



CENTRE FOR
INVASIVE SPECIES SOLUTIONS



Australian Government
Australian Research Council



An Australian Research Council Special Research Initiative

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Environment Institute | Invasion Science & Wildlife Ecology

Understanding and intervening in illegal trade in non-native species



Living and working on Kaurna Country

CISS Incursions Software tools Meeting

- Background
 - EBO October webinar *“Biosecurity risks in focus - Contaminants & commerce”*
- CISS projects on detecting online trade in illegal species
- Stakeholder feedback & input

Invasion Science & Wildlife Ecology

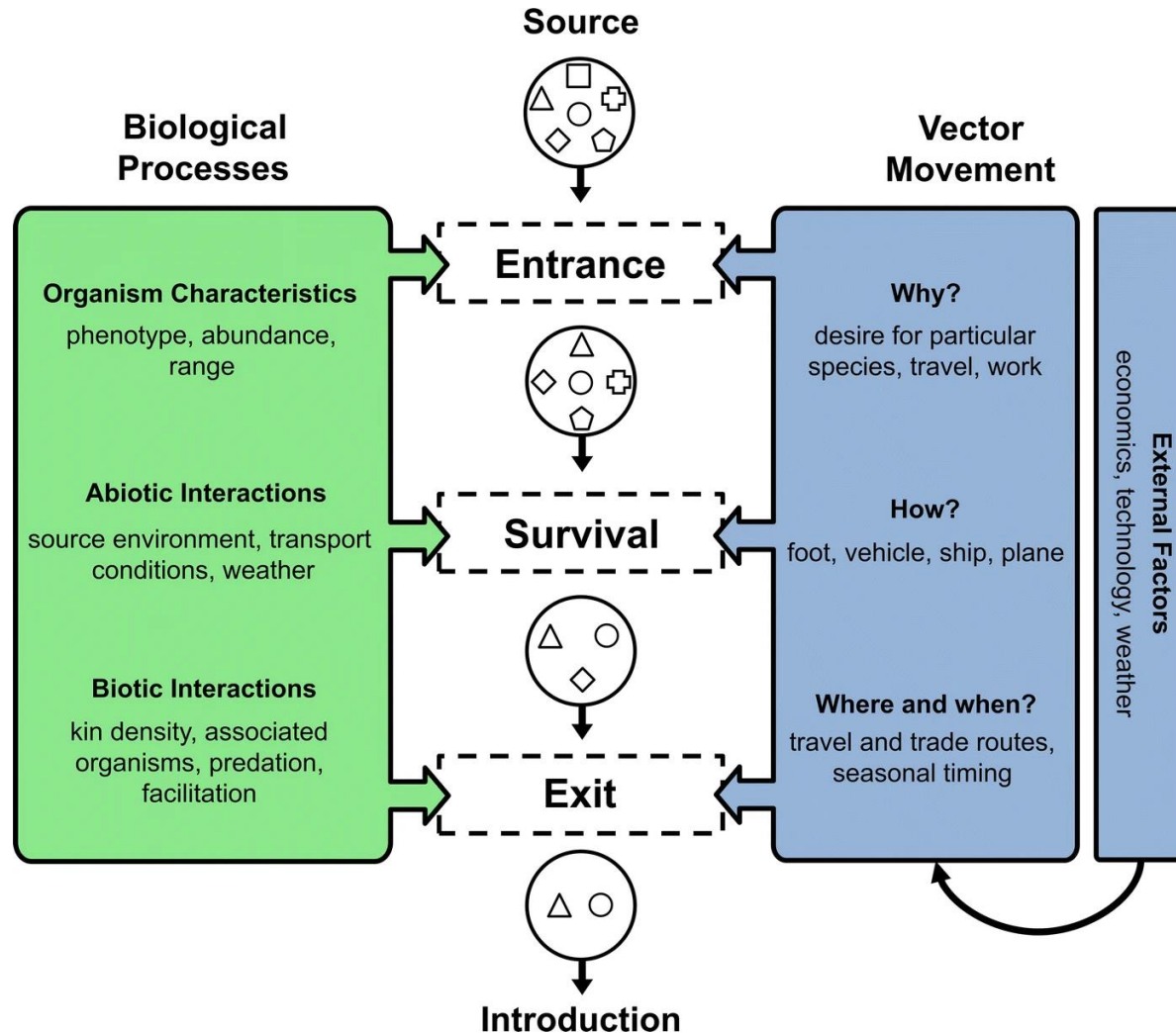
Our multidisciplinary research group brings critical analytical and practical techniques to the study of:

- ❖ Wildlife Conservation
- ❖ Biosecurity Risk Management
- ❖ Applied Ecology



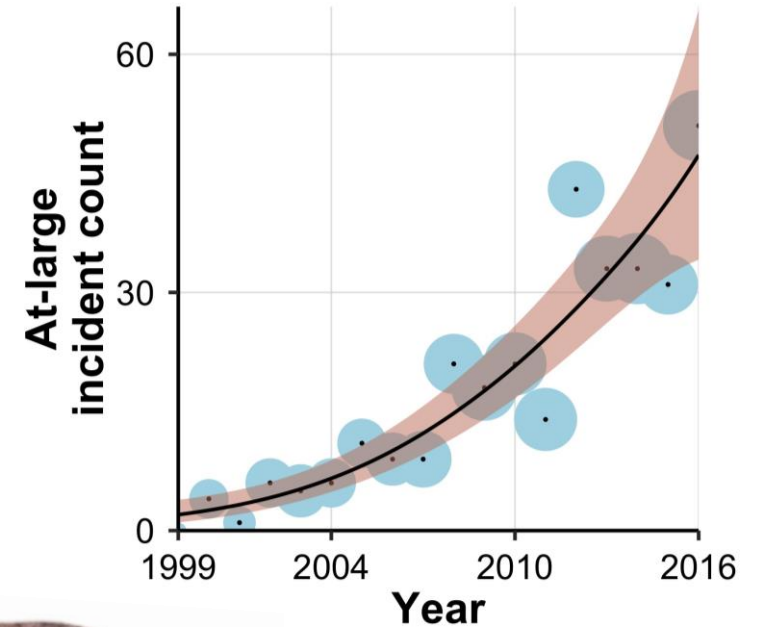
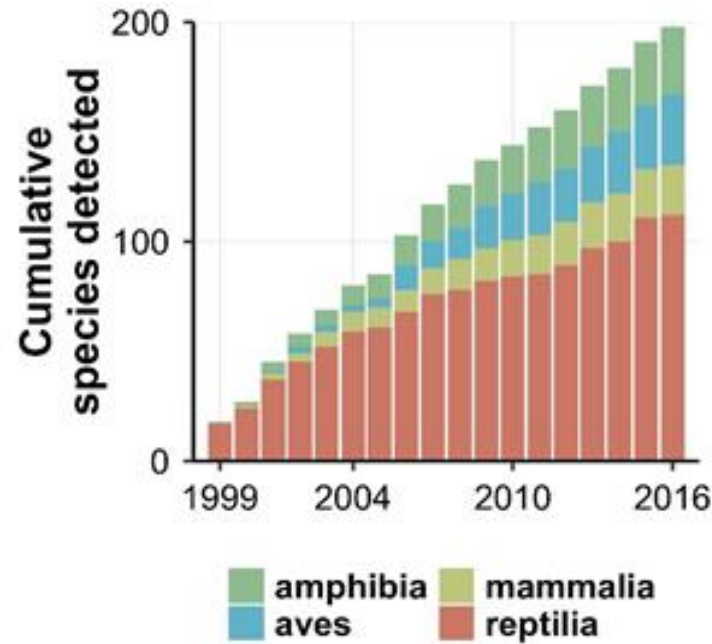
IN THIS LAB,
KINDNESS MATTERS
+ EVERYONE HAS A VOICE

