Animals Make a Better World

Conservation Forensics @ HKU

Dr David Baker
School of Biological Sciences
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Trans-national crime

| Crime                        | Value
<table>
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<tbody>
<tr>
<td>Counterfeiting</td>
<td>$923 billion to $1.13 trillion</td>
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<tr>
<td>Drug Trafficking</td>
<td>$426 billion to $652 billion</td>
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<td>Illegal Logging</td>
<td>$52 billion to $157 billion</td>
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<tr>
<td>Human Trafficking</td>
<td>$150.2 billion</td>
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<td>Illegal Mining</td>
<td>$12 billion to $48 billion</td>
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<td>IUU Fishing</td>
<td>$15.5 billion to $36.4 billion</td>
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<tr>
<td>Illegal Wildlife Trade</td>
<td>$5 billion to $23 billion</td>
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<td>Crude Oil Theft</td>
<td>$5.2 billion to $11.9 billion</td>
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<tr>
<td>Small Arms &amp; Light Weapons Trafficking</td>
<td>$1.7 billion to $3.5 billion</td>
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<tr>
<td>Organ Trafficking</td>
<td>$840 million to $1.7 billion</td>
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<td>Trafficking in Cultural Property</td>
<td>$1.2 billion to $1.6 billion</td>
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<tr>
<td>Total</td>
<td>$1.6 trillion to $2.2 trillion</td>
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Source: Transnational Crime and the Developing World
Supply & demand

- rare species = limited supply + unlimited demand = prices exceeding narcotics and precious metals
- profit margins are often huge; reward >> risk
- exploitation of impoverished people
Hong Kong is a wildlife trade hub

- Hong Kong is a **global epicenter** for wildlife trade.
- Serves as a **link** between different parts of Asia.
- An **importer and re-exporter** to markets into demand countries e.g. China, Japan, Korea.
- **TCM, exotic pets, seafood, ornamental trade...**
Illegal trade: seizures

Three arrested after Hong Kong customs seizes 7.2 tonnes of ivory from ‘frozen fish’ container in record HK$72 million bust

Male proprietor and two female staff members of trading company in Tuen Mun nabbed

More than 580 people arrested, HK$53 million in illicit goods seized by Hong Kong customs over Lunar New Year

The confiscated items ranged from counterfeit products to drugs and wildlife parts from endangered species

HK$2.7 million worth of ivory seized by Hong Kong customs in joint operation with mainland Chinese authorities

Eight people are arrested including alleged mastermind of the scheme
Easy to launder

Difficult to monitor and enforce laws
Cross-border itinerant poaching of agarwood in Hong Kong’s peri-urban forests

C.Y. Jim

Department of Geography, The University of Hong Kong, Pokfulam Road, Hong Kong, Hong Kong

Contribution Biology

Demographic Evidence of Illegal Harvesting of an Endangered Asian Turtle

YIK-HEI SUNG, NANCY E. KARRAKER, † AND BILLY C. H. HAU

School of Biological Sciences, The University of Hong Kong, Hong Kong SAR, China

Abstract: Harvesting pressure on Asian freshwater turtles is severe, and dramatic population declines of these turtles are being driven by unsustainable collection for food markets, pet trade, and traditional Chinese medicine. Populations of big-headed turtle (Platysternon megacephalum) have declined substantially across its distribution, particularly in China, because of overcollection. To understand the effects of chronic harvesting pressure on big-headed turtle populations, we examined the effects of illegal harvesting on the demography of populations in Hong Kong, where some populations still exist. We used mark-recapture methods to compare demographic characteristics between sites with harvesting histories and one site in a fully protected area. Sites with a history of illegal turtle harvesting were characterized by the absence of large adults and skewed ratios of juveniles to adults, which may have negative implications for the long-term viability of populations. These sites also had lower densities of adults and smaller adult body sizes than the protected site. Given that populations throughout most of the species’ range are heavily harvested and individuals are increasingly difficult to find in mainland China, the illegal collection of turtles from incubations in Hong Kong may...
Capacity building - HKU

Centre for Conservation Forensics
The University of Hong Kong

Started ~3 years ago
Academic and forensics research
Contract work
European eels

First genetic evidence of illegal trade in endangered European eel (Anguilla anguilla) from Europe to Asia

Illegal eel: who is pilfering Europe’s catch?

In part two of the eel saga, I take a more detailed look at how the pieces of the trade fit together, and what’s being done to combat it.

Emma Bryce
Thursday 31 March 2016 13.21 BST

This is my second blog about the illegal trade of eel between Europe and Asia. In the first I wrote about the ecological plight of the eel and the scale of the trade. You can read that post here.

Critically Endangered European eels (Anguilla anguilla) in glass eel stage

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Leading to 40 arrests in the EU
European eels

How much of the eel sold in HK supermarkets is A. anguilla?

COI barcoding

~50% were A. anguilla (> official import statistics)

Mislabeling

Potential infiltration of commercial market with black-market

**ENFORCEMENT** Trafficking can be targeted, as all supermarkets were under one of two suppliers in HK
Where does it come from?

Ornamental Trade:
Helmeted hornbill casques

Traditional Chinese Medicine:
African pangolin scales

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• Information on poaching hotspots
• True origin of seized products
• Trade routes
Live reef fish – wet markets

- Isolate eDNA from wet market drains
- Amplify using MiFish primers
- Sequence and screen for illegal/protected species
Captive bred or wild-caught?

Live Reef Food Fish Trade:
The Humphead Wrasse

CITES App. II

Exotic Pet Trade:
The Yellow-Crested Cockatoo

CITES App. I
Digital fingerprinting

Individual facial markings = fingerprint

Digital photo-ID

App for enforcement officers

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Trade monitoring and inspections
Rapid screening - shark fins

- Shark fins: morphological differences before bleaching
- Machine learning algorithms: visual ID
- App for enforcement officers

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To determine legality at point of seizure
Contract work, collaborators, funders
THANK YOU