

# Venomous snakes, freshwater fish among legally traded species most likely to become invasive in US

- *The U.S., the largest importer of wildlife products in the world, brings in nearly 10,000 species of plants and animals into the country legally, some of which have a high potential to become invasive species.*
- *A recent study assessed these imported species and identified 32 as having the highest risk for becoming invasive, posing threats to local ecosystems and to human health.*
- *These include venomous reptiles like puff adders and spitting cobras, and freshwater fish; similar species that have already established themselves as invasives have wrought havoc on native wildlife and caused widespread economic harm.*
- *The researchers say their findings can help authorities regulate the imports of such high-risk species and add them to watchlists to prevent them from becoming invasives.*

Although a superpower, the U.S. is under constant invasion — we’re not talking humans here but meek-looking plants and animals that have caused ecological havoc. Take, for instance, the tiny, nocturnal coqui frogs (*Eleutherodactylus coqui*) in Hawai‘i that arrived from Puerto Rico in the 1980s and are now terrorizing the islanders with their deafening “ko-kee” calls that can be [as loud as a motorcycle engine](#). With numbers in Hawai‘i now surpassing those in Puerto Rico, the frogs have scrubbed the forest floor and treetops of vital pollinating insects, toppled property prices in prime real estate markets, and are hurting tourism.

It’s not just the frogs: [Burmese pythons](#) (*Python bivittatus*), [Argentine black-and-white tegus](#) (*Salvator merianae*), [European starlings](#) (*Sturnus vulgaris*), invasive [carps in the Mississippi](#), [zebra mussels](#) (*Dreissena polymorpha*), [English ivy](#) (*Hedera helix*) — the list is long. Many of these were legally imported, either as ornamental plants, bait or exotic pets, but soon escaped into the wild and established themselves, devastating the local environment and [costing the U.S. economy more than \\$1 trillion](#).

“Prevention is the most effective and cost-efficient way of preventing those impacts that we know that nonnative species can have,” said Wesley Daniel from the U.S. Geological Survey.

A starting point is figuring out which of the thousands of species imported into the country are most likely to become invasive. So that’s what Daniel and his colleagues did. The findings from their [recently published study](#) identified 32 legally traded nonnative vertebrate species in the U.S. that have the highest risk of becoming invasive species, harming not just the environment but also human health.



European starlings, introduced to the U.S. sometime towards the end of the 19th century, have today established themselves across much of North America, displacing many native bird species. Images by (left) PierreSelim via [Wikimedia Commons](#) and (right) Brocken Inaglory via [Wikimedia Commons](#) (CC BY-SA 3.0).

“We’ve identified a subset of species that we think are potentially problematic if they’re released into the wild, and that gives us an opportunity to think critically about legal importation of those species,” Daniel told Mongabay. “The U.S. Fish and Wildlife Service is taking our list and considering those species for further review.”

The researchers sifted through an initial list of nearly 10,000 species by looking at data from the Law Enforcement Management Information System (LEMIS), a database maintained by USFWS that records all wildlife imported into the U.S. and those in the pet trade. They narrowed their list down to 840 species based on how similar the climate is in their native range to that of the U.S. and its territories.

Then, multiple experts, based on what they knew about the species, scored each species on how well it can establish itself, how well it can spread, and its potential impacts. In the end, 32 species — 22 reptiles and nine fish — stood out as “high risk” in the ranked list of vertebrates that can become invasives. All these species are currently legal to trade in the U.S.

The reptiles include venomous snakes such as the puff adder (*Bitis arietans*), zebra spitting cobra (*Naja nigricincta*) and forest cobra (*N. melanoleuca*) — all native to Africa — responsible for [snakebite deaths and injuries](#) in their native range. Others include four species of tree-dwelling snakes and three constricting snakes, which share similar ecological traits with known invasives such as the [brown tree snake](#) (*Boiga irregularis*) and Burmese python, respectively. Predatory monitor lizards (*Varanus* spp.) also featured on the list.

“We don’t need more monitor lizards; there’s plenty down here that already escaped captivity,” Daniel said, referring to the spread of the Argentine black-and-white tegus in Florida. These lizards, originally sold as pets, escaped captivity and became established in Florida’s Everglades in the 2000s, causing widespread damage, including eating alligator eggs, threatened gopher tortoises and even agricultural crops. The state has since [spent millions](#) to remove them, and the lizards are now considered a prohibited species to own in Florida and Georgia.

The nine fish species identified as high risk for becoming invasive are those that are either traded as pets or in aquaculture. Many are already considered invasive species elsewhere, such as the common bream (*Abramis brama*), from Europe, and ornamental fish like the blood-red jewel cichlid (*Hemichromis lifalili*), native to the Congo Basin.



(Left) Argentine black and white tegu, were first brought into the U.S. for the pet trade, but a few escaped captivity and became established in Florida’s Everglades causing widespread ecological damage, including eating American alligator eggs and the threatened gopher tortoises. (Right) The blood-red jewel cichlid is a common aquarium fish. the study identifies it as a ‘high-risk’ species that could become invasive in the U.S. Images by (left) Gustavo Fernando Durán via [iNaturalist](#) (CC BY-NC-SA 4.0) and (right) Hectonichus via [Wikimedia Commons](#) (CC BY-SA 3.0).

Although no birds, mammals or amphibians were considered high risk, the study identified 54 bird, 11 mammal and one amphibian species as medium risk.

“Wildlife trade is a massive and underestimated threat to many species, but also poses a threat to species in the country it is imported to,” wildlife trade researcher Alice Hughes from the University of Hong Kong, who wasn’t involved in the study, told Mongabay by email. She added that in addition to the species themselves being a threat, they can bring in pests and pathogens that affect native species.

“This study explores the magnitude of the potential threat [and] reinforces what we know about the risks of importing wildlife,” Hughes said.

The list of high-risk species provides a starting point for agencies such as USFWS to dive deeper into the specific risks they pose, and restrict or regulate their import by adding them to [injurious wildlife listings](#). Daniel said USFWS is already using the list the study’s authors prepared to assess each of the high-, medium- and low-risk species individually. The state of Arkansas is also studying the list of high-risk fish to develop new regulations.

“We hope other tribes and territories and states can also get on and look within their jurisdiction where there could be risky species, and start making some of those own decisions about policy,” Daniel said.

**Banner image:** *Puff Adder, a venomous snake from Africa, topped the list of vertebrates with the highest risk of being invasive in the U.S. Image by Christiaan Viljoen via [iNaturalist \(CC BY 4.0\)](#).*

#### Citations:

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