Integrated passive and active surveillance tools and networks – software & analytics of citizen surveillance data

Peter Caley

9 September 2020

DATA61
www.csiro.au

CENTRE FOR INVASIVE SPECIES SOLUTIONS

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Presentation outline

- What do you want to get out of citizen surveillance data streams?
- Do we actually need a software platform for notifications?
- Is a list approach useful:
  - “alert” lists
  - “safe/permissible” lists
- What should be on the list?
- Where/who should do the analytics?
- How should jurisdictions interact?
- Not talking about
  - Targeted surveillance (Susan Campbell’s WA starling work & Steve Csurhes QLD black-spine toad work)

Citizen observation power is immense – location of FrogId reports from Year 1 only

Birders near Dulkannia Bore (Birdsville Track)

Do you need an automated alert system?

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Ostriches roam the outback after failed attempts to farm the flightless birds

ABC North and West SA By Gary-Jon Lysaght

Updated 2 Sep 2018, 8:50am

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What do you want to achieve w.r.t detections of exotic vertebrate species?

Early warning?

- How early is early enough?
- Better than BAU?

Low cost?

- Highest cost-benefit?

High sensitivity?

- Not many are missed
- What's your tolerance/appetite for risk?

High specificity?

- Few false positives
- The occasional "monkey hunt" may be useful for incursion preparedness?

What approach/system/software will endure?

Citizen science platforms (and their data streams) will continue to come and go …

- E.g. Bowerbird is no more (users encouraged to use iNaturalist)

The Atlas of Living Australia (ALA) is the natural repository to be leveraging from

- Maintenance of data ingestion (often non-trivial)
- Already contains List Tool (http://lists.ala.org.au) which includes pest species such as the NSW State Notifiable Pests and the Global Register of Introduced and Invasive Species
- Recent partnerships with the CISS to support its Weeds Australia work
- Most likely to endure

On lists – what do you want to be notified about?

Safe/Permissible (formerly “white”) lists?

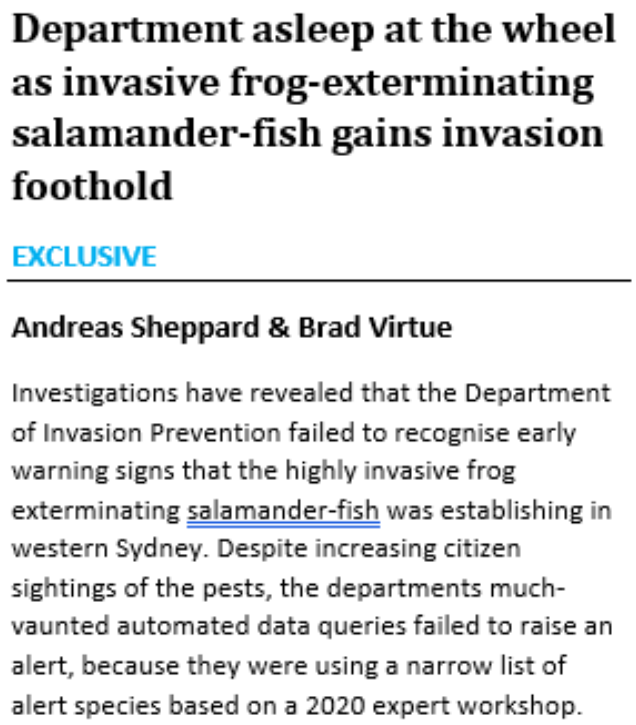
- Known endemics (reptiles, amphibians, mammals of OZ – not too hard c.f. insects)
- Anything not on list will raise alert

Alert (formerly “black”) lists?

- Known invasive species
- Known invasive species + suspected (modelled)
- Remember that predicting invasiveness is hard
- All exotic species?

Risk of alert system failure?

- Invader not on the Alert List
- Incorrect user-supplied name
- Alternative user-supplied name



Department asleep at the wheel as invasive frog-exterminating salamander-fish gains invasion foothold

EXCLUSIVE

Andreas Sheppard & Brad Virtue

Investigations have revealed that the Department of Invasion Prevention failed to recognise early warning signs that the highly invasive frog exterminating salamander-fish was establishing in western Sydney. Despite increasing citizen sightings of the pests, the departments much-vaunted automated data queries failed to raise an alert, because they were using a narrow list of alert species based on a 2020 expert workshop.

Self naturalisations do happen – which ones should we stop?

Cattle egret colonisation example

- 1940s in Australia
- 1960s in New Zealand
- Abundant in pastoral (disturbed) habitats, but not generally regarded as “invasive”
- Could/should we have acted if we had early detection system in place?
- Can we distinguish between “self-naturalisations” and undesirable “invasions”? Do you want to try?

Source: http://www.australianbushbirds.info/infa/ardea_ibis.html

2007 Canada geese incursion (self introduced)

Canada Goose, Musk Duck, Little Eagle
Killalea State Park, Shellharbour
The four Canada Geese were still present at the lagoon in Killalea state park on Sunday arvo. They were hanging out on the grass on the south side of the water. Also 4 Musk Duck out on the water and a Swamp Harrier and Little Eagle overhead.

Iain Blake 10/3 #31078

Photo: Ian Blake via Eremaea Birdlines

Eremaea Birdlines
Interesting and unusual bird observations

Home About Login Enquiry

Recent Sightings > Selection > Archive

Birdline New South Wales

Archive

March 2008

Successfully eradicated

Some recent exotic vagrants – nice to know (and see), or something to worry about?

