




**Consequences of
Wildlife Trade in the
Eastern Caribbean:
Impact of Invasive Alien Species (IAS) on
Native Flora and Fauna**



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What are Invasive Alien Species?


IAS are plants, animals or micro-organisms that are not native to a specific ecosystem and whose introduction threatens biodiversity, food security, health or economic development.

- **Invasive:** they harm other species by taking over their habitat
- **Alien:** foreign, exotic, not native, often pioneer species
Alien species arrive without the natural enemies (e.g. predators) they had at home
- They reproduce often prolifically

What are Invasive Alien Species?

The global cost of IAS is estimated at \$1.4 trillion per year (nearly 5% GDP) – and rising in times of globalization and climate change

- Legal wildlife trade: US\$ 10 billion
- Illegal wildlife trade: US\$ 5 billion
- Prevention of new IAS Introductions
- Early Detection and Rapid Response:
- Control populations and impact of IAS



African vervet monkey

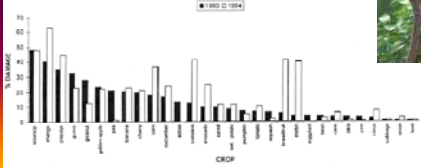


Fig. 8. The mean percentage damage to cereal crops in Burkina Faso in 1982 and 1994.

Key Risk Factors

- Traded animals can become invasive if escape/released into new environment
 - Some are ferocious predators or strong competitors
 - Lionfish escaped from public aquarium after hurricane damage
 - Owners release specimen that seem too large, expensive or tedious to keep, e.g. red-eared slider terrapin
- Wildlife can vector pathogens and parasites
 - Illegally imported wildlife is high risk a vectors for pests, diseases and parasites
 - Species that would never meet in nature meet in trade hubs and in transit
 - New encounter diseases in destination country
- Herbivores can introduce seeds of invasive plants in their digestive tract



Political Geography of Eastern Caribbean

The Wider Caribbean Region





and the "arbitrary East"

Legal Situation of Eastern Caribbean

- 9 OECS members, all are CARICOM members/associates
 - Anguilla
 - British Virgin Islands
 - Grenada
 - St. Lucia
 - St. Vincent and the Grenadines
 - Antigua & Barbuda
 - Dominica
 - Montserrat
 - St. Kitts & Nevis
- French Overseas Departments (*départements d'outre-mer*)
 - Martinique & Guadeloupe
 - Laws of mainland France and European Union (EU) apply
- French Territories (*collectivités d'outre-mer*)
 - Saint Barthélemy and Saint Martin
 - Autonomous legislation prevails

Legal Situation of Eastern Caribbean

- **Netherland Antilles**
 - Saba, Sint Eustatius, Sint Maarten
 - Autonomous countries within Kingdom of the Netherlands
 - Own legislation
 - EU laws do not apply, but inhabitants are Dutch (EU) citizens
 - Generally MEAs signed by the Netherlands apply
 - Dutch Antilles have signed bilateral agreements independently
- **United Kingdom Overseas Territories (UKOTs)**
 - Anguilla, British Virgin Islands and Montserrat,
 - Autonomous legislation prevails
 - EU law does not apply
 - Multilateral Environmental Agreements (MEAs) signed by the UK need to be extended to the OTs to become applicable

MEA Participation in Eastern Caribbean

Country	CBD	CMS	CITES	Convention on Biological Diversity	SPAW Protocol	WTO GATS for Basic Telecommunications	WTO Ind. Health Reg.	OIE	WTO SPS Agreement	Agreement on Imp. Facilitation of Car. Movement
Antigua & Barbuda	Party	Party	Party	Party	Signatory	Member	Member	-	Member	-
Barbados	Party	-	Party	Party	Party	Member	Member	Member	Member	Party
Dominica	Party	-	Party	Party	-	Member	Member	-	Member	-
Grenada	Party	-	Party	Party	-	Member	Member	-	Member	-
Guyana	Party	-	Party	-	-	Member	Member	Member	Member	-
St. Kitts & Nevis	Party	-	Party	Party	-	Member	Member	-	Member	-
St. Lucia	Party	-	Party	Party	Party	Member	Member	-	Member	-
St. Vincent & Grenadines	Party	-	Party	Party	Party	Member	Member	-	Member	-
Suriname	Party	-	Party	-	-	Member	Member	Member	Member	-
Trinidad & Tobago	Party	-	Party	Party	Party	Member	Member	Member	Member	-
<i>OTs of France</i>										
Martinique	Applies	Party	Applies	Party	Applies	Applies	Applies	Member	Applies	Applies
Guadeloupe	Applies	Party	Applies	Party	Applies	Applies	Applies	Member	Applies	Applies
Saint Martin	Party	-	Party	Party	Applies	- ?	?	?	?	-
<i>OTs of Netherlands</i>										
Netherlands Antilles	Party	Party	Party	Party	Party	Member	Member	Member	Member	Applies
<i>OTs of UK</i>										
Anguilla	-	-	Applies	Party	-	Member	Apply	Member?	?	Applies
British Virgin Islands	Applies	Applies	Applies	Applies	-	Member	Apply	Member?	?	-
Montserrat	Applies	Applies	Applies	-	-	-	Apply	Member?	?	Applies