A framework for predicting entrainment of IAS



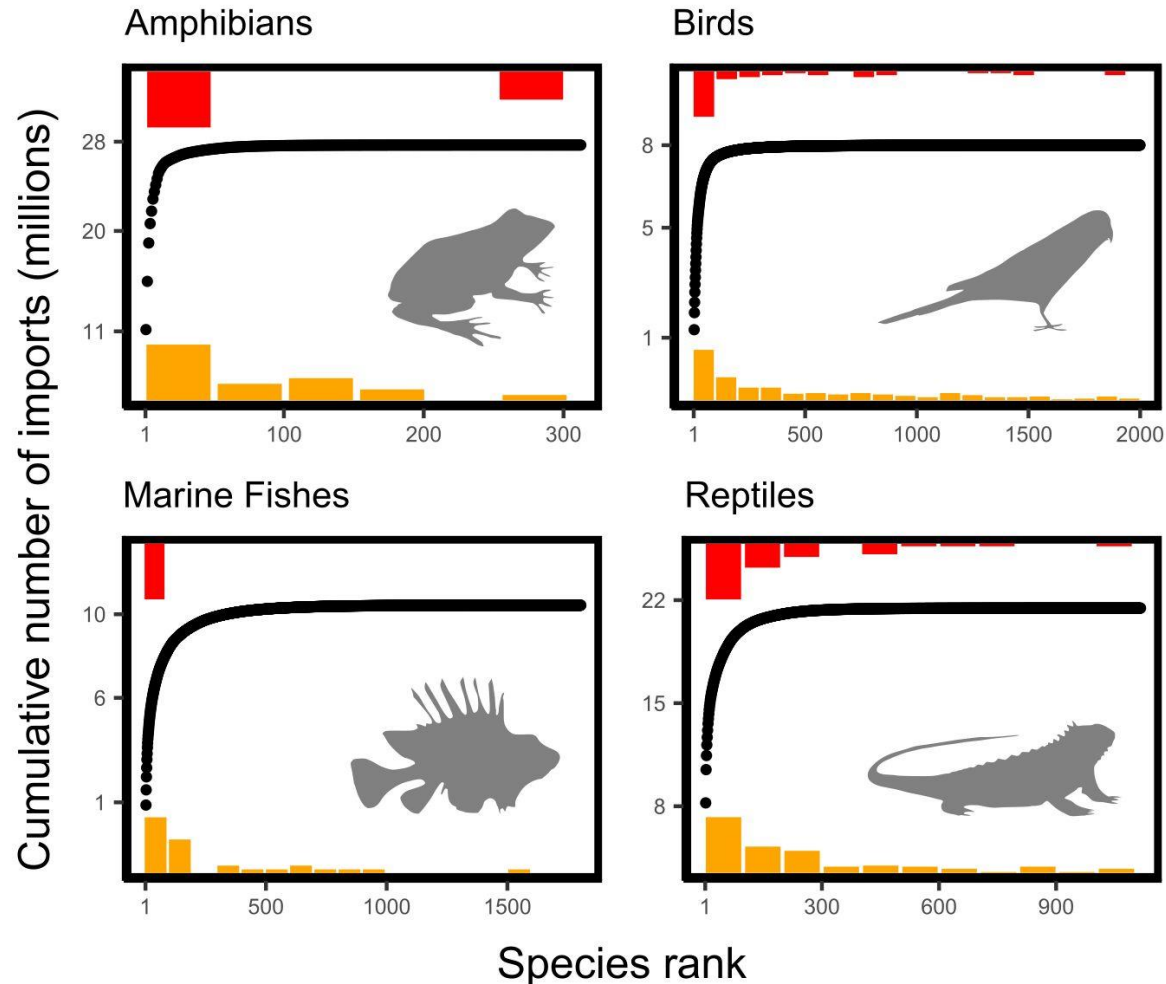
Sinclair *et al.* (2020) *Biological Invasions* 22: 217-231.

Globalisation of trade & transport



Toomes *et al.* (2020) *Wildlife Research* 47: 55-67.

Linking trade, biology and pet owner decisions to the risk of vertebrate invasions in the US



NATIONAL
SOCIO-ENVIRONMENTAL
SYNTHESIS CENTER

Lockwood *et al.* (2020) *Frontiers in Ecology & the Environment* 17: 323-330.

Understanding and intervening in illegal trade in non-native species


e-commerce and open source surveillance

Objectives

- Develop novel and efficient technologies to collect and sift through the vast volume of online trade
- Render it in a form that local practitioners/analysts can use



Webscrapping guide


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A guide to using the Internet to monitor and quantify the wildlife trade

AUTHORS
[Oliver Stringham](#), Adam Toomes, Aurelie M. Kanishka, [Lewis Mitchell](#), Sarah Heinrich, Joshua V. Ross, Phillip Cassey

AUTHOR ASSERTIONS
Conflict of Interest: No ▼




Page: 1 of 45 Automatic Zoom





1

A guide to using the Internet to monitor and quantify the wildlife trade

2

[Download preprint](#) Downloads: 276

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Our framework

Open-source

Systematic

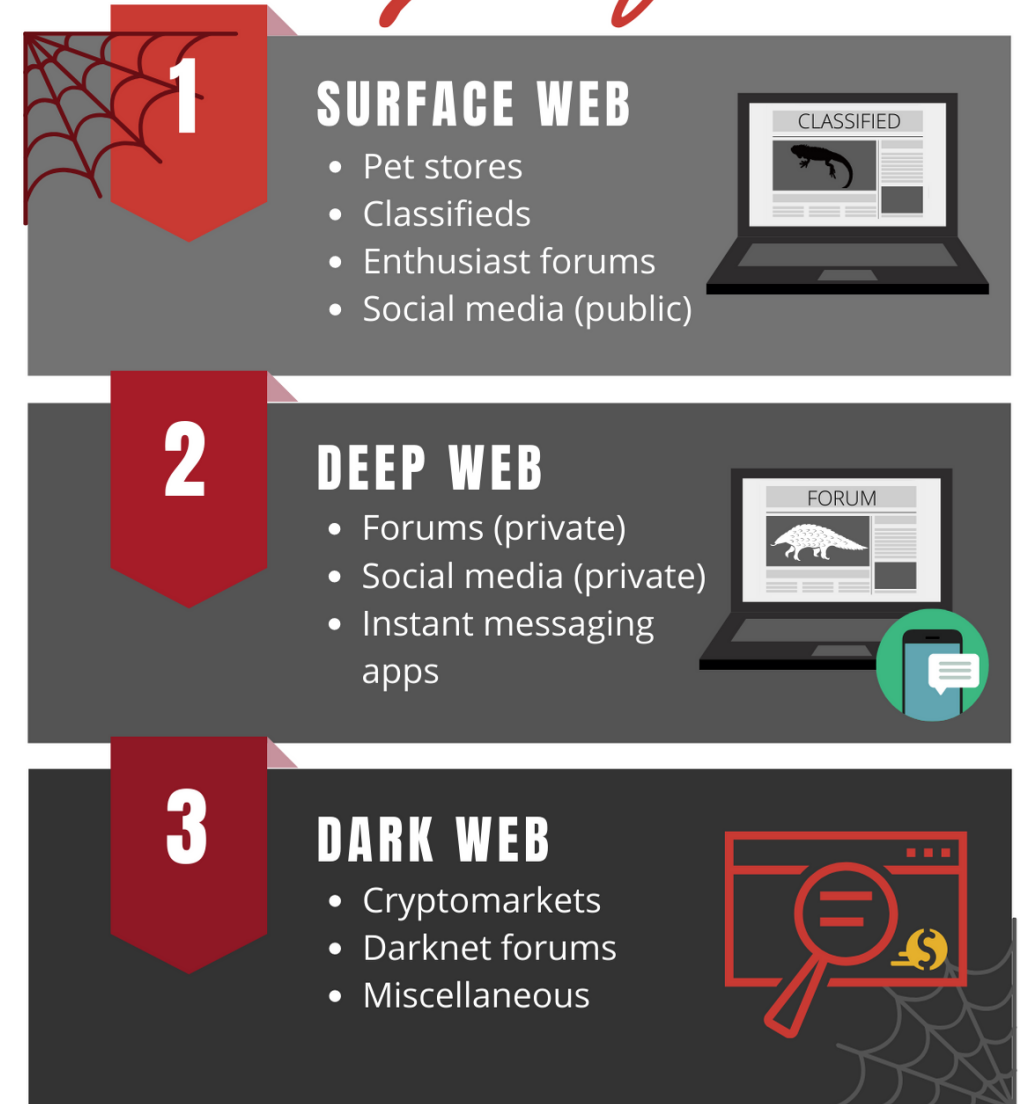
Repeatable

USING THE INTERNET TO MONITOR WILDLIFE TRADE

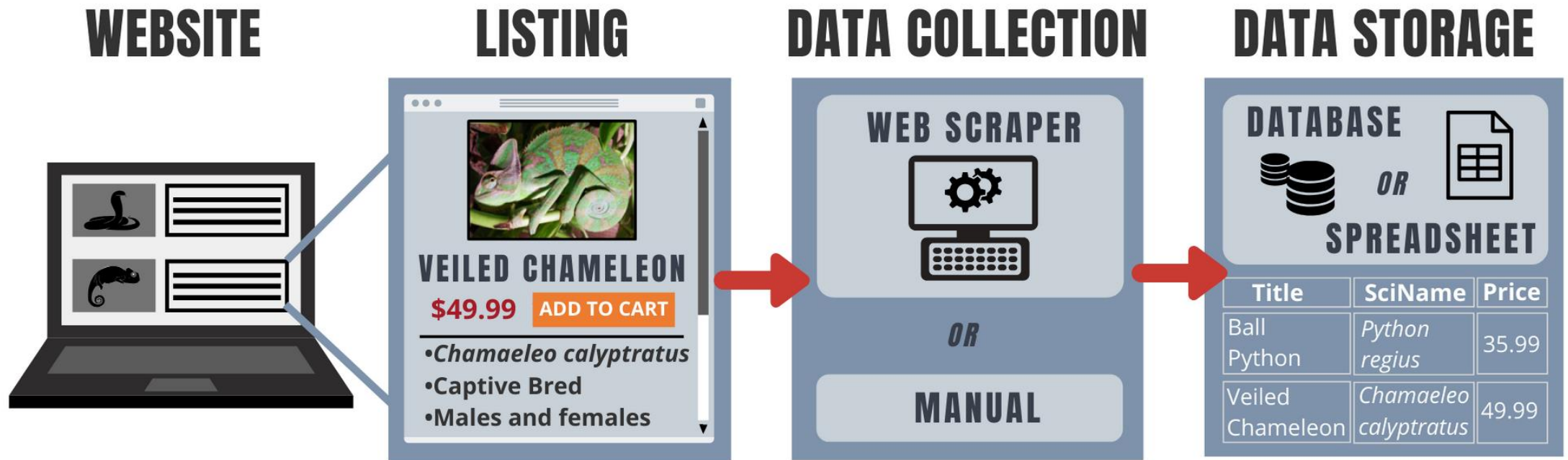


Where does trade occur?

