



Introduction to the Leftovers Initiative:

Identifying Gaps in Invasion Ecology

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Overview

The Leftovers Initiative

Knowledge Gaps

Closing the Gap

Discussion & Takeaways



The *Leftovers Initiative*

- 2-year project to fill knowledge gaps for 54* species in state of Florida
- Initial investigation is on terrestrial vertebrates that are common (<100 observations on EDDmaps)
- Growing concern of increasing spillover of species from Florida to new populations



*Final number is not finalized, and much analysis is still ongoing

Species

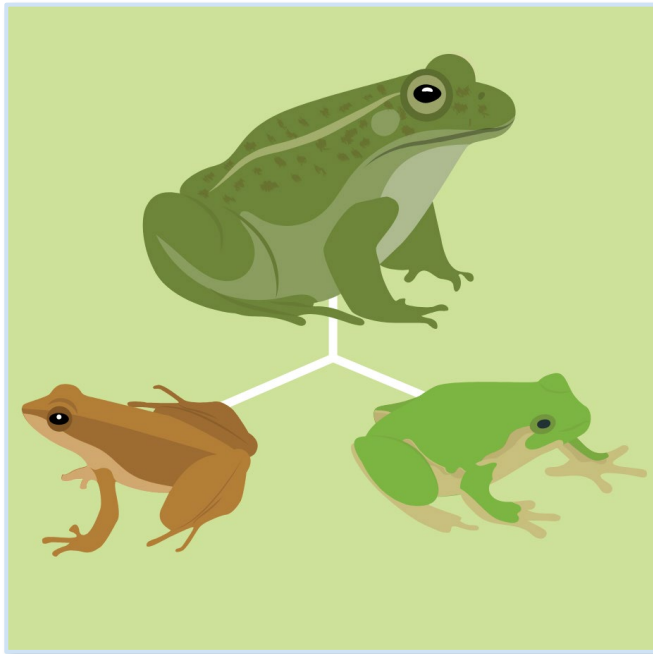


54 'understudied' species
across a variety of sizes,
taxonomy and establishment
stages