Types of Wildlife Trade

- **Food-related wildlife trade**
 - Agri-, api- and aquaculture
 - Game and live seafood
 - Baits
- **Pet and aquarium trade, research and pleasure:**
 - registered, formal pet shops
 - informal breeders are not registered, monitored or controlled
 - increased interest in exotic pets, no/poor post-sale regulations
 - scientific research (laboratory test animals)
 - conservation (re-location, metapopulations)
 - supplies for zoos and circuses, including feed
- **Illegal wildlife trade**
 - trans-boundary smuggling
 - internet trade
 - outlawed cultural activities, e.g. cock-fighting

US\$ 10 billion

US\$ 5 billion
Source: ELI

Food-related Wildlife Trade: Game



Severe Acute Respiratory Syndrome (SARS)

ORDER OF THE CENTERS FOR DISEASE CONTROL AND PREVENTION, DEPARTMENT OF HEALTH AND HUMAN SERVICES

Notice of Embargo of Civets

May 3, 2005
Download PDF version formatted for print (22 KB/4 pages)

ACTION: Notice of embargo of civets (Family: Viverridae).

SUMMARY: According to published scientific articles, Severe Acute Respiratory Syndrome (SARS)-like virus has been isolated from civets (Family: Viverridae) captured in areas of China where the 2002-2003 SARS outbreak originated. Shipments of civets are being imported into the United States and further distributed. CDC is banning the importation of all civets immediately and until further notice. CDC is taking this action to prevent the importation and spread of SARS, a communicable disease.

DATE: This embargo is effective on January 13, 2004, and will remain in effect until further notice.

- First outbreak: November 2002 in China
- 8273 cases globally, fatality 9.6%
- Public spotlight: February 2003
- International experts admitted: April 2003




Food-related Wildlife Trade – *Examples in Caribbean Region*







Aquarium and Pet Trade – *Regional Examples*

CARIBBEAN BUSINESS
caribbeanbusinesspr.com
Puerto Rico's #1 news and information website in English
Growing caiman count in SJ estuary causes alarm
By: CLOUTIER, KERRY
14 October 2010
http://www.caribbeanbusinesspr.com

Invasive caimans are making themselves at home in the densely populated Puerto Rican capital and pose a potential threat to humans and pets, researchers said Wednesday.

The news made by the San Juan Bay Estuary Program does not reduce the reptile's total population, but indicates rapid growth in one place on a street right and have been found in adjacent areas.

The caimans are believed to be the descendants of pets brought to the island in the 1950s and are now breeding in the estuary, which is surrounded by more than 300,000 people.

What happens in the tropical estuary, a mix of forest and built, shallow that was given to man that is hard to control.

There have been no human attacks on humans.

However, the reptiles are drinking water freely and kill. Several Puerto Rican citizens have been bitten and hospitalized.

Caution said. He plans to meet with government officials to develop an eradication plan.




Piranhas are being banned in some countries



Pacific lionfish



African clawed frogs vectored chytridiomycosis

Red-eared slider: tolerant and omnivorous




Aquarium and Pet Trade – Regional Examples



Suriname parrot positive for deadly strain of bird flu
AP
Monday, October 24, 2005

LONDON, United Kingdom (AP) - The British government said Sunday that a strain of bird flu that killed a parrot in quarantine is the H5N1 strain that can be lethal to humans.

Scientists determined that the parrot, imported from South America, died of the strain of avian flu that has killed more than 60 people in Asia, the Department for Environment, Food and Rural Affairs said in a statement.

Suriname authorities said Saturday that the parrot had tested negative for the disease before it was shipped, blaming the bird's death on contamination with birds from Asia under quarantine.