WILDLIFE TRADE ON THE INTERNET *layers of the web*



How to collect data: webscraping



Webscrapping demonstration



Webscrapping: Data cleaning

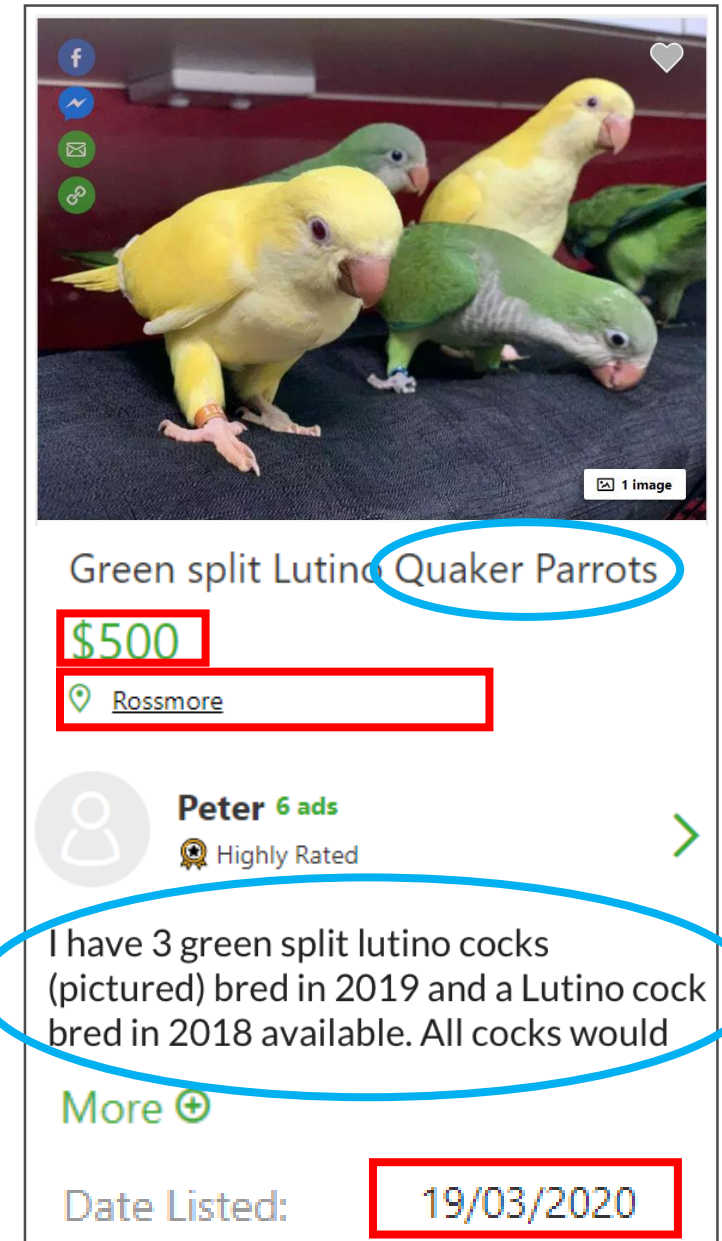
Automatically extract:

- Date
- Location
- Price

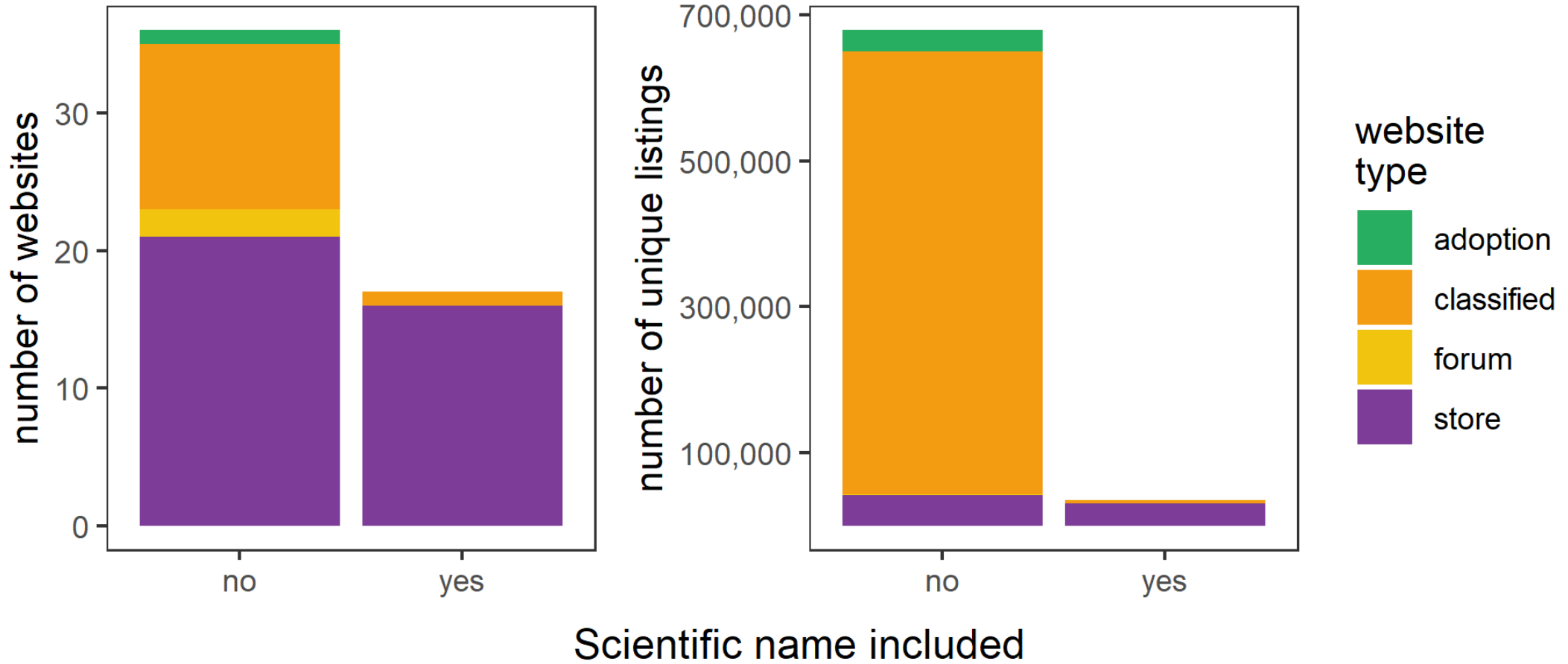


Manually train post-processing to extract:

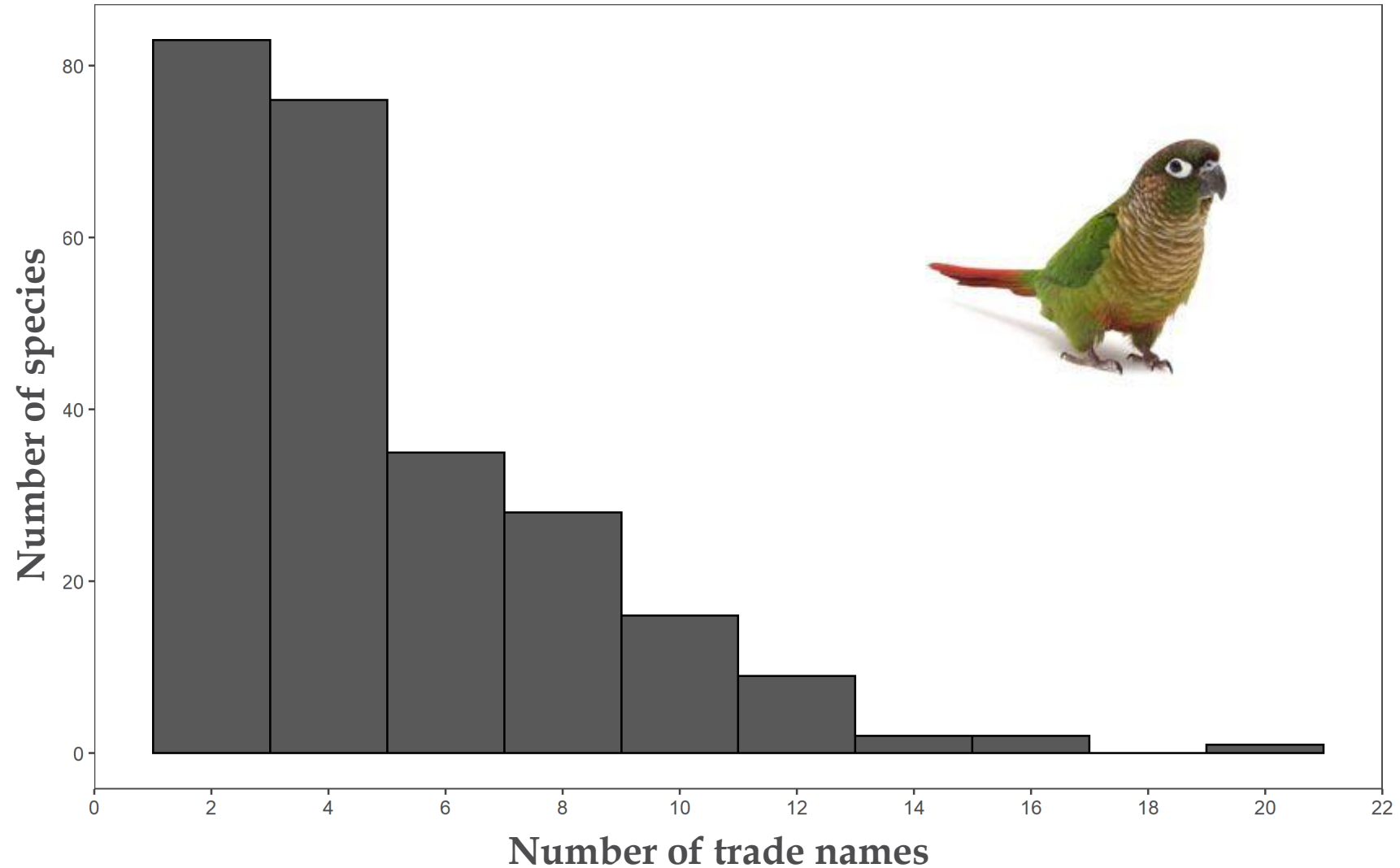
- Species name
- Quantity sold
- Type of advert (wanted or for sale)
- Attributes: such as hand raised



Species names



Species names



Automated data cleaning: machine learning

Remove 'junk' listings → text classification

- Accessories: “*cages*”
- Domestic species: “*pigeons*”, “*chickens*”
- Wanted advertisements

c. 90% accurate

Predict species based on text

- Fuzzy string matching model

In progress

Websites we're monitoring

Gumtree (birds, reptiles, amphibians, fish) 
Gumtree

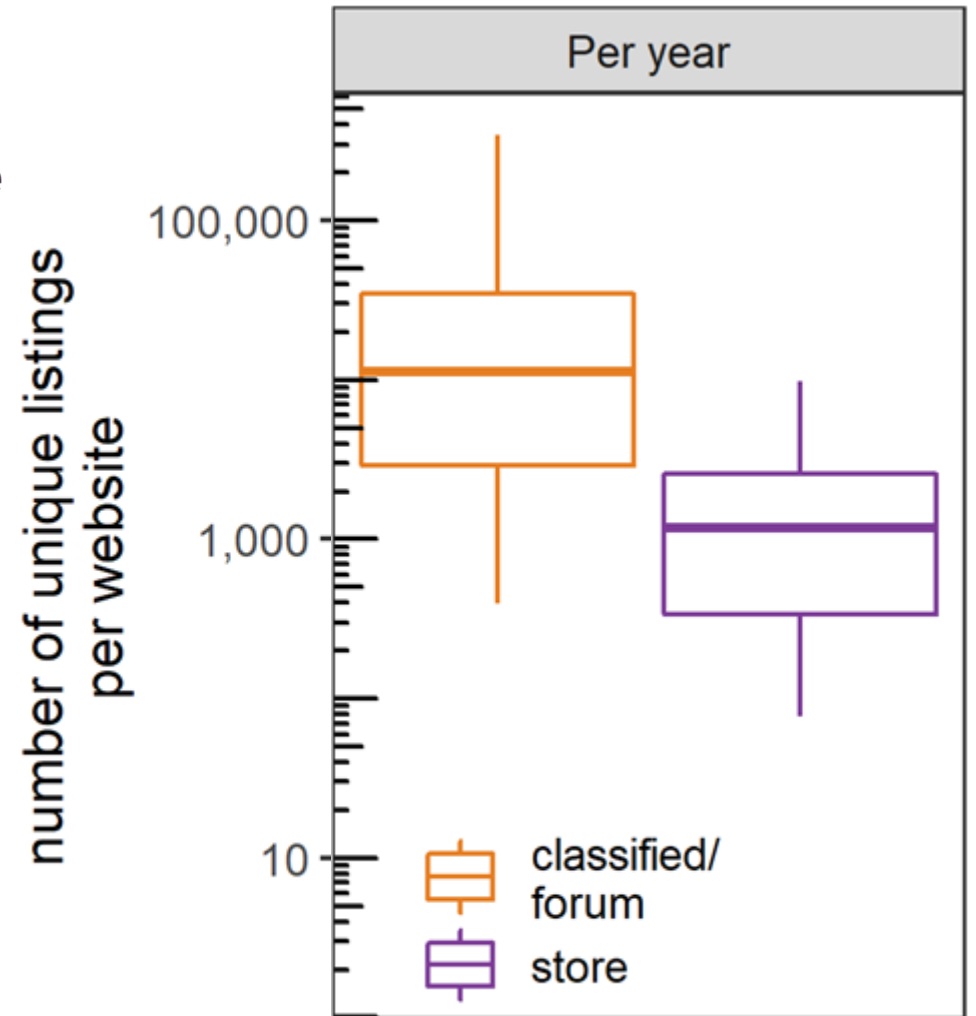
Reptile classifieds and forums

- Reptile classifieds
- Aussie pythons and snakes



Online Pet stores

- Live fish Au
- Kellyville
- Amazing Amazon



Websites we're monitoring

Gumtree (birds, reptiles, amphibians, fish)