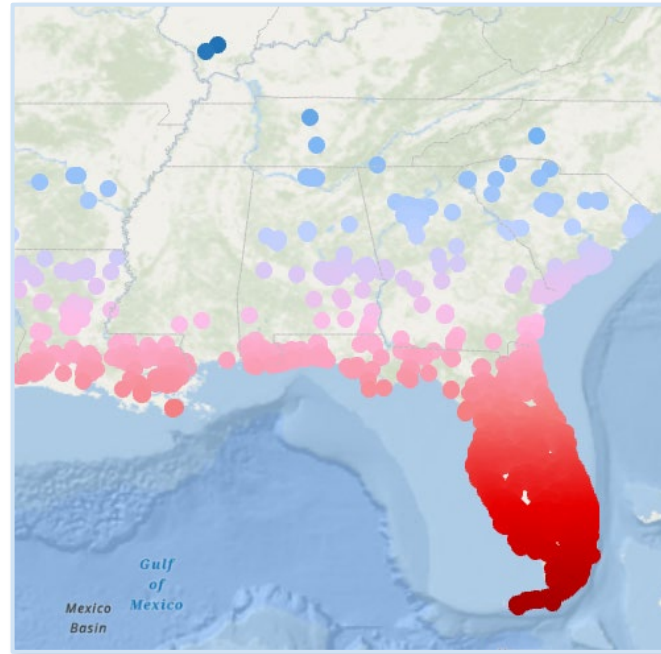


What we *THINK* we know

Taxonomy



Distribution

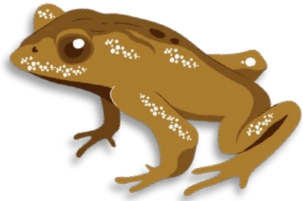


Impacts

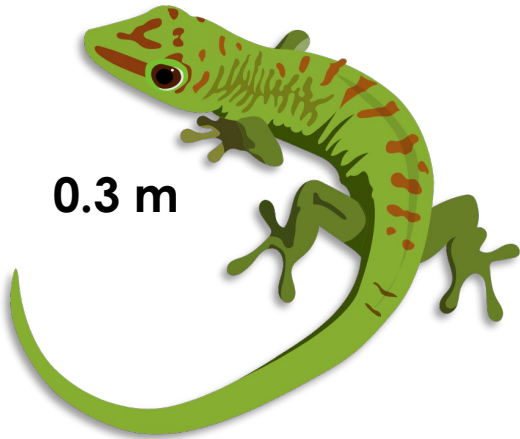


A *Big* Little Problem

0.06 m



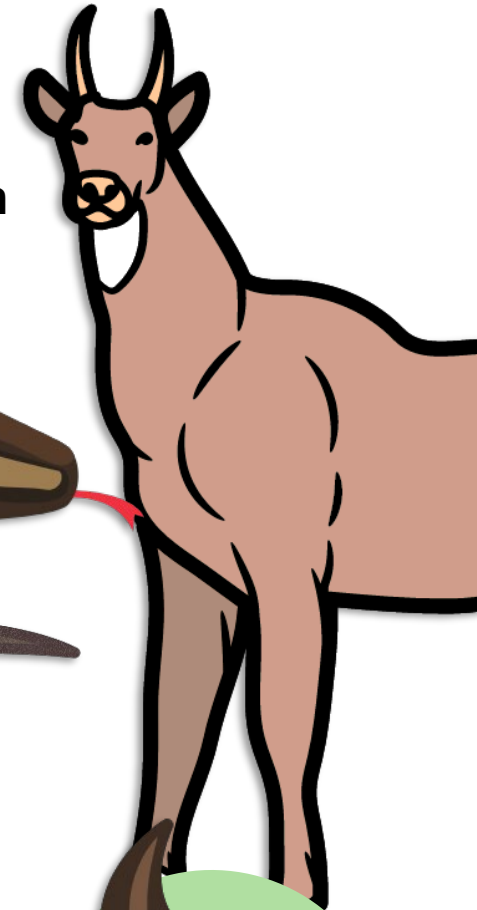
0.3 m



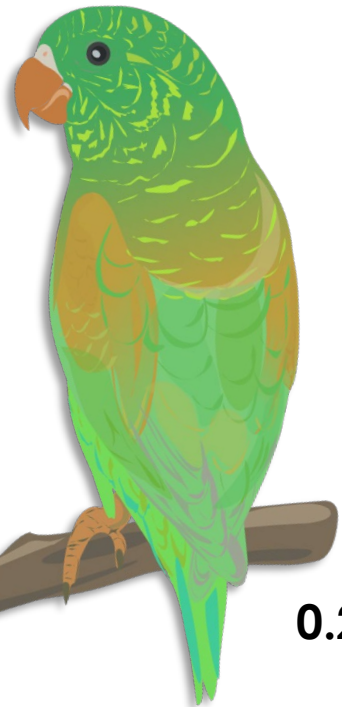
0.6 m



1.5 m



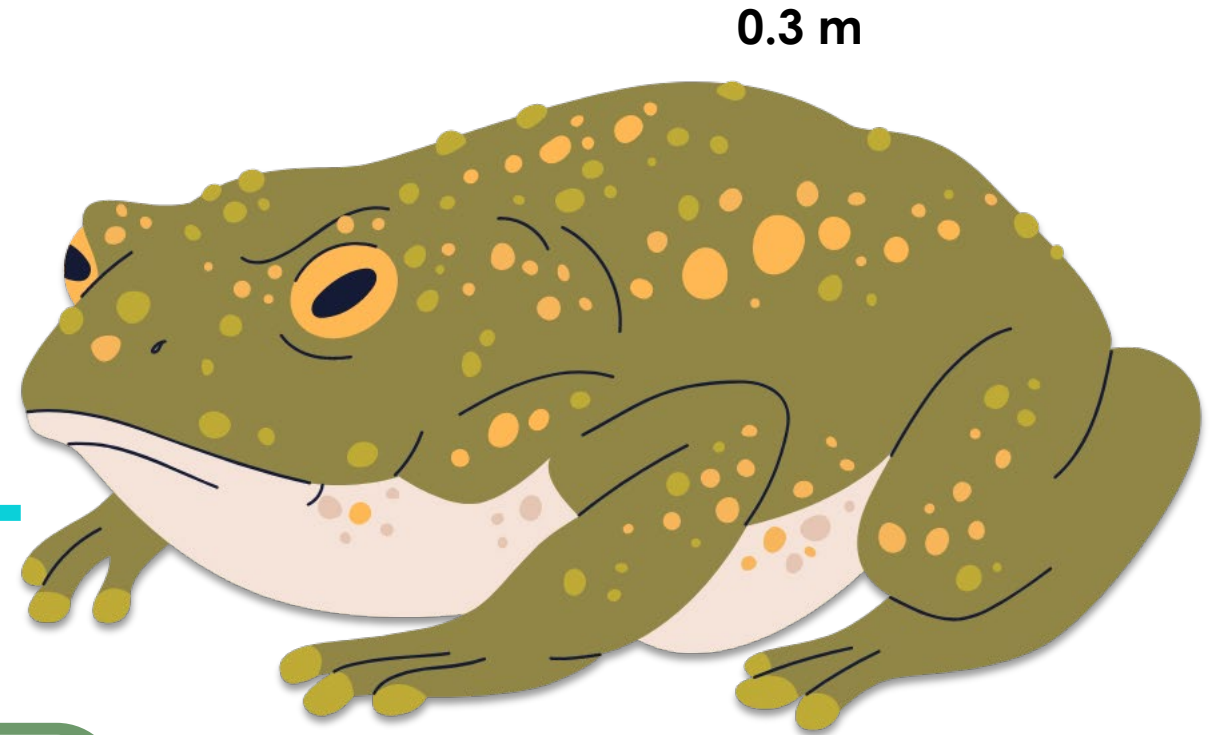
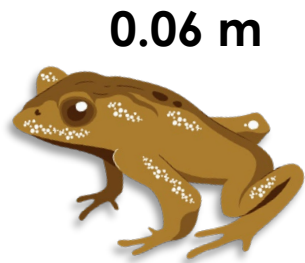
3.2 m