Species	Jurisdiction
Kentish Plover	Queensland
Laughing gull	Queensland
South Island Oystercatcher	New South Wales
Citrine Wagtail (Gray-backed)	Northern Territory
Manx Shearwater	Western Australia
Collared Imperial-Pigeon	Queensland
Gurney's Eagle	Queensland
Oriental honey-buzzard	Western Australia

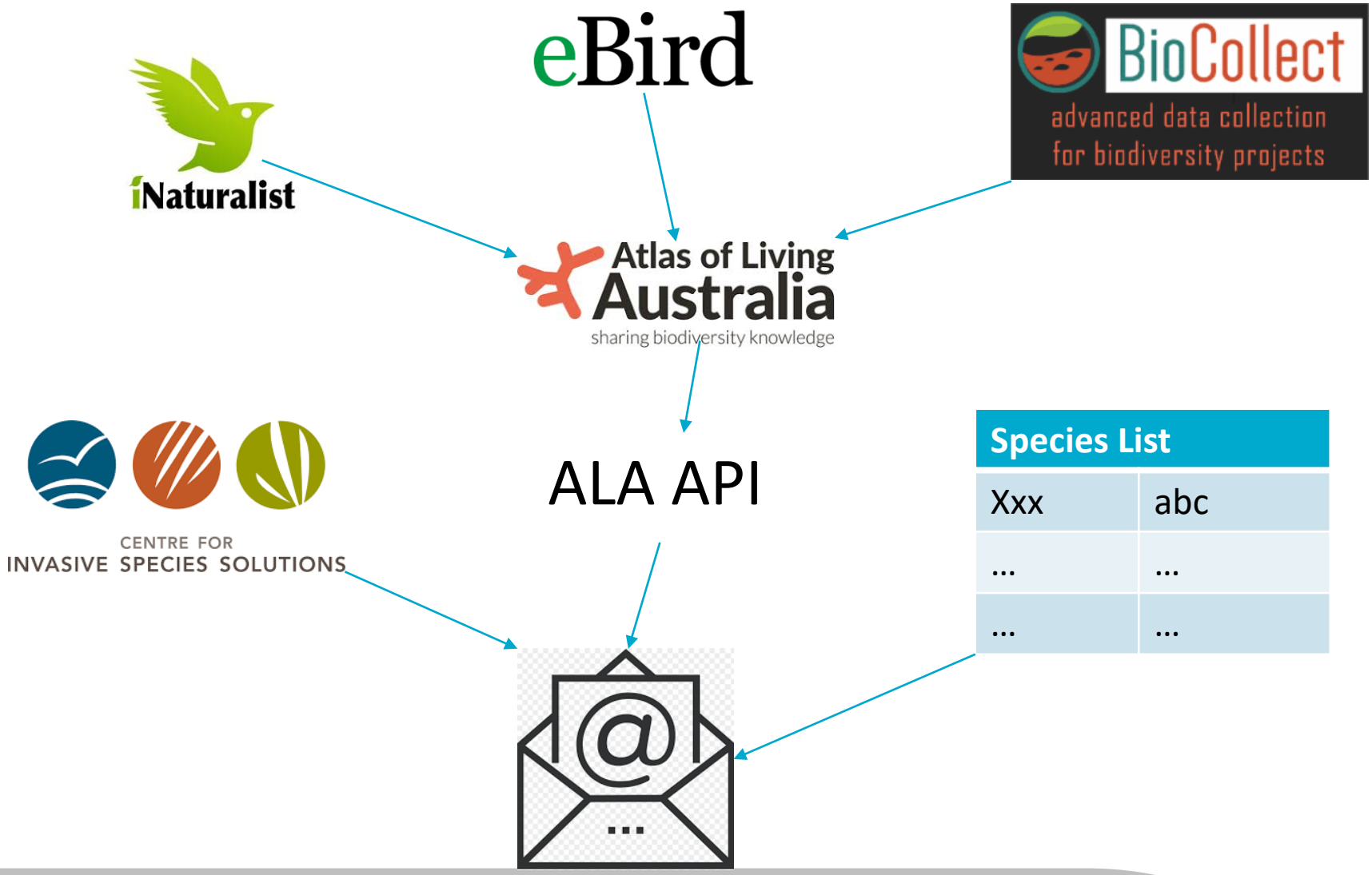
Source: ebird-alert@cornell.edu

Workflow of ALA/DAWE – inhouse processing

ALA checks new species against DAWE Species List

Alert email generated

Workflow of ALA/CISS – external processing



Format of alerts?

Frequency of alerts?

- Bi-weekly (current frequency of upload of iNaturalist to the ALA)?
- Weekly?
- Monthly?
- Yearly?

Criteria for alerts

- Single record alone?
- Evidence of establishment (e.g. space-time clustering in species detections)?

Sharing amongst jurisdictions?

- Pooled vs. tailored “Alert Lists”?

Preserving privacy

- Obtaining additional sighting information may be hard

Wrap-up – questions posed

- What do you want the analytics of citizen data streams to achieve?
- What type of approach do you want (e.g. “Alert” vs. “Permissible” lists)?
- At what point in the data stream do you want to undertake analytics (e.g. base provider vs. ALA)?
- Who does the analytics?
- How do the jurisdictions want to interact (e.g. shared “Alert” lists)

Thank you

Peter Caley

t +61 2 6216 7063
e peter.caley@csiro.au