Gumtree

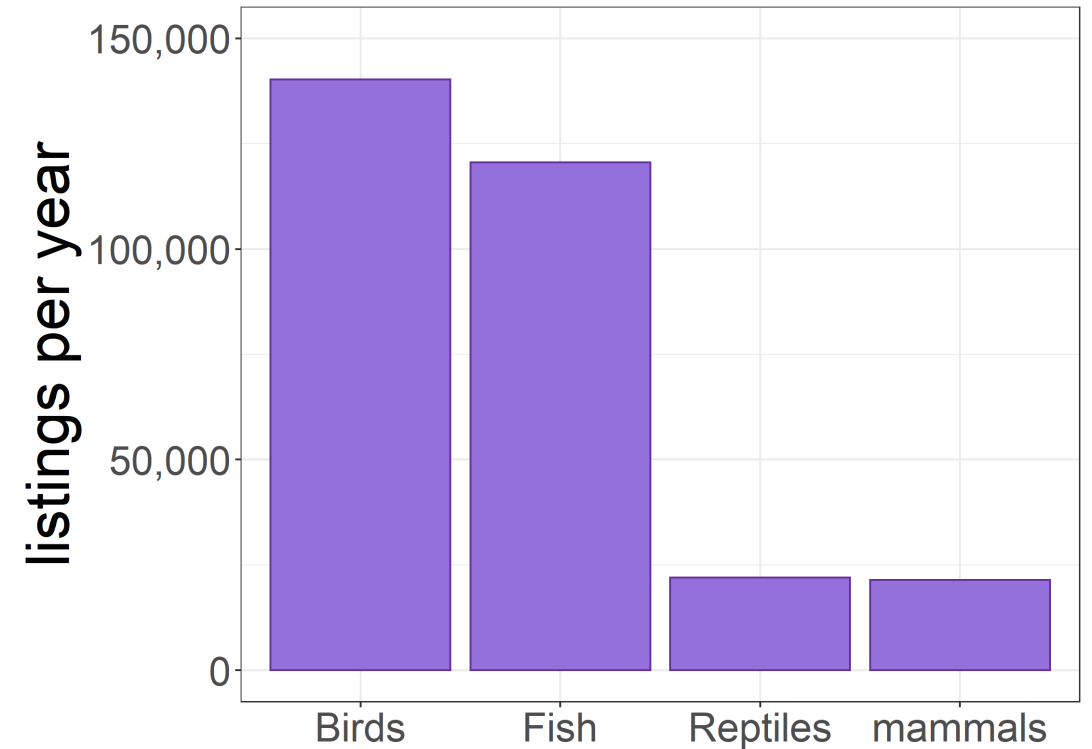
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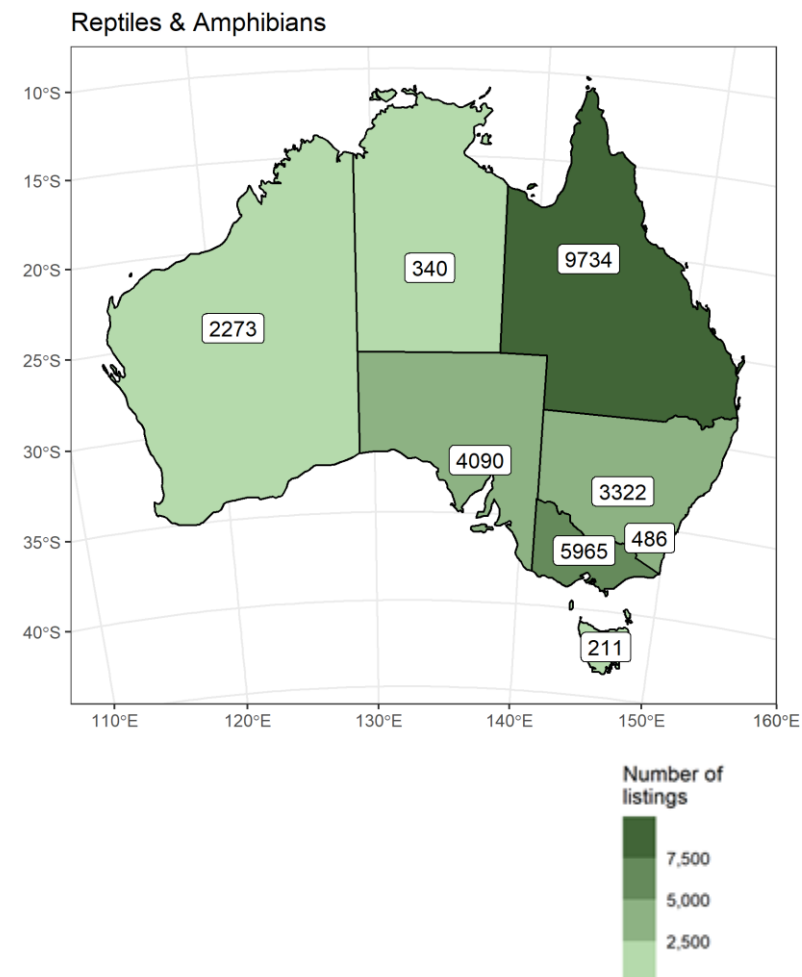
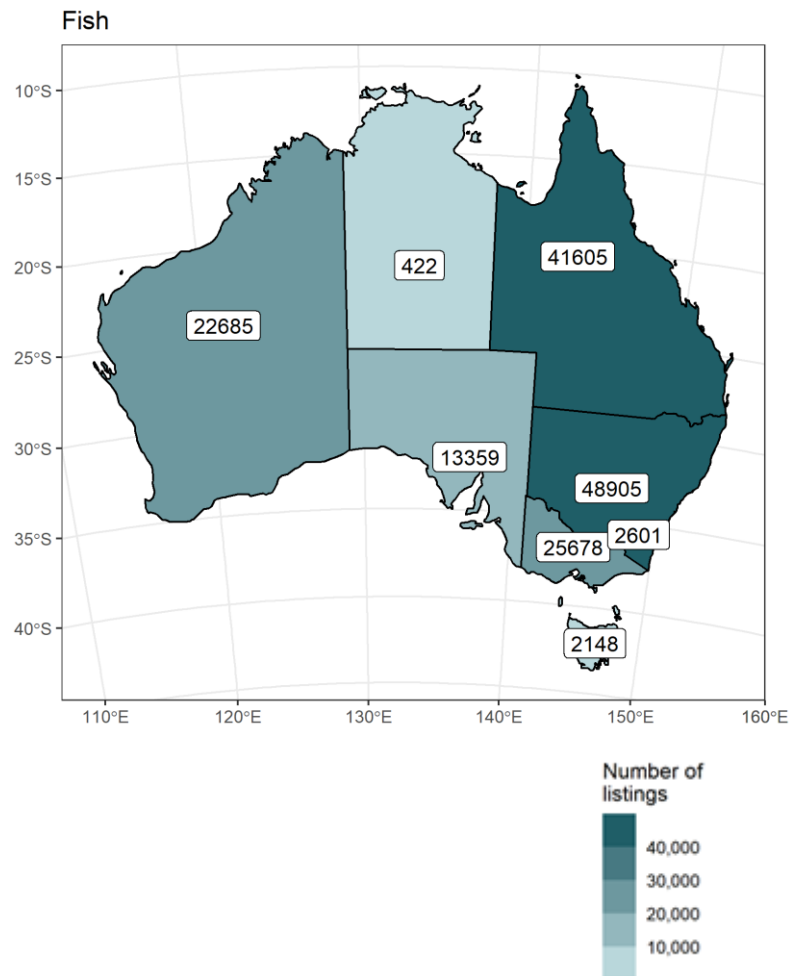
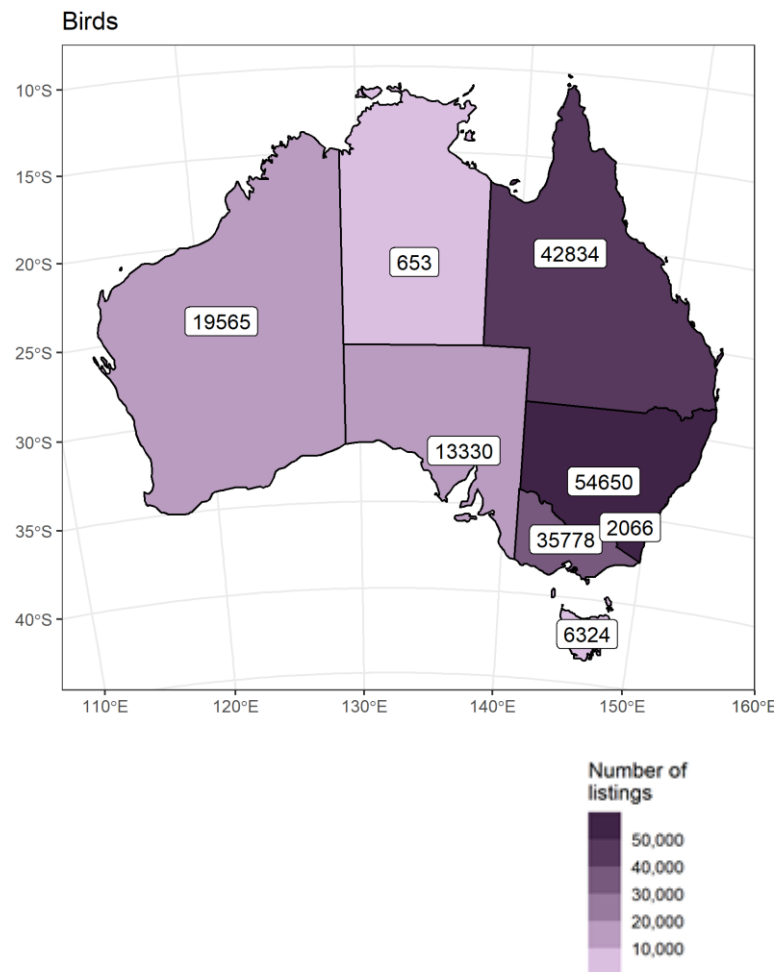