0.2 m

Often size can correlate how much knowledge publish on a species

Scale is Important



Size of species can aid in observations and as a possibility to garner more attention for funding*

*This is dependent on taxonomic groups and local ecology

Perception is Important

Native Fauna Like



Non-charismatic Fauna

Charismatic Fauna



Bibliometric Analysis:
Identifying Knowledge Gaps





Peaks & Valleys

- Records of published literature in WOS* (Earliest Record-2023)
- Records were sorted by keywords (journal and AI generated)
- Occurrence of keywords were sorted into 6 categories
- Categories followed common species profiling

Testing our assumptions of what we know draws research attention

of Articles



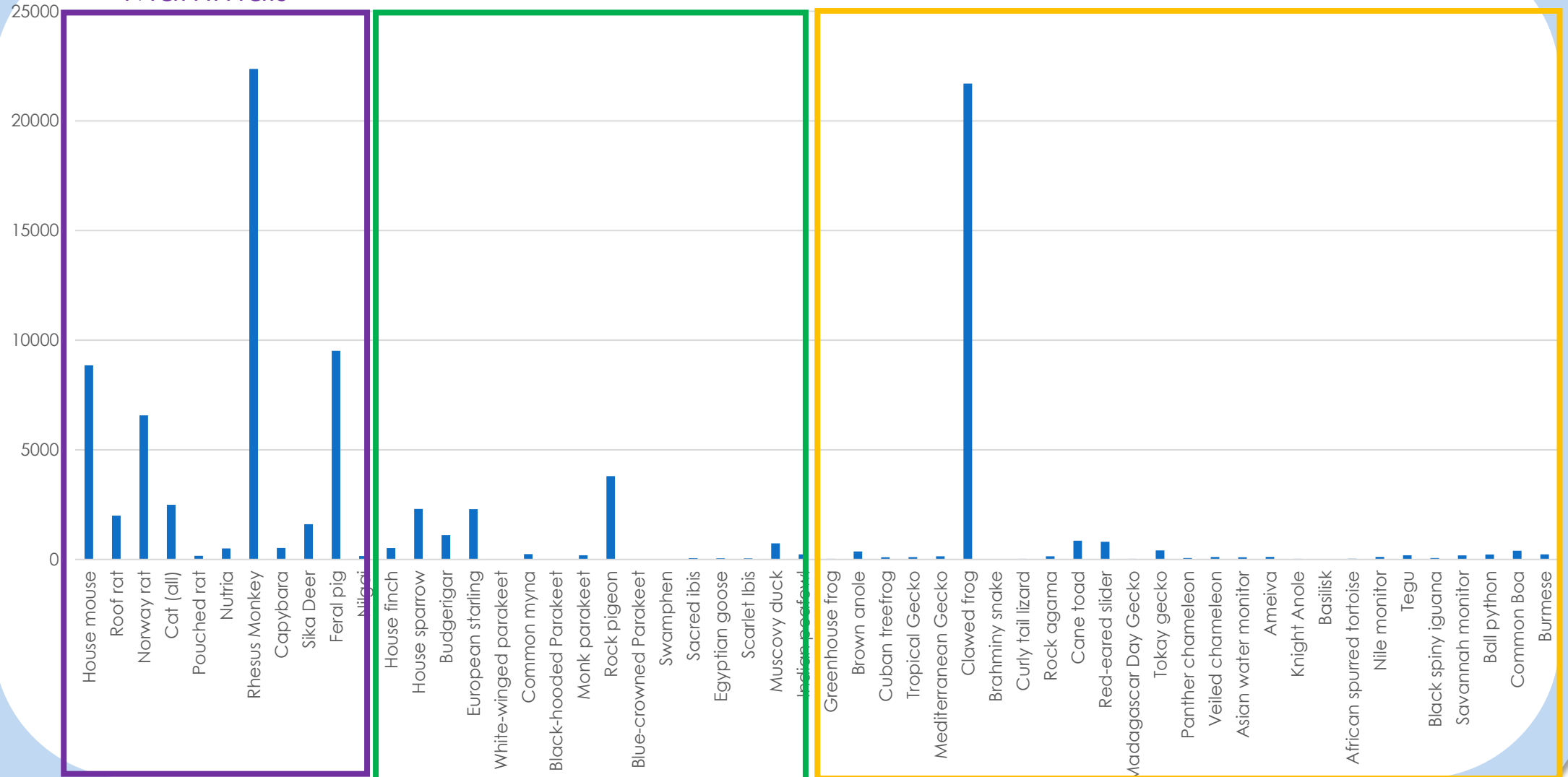
Three colored boxes (purple, green, yellow) with red question marks inside, positioned below the bar chart.