DEFRA's chief vet, Cobby Reynolds, said it seemed likely the parrot was infected with the flu virus while in the quarantine system, in a facility it was sharing with birds from Taiwan.




Pionus menstruus




Aquarium and Pet Trade – Regional Examples




Heterospecific harassment of native endangered fishes by invasive guppies in Mexico
Alejandra Valero, Constantero Macías Garcia and Anne E Magurran
Biol J Linn Soc 2008, 4, 420-423
doi: 10.1098/ipl.2007.0504



➤ Caribbean is source of popular guppy (*Poecilia reticulata*)




- Prolific live-bearer
- Several generations after mating once




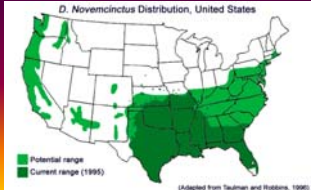
Research

➤ Nine-banded armadillo

- Gives birth to identical quadruplets
- Carrier of fastidious leprosy bacterium
- ⇒ medical research
- South & Central American origin
- Introductions into USA 1920-1970
- Expanding range in Eastern US
- Omnivore: preys in turtle eggs
- Burrows: nuisance species







D. novemcinctus Distribution, United States

Legend: Potential range (light green), Current range (1995) (dark green)

(Adapted from Paulson and Robinson, 1992)

Research, Conservation, Pleasure & Decadence

- Zoological translocations
 - Species that would never meet in nature meet in zoos
 - Many exotic diseases are still unknown
 - Co-evolved animals can be symptomless pathogen carriers
 - Stress compromised immune system of translocated individuals
- Game breeding and release
 - Feral pigs impact flora and fauna
 - African purple swamphen in Florida
- Mink farms for fur
 - Animal rights activists in Europe have released this predator into the wild, where they behave invasively




Pet & Aquarium Trade, Research and Pleasure

the Saint Lucian Situation

- All animals require an import permit from the MALFF and a health certificate from the country of origin.
- Exotic species have to meet CITES and Forestry Department (Wildlife) specifications.
- Wildlife Act stipulates a permit for keeping wildlife, which is defined as "...living beyond the control of man"

=> Legal gap regarding non-native species obtained from local source and in captivity

=> Amendment proposed to cover all species declared invasive



Illegal Wildlife Trade

- Illegally imported pets are high risk as vectors for pests, diseases and parasites
- Informal breeders are often poorly informed about animal needs and risks (health and escape/release)
- Original perpetrator(s) hard to determine




Case Study: *the Alien Iguana in Saint Lucia*

Alien Invasive Iguana
Clutch size: 40-80 eggs?

Iyanola
Clutch size: 20-25 eggs

Alien Iguana in Saint Lucia

- Potential Impact
 - Could compete with St. Lucia iguana for food and nesting sites
 - Could hybridize with St. Lucia iguana, eliminating its uniqueness and destroying the *iyanela* concept
 - Alien iguanas imported illegally can carry diseases
 - Damaged crops and drains

Iyanola
Photo by Stuart Brooker

Early Detection and Eradication of Alien Iguana

- Diversify capture approaches:
 - intensified visual search, capture & euthanasia
 - revised trapping grid
 - sniffer dogs?

intensified visual search, capture & euthanasia

revised trapping grid

sniffer dogs?

Recommendations

- Efficient international communication is required
- Harmonization of regulatory framework is needed
- Should liaise closely with, but also aim to exceed, OECS and CARICOM mandate region



Recommendations

- The private sector must be involved to resolve conflicts of interest
- Develop Voluntary Codes of Conduct (VCCs) e.g. following National Invasive Species Strategy for the Bahamas, which offers VCCs for:
 - Zoos and Aquaria
 - Farms (Agricultural and Aquacultural)
 - Pet Stores, Breeders and Dealers
 - Pet Owners
 - Veterinariansthat could be adapted to other countries/territories
www.best.bs/Documents/bahamas_nationalstrategy.doc

Recommendations

- Apply Pet Trade Pathway Toolkit of the Global Invasive Species Programme (GISP; in preparation)
 - Animal inspection, acclimation and quarantine protocols/plans
 - Biosecurity measures: housing, packaging and handling
 - Care sheets
 - Code of conduct/practice
 - Consumer education//outreach campaign
 - Consumer record keeping
 - Industry education//outreach campaign
 - Rehoming programmes
 - Same gender programmes
 - Spey/neuter programmes