Online Pet stores

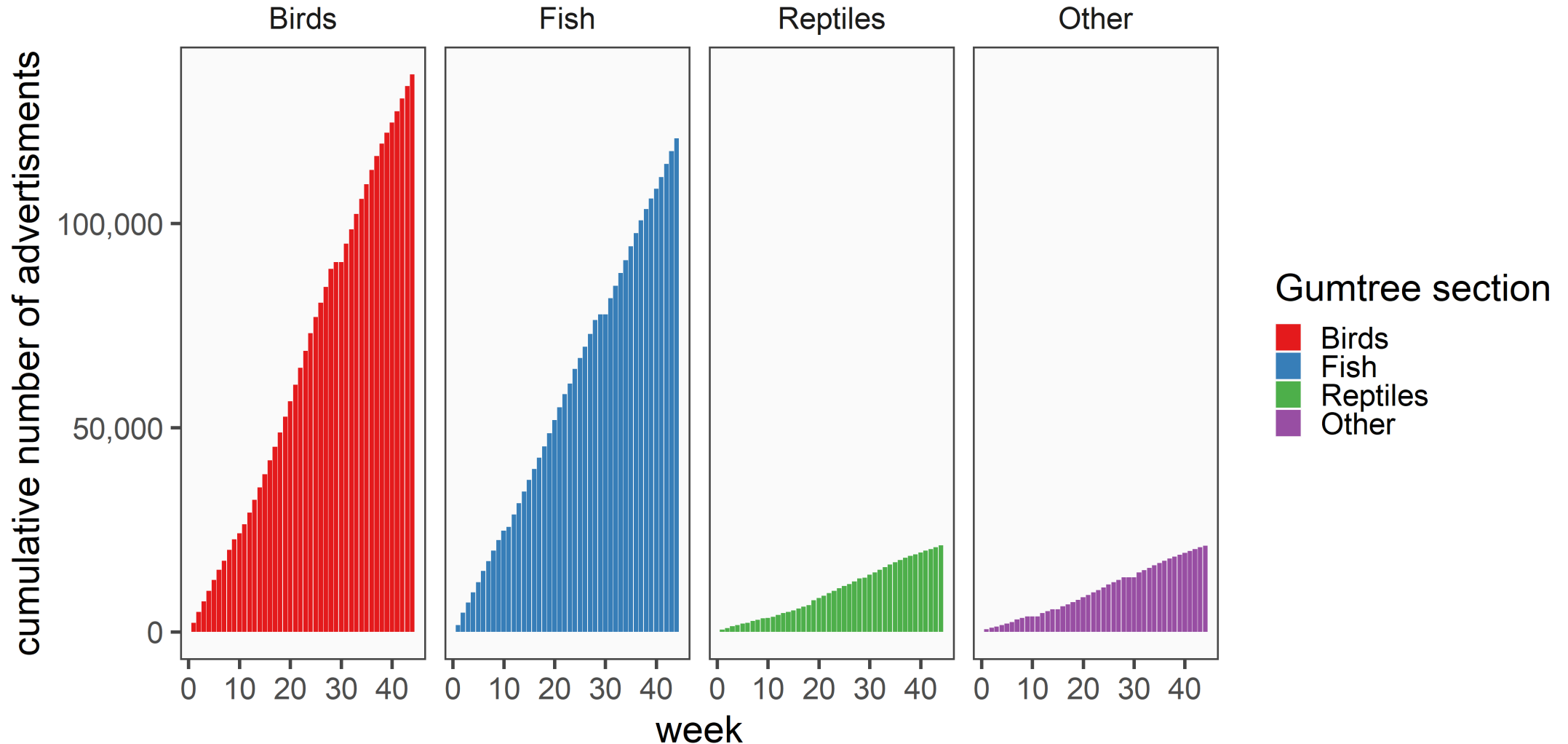
- Live fish Au
- Kellyville
- Amazing Amazon