Mammals

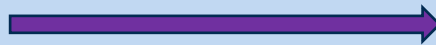
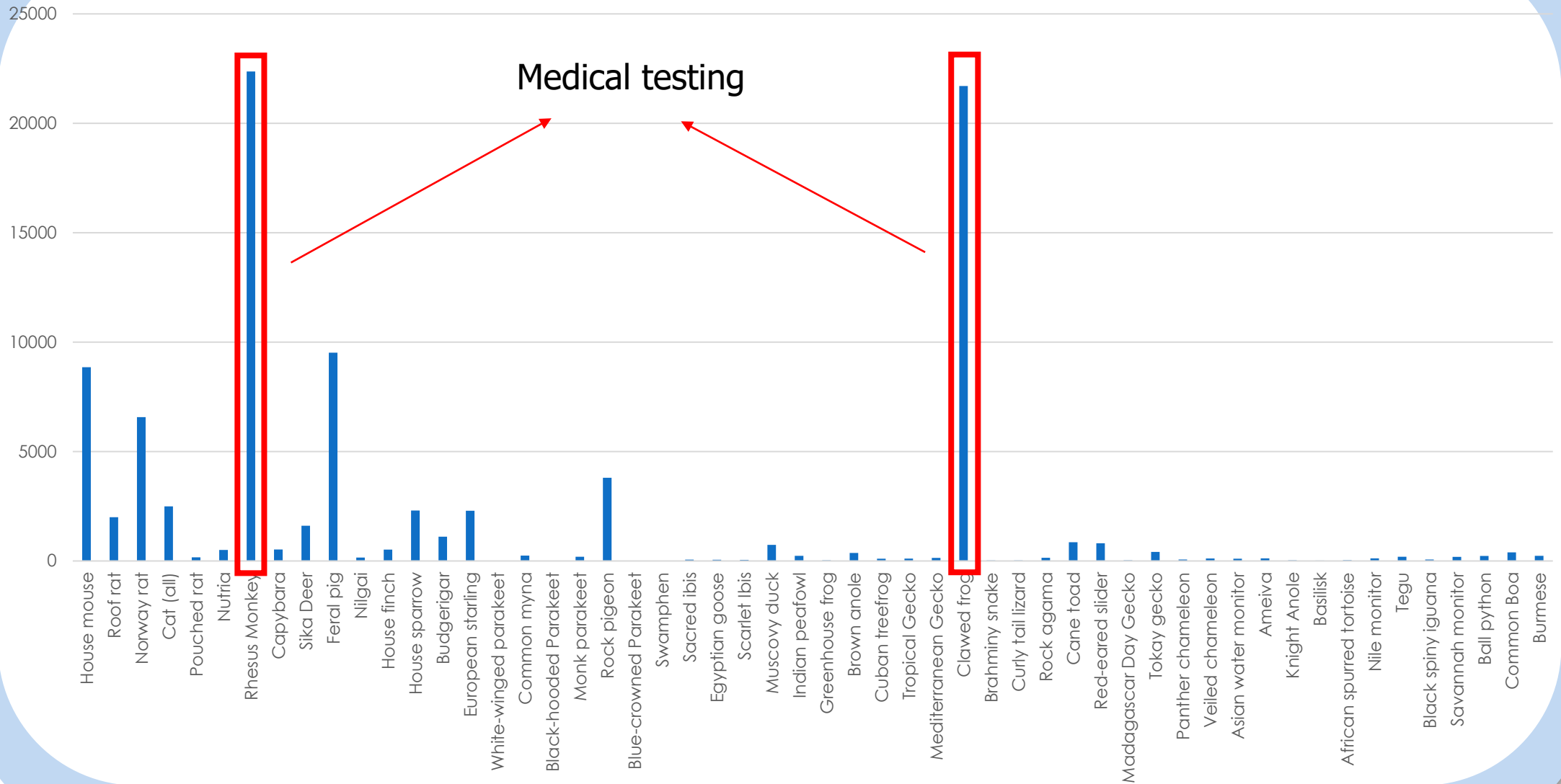
Avians

