental agencies like U.S. Homeland Security Investigations, the Washington Department of Fish and Wildlife and the U.N. Office on Drugs and Crime.

The center may eventually help with port security, according to UW. While the U.S. Coast Guard attempts to identify suspicious containers, looking for contraband can be like searching for a "needle in the haystack," Port of Seattle Commissioner Fred Felleman said in a news release.

One of the center's projects attempts to address this by training a team

of dogs to sniff for contraband without having to open shipping containers. Air drawn from shipping container vents is passed through odor collection pads, which are presented to dogs at another location. Researchers hope this screening method will eventually be used to detect illegal timber species and wildlife contraband.

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