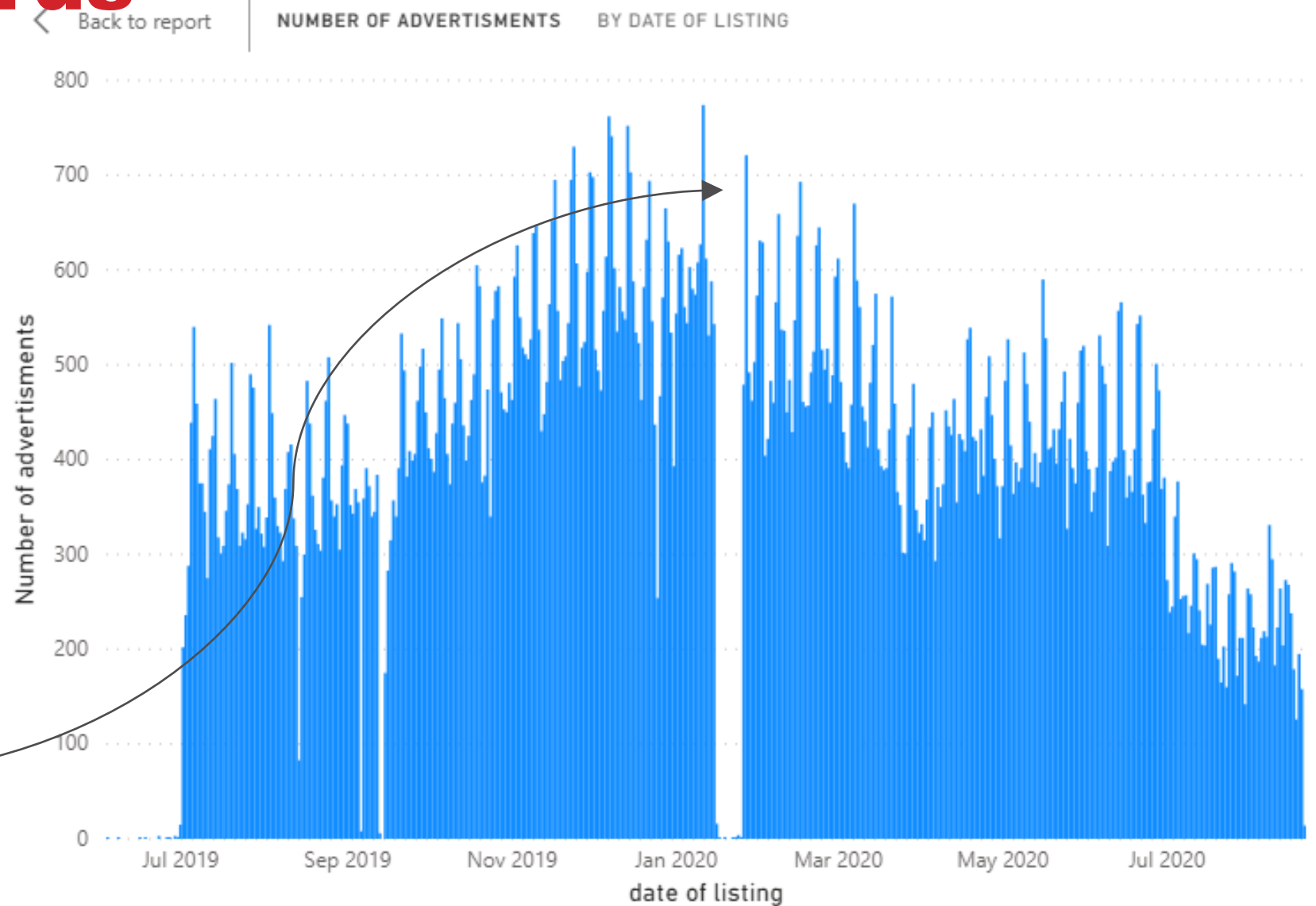
Distribution of advertisements



Gumtree wildlife trade is very active



Gumtree birds



Invasive alien birds



Australian Government
Department of Agriculture,
Water and the Environment

Import risk review for psittacine birds from all countries

Draft report

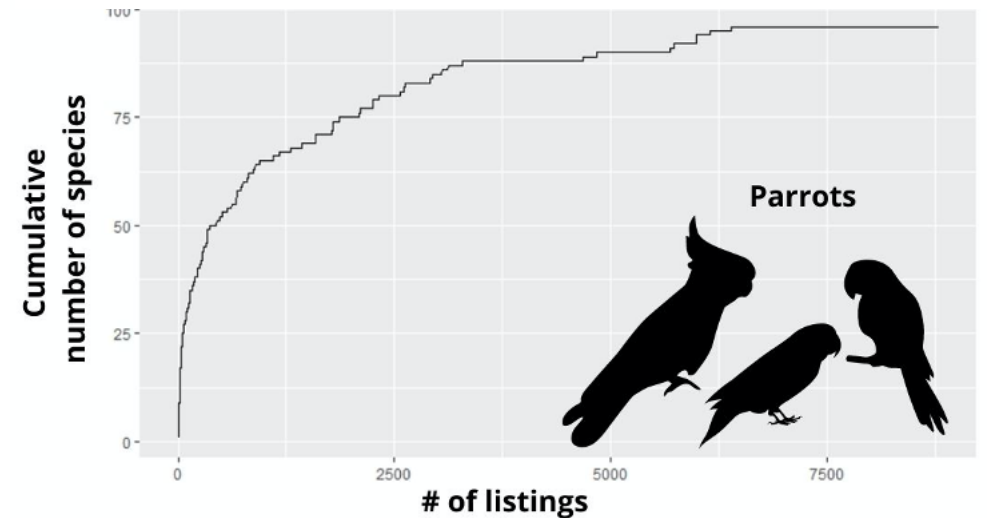
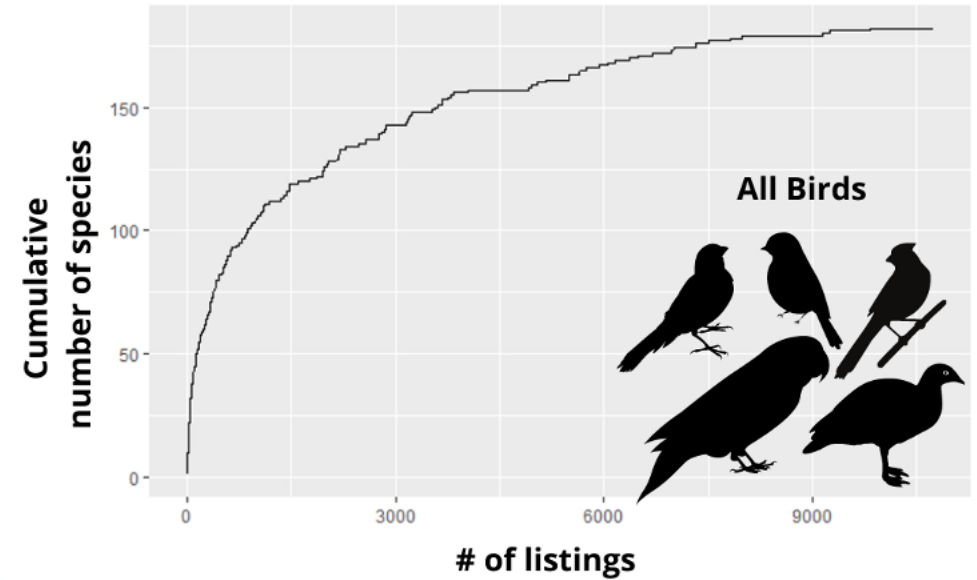
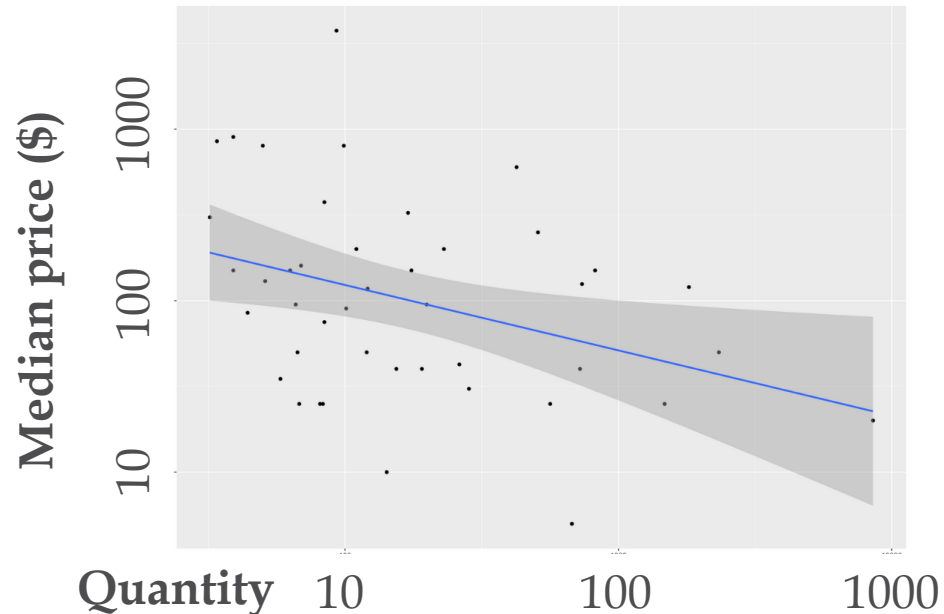
July 2020

This draft risk review takes into account new and relevant scientific information and advice from scientific experts. It proposes that the importation of live household pet and aviary psittacine birds to Australia be permitted, subject to a range of biosecurity risk management measures.

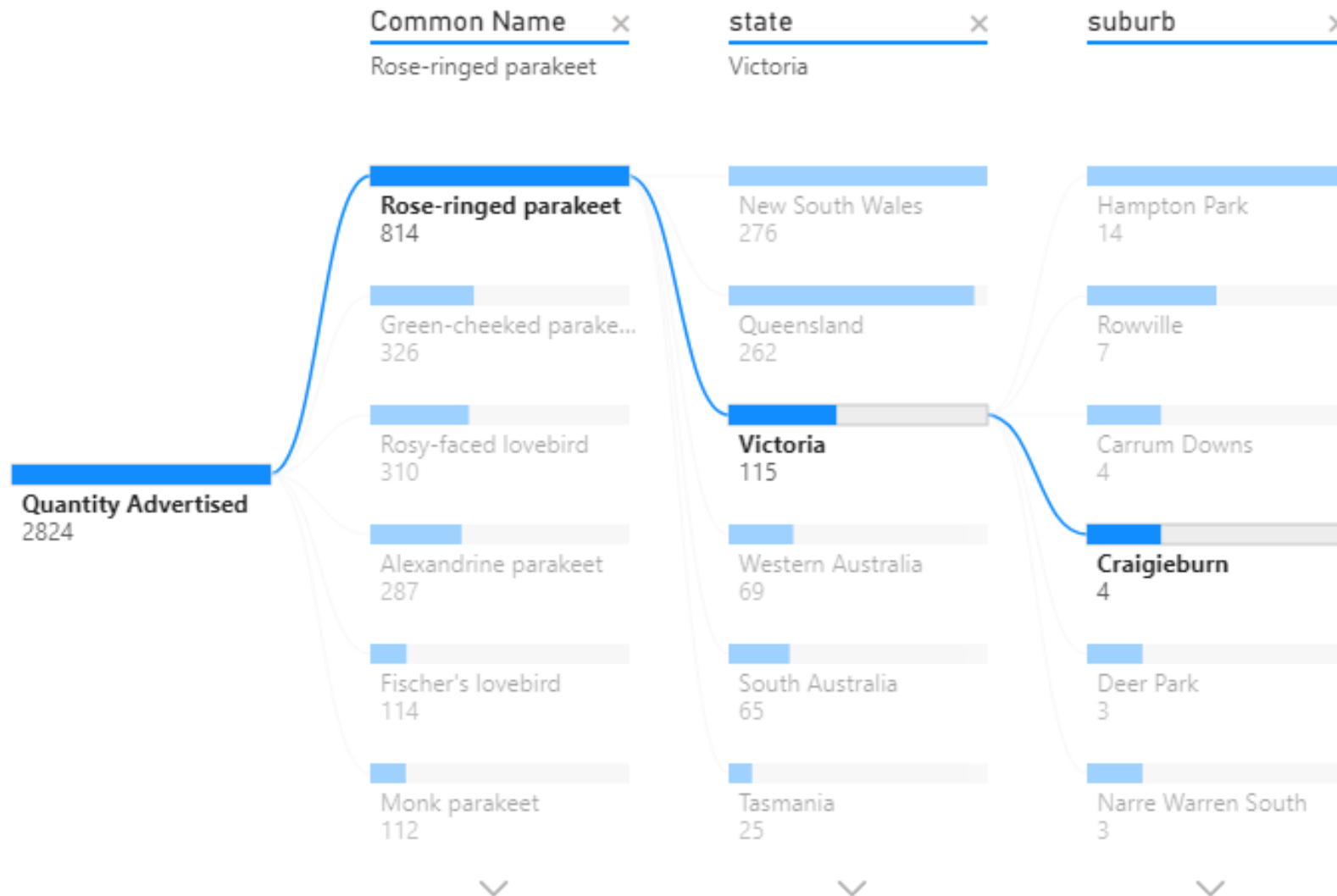
Gumtree Birds

65k unique Gumtree advertisements

- 6-month focal period
- We selected 25% for manual 'cleaning'
- 11k individual birds → 235 species



Online advertisements of exotic birds



Spatial component of online advertisements

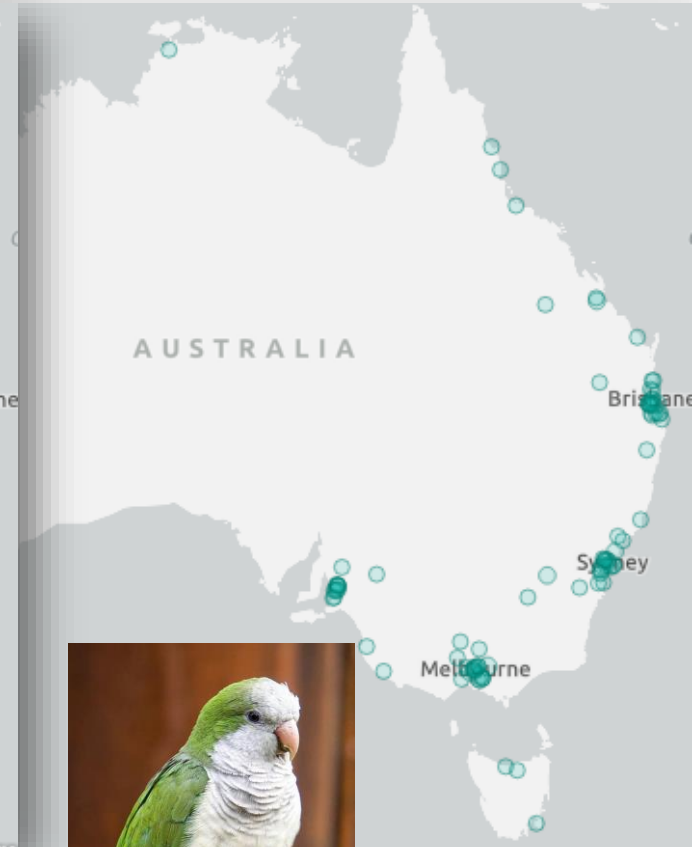
Rose-ringed parakeet



Alexandrine parrot



Monk Parakeet



Detecting Illegal trade

1. Compilation of State/Territory & Commonwealth law
2. Compare advertisements by state for legality

South Australia

Natural Resources Management Act 2004



Western Australia

Biosecurity and Agriculture Management Act 2007



Queensland

Biosecurity Act 2014

**VICTORIAN
LEGISLATION**

Catchment and Land Protection Act 1994

Act in force ACT NUMBER 52/1994 | VERSION 065

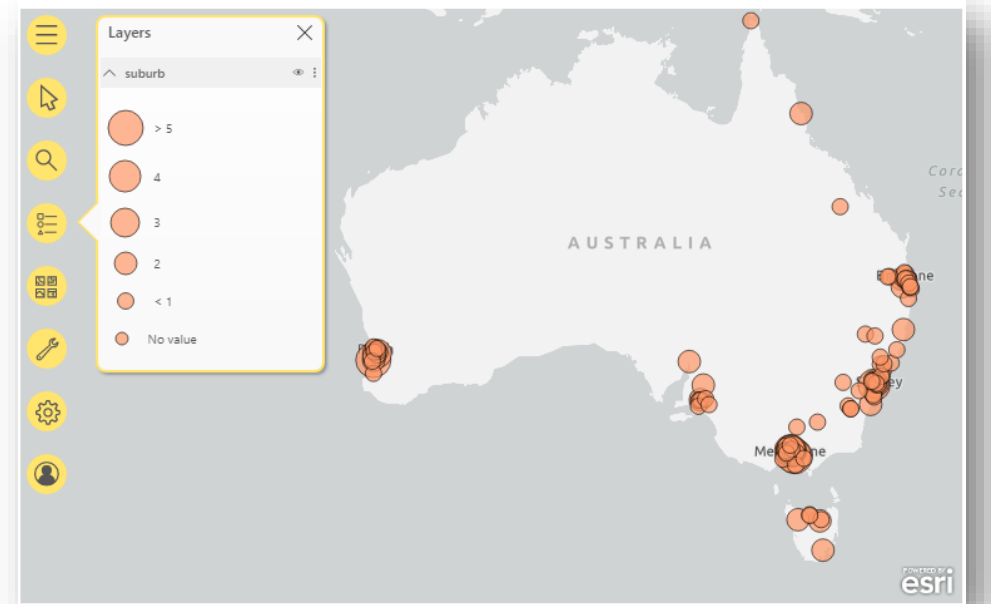
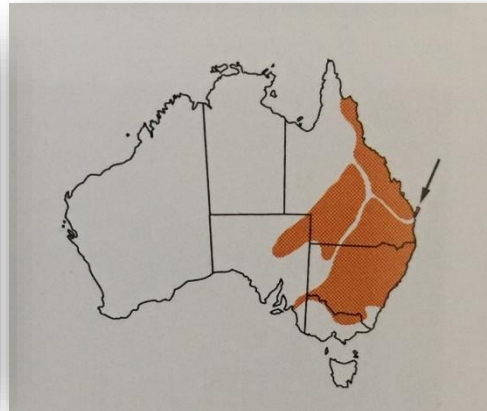


**NORTHERN TERRITORY OF AUSTRALIA
TERRITORY PARKS AND WILDLIFE CONSERVATION ACT 1976**

Domestic non-natives

Novel biosecurity concern?

Many State/Territory laws don't discern domestic non-natives



Biosecurity surveillance of e-commerce and other online platforms for illegal trade in declared plants

Online trade in declared plants

Objectives

- Acquire baseline data on trade quantity and diversity
- Generate set of webscraping standards
- User-friendly interface for data handling and visualisation



Jacob Maher – Research Assistant
commenced August 2020
jacob.maher@adelaide.edu.au

Declared Plants

- Contact made with weeds officers across Australia
- *c.* 1300 declared species and hybrids identified
- Facebook, Gumtree, and eBay major trade platforms
- Interstate trade by online nurseries potential risk



\$5
Prickly pear cactus
Rockingham, WA



\$80
Large ceramic pot with foxtail fern
Port Macquarie, NSW

Stakeholder input and engagement

What is most useful for you?

1. Dashboard system

- Data Summary
- Maps

2. Alert system

- email alerts based on key words

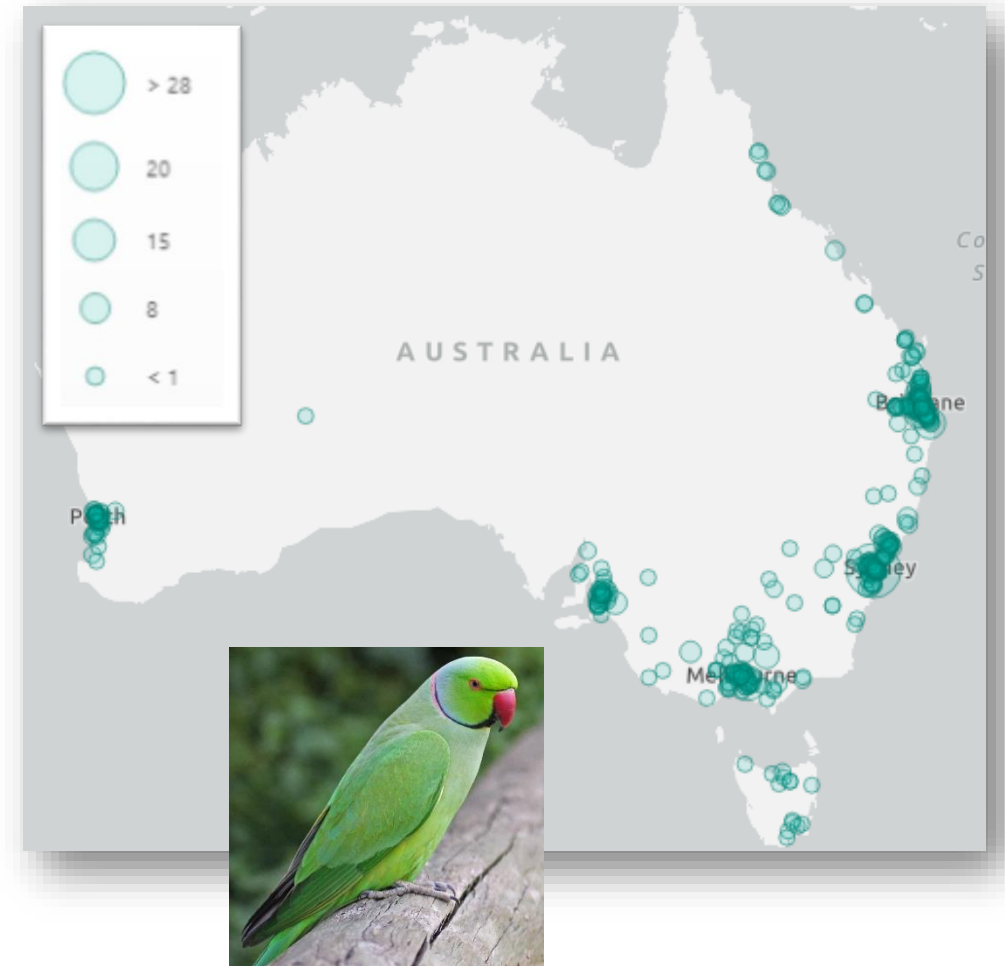


Fri 28/08/2020 11:50 AM

Oliver Stringham

[Gumtree Alert] 01/09/2020 Keyword match "Indian Ringneck" in NSW - 12 Results

To Oliver Stringham



This research is supported by the Centre for Invasive Species Solutions projects (P01-I-002; P01-W-003): *‘Understanding and intervening in illegal trade in non-native species’; ‘Biosecurity surveillance of e-commerce and other online platforms for illegal trade in declared plants’*

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