of Articles

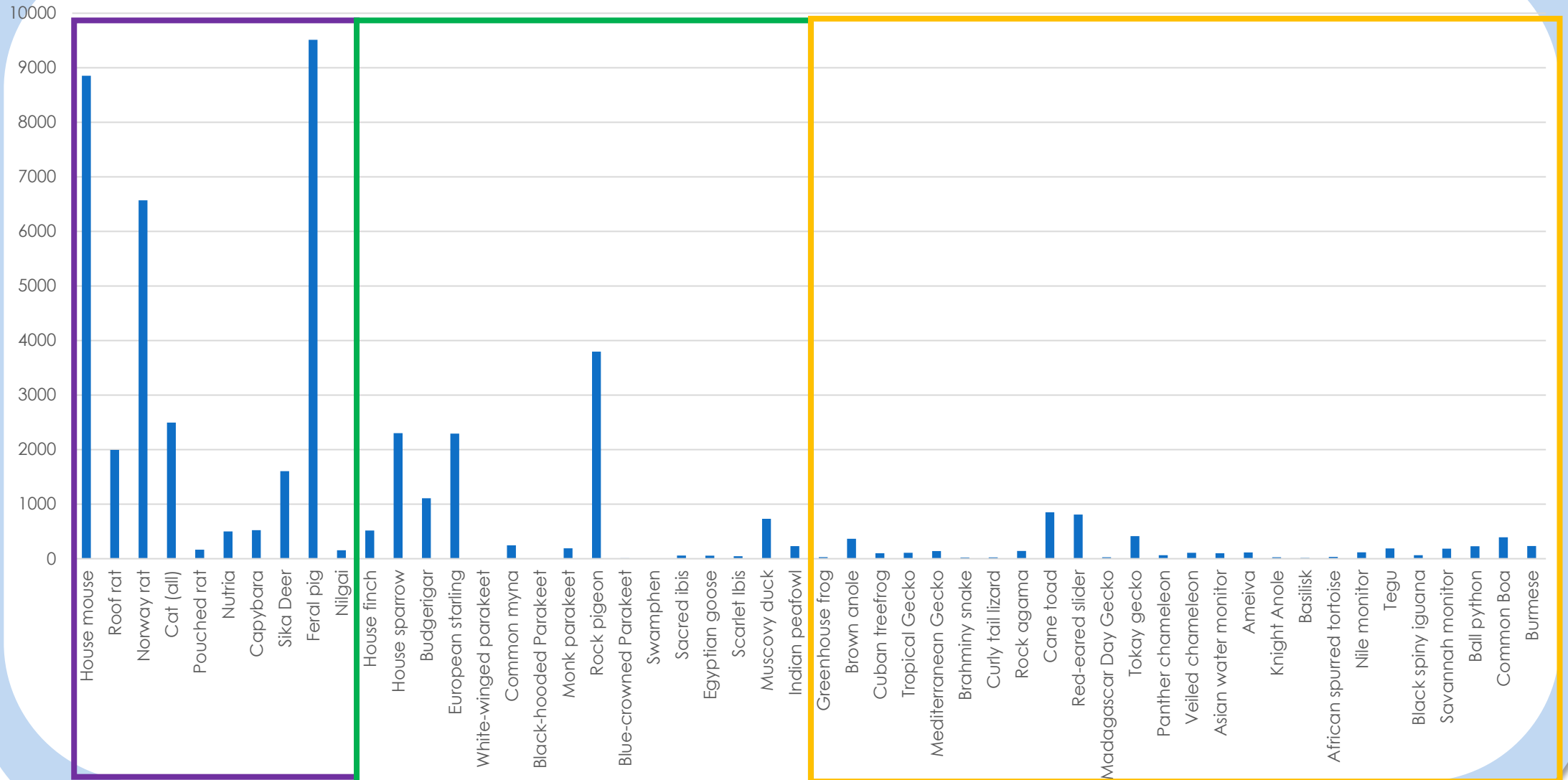
Herpetofauna



of Articles

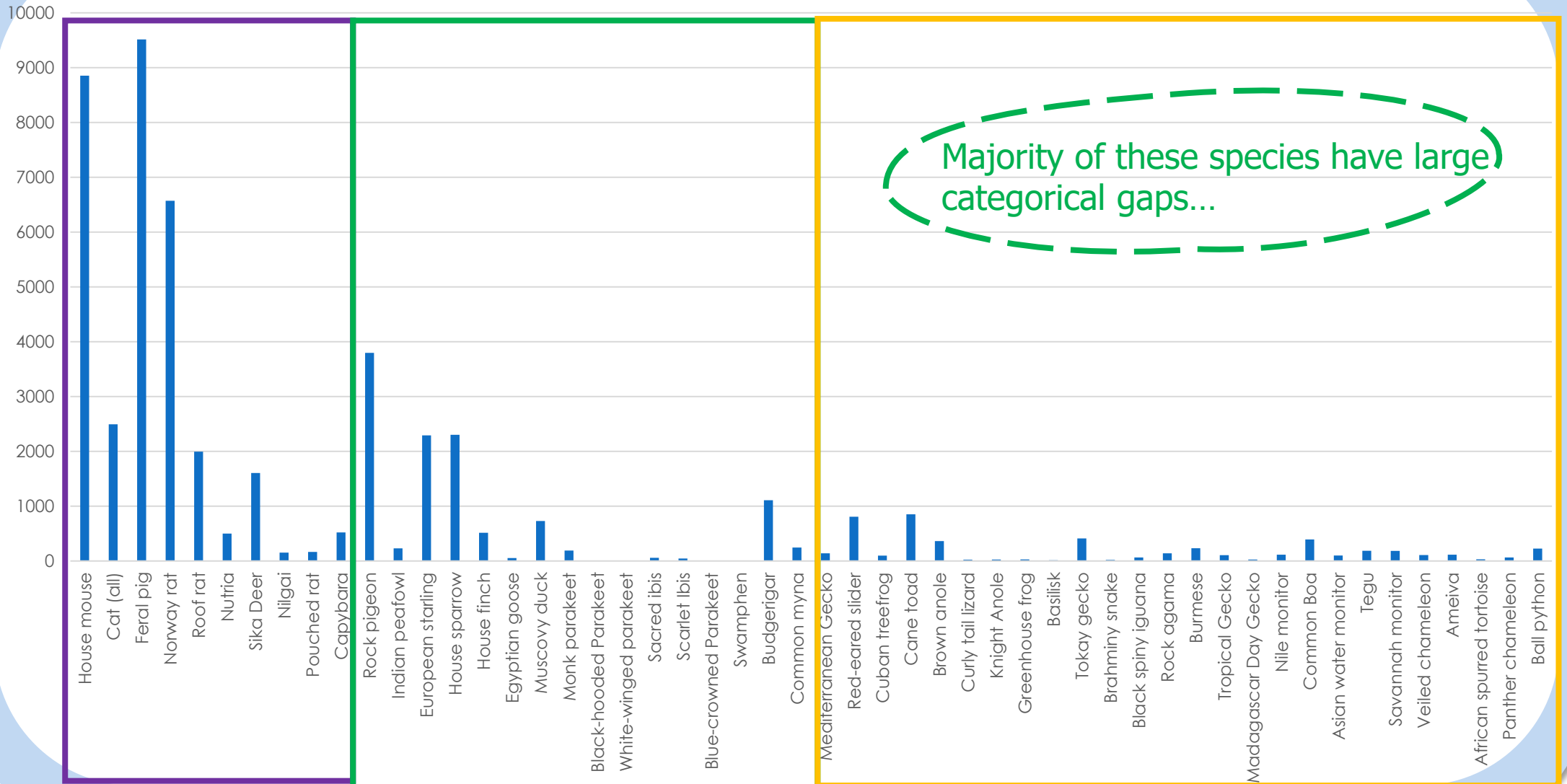


of Articles



Increasing in size by taxa

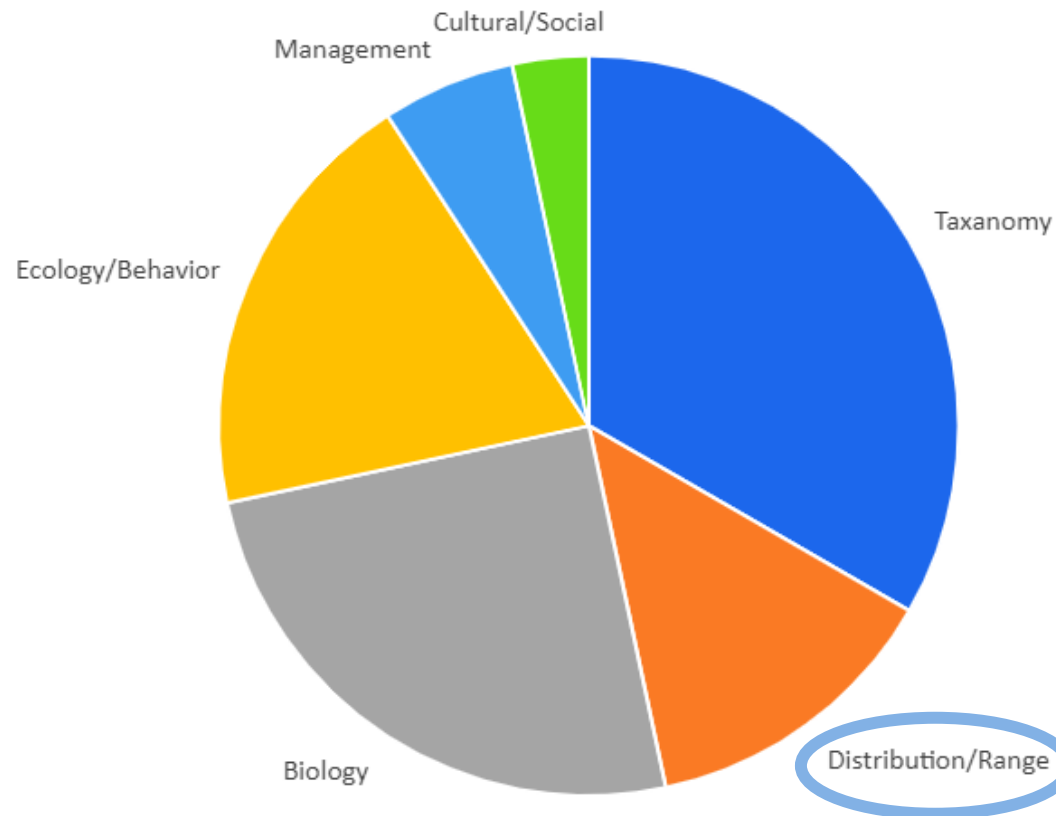
of Articles



Majority of these species have large categorical gaps...

From earliest to most recent reported sightings

What we **ACTUALLY** know

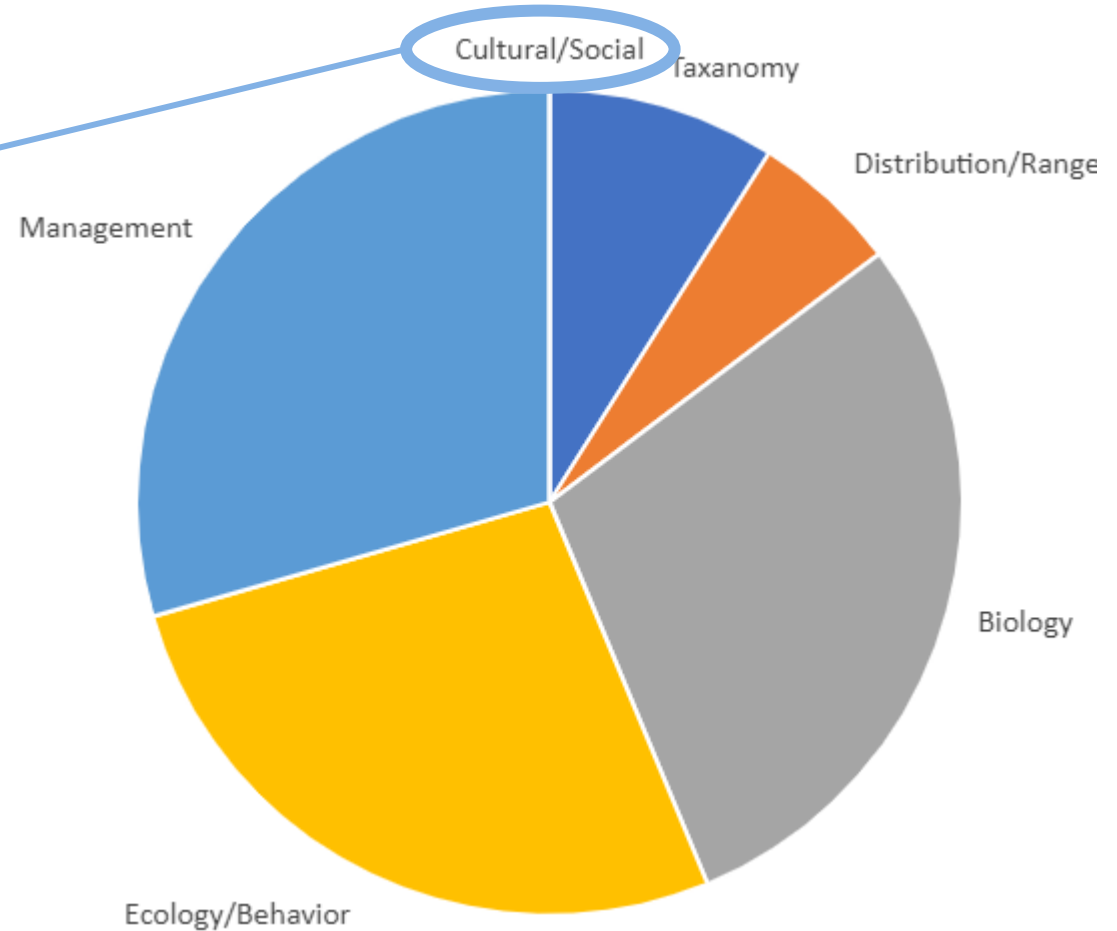


**Country of Origin,
eco-regions...**

Ameiva ameiva

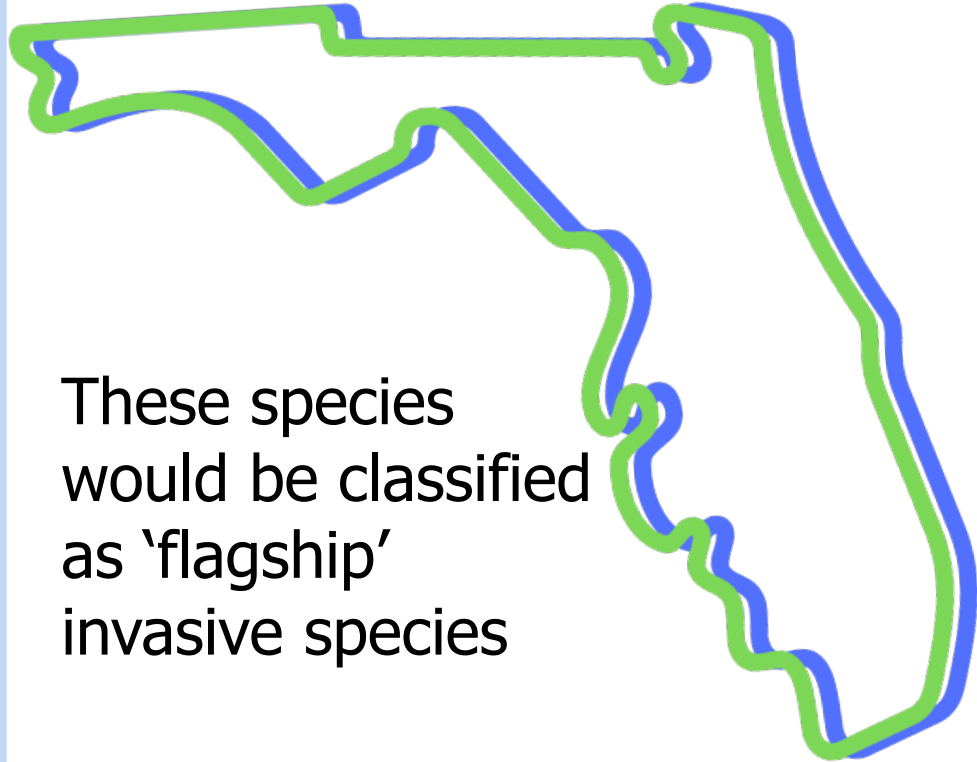
What we **DON'T** know

Little to no cultural or social data on most species, most notes were from their native range



Anolis sagrei

What was **MISSING...**



These species would be classified as 'flagship' invasive species

Despite thousands of observations of these species only **10 species** mentioned FL

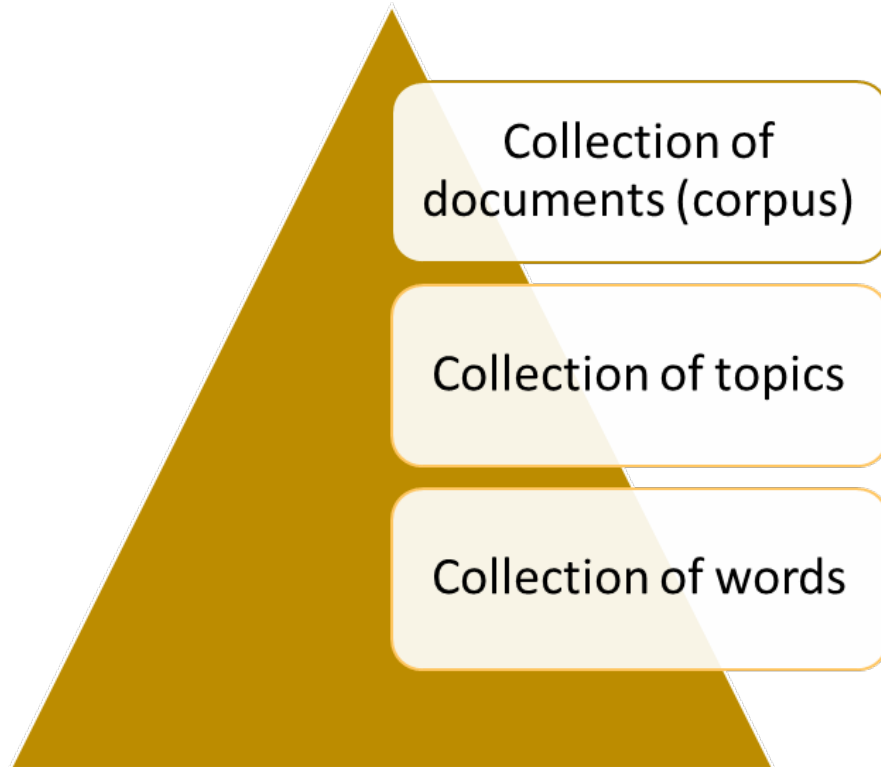
Landscape ecology or distribution was only identified for **10% of these species** (including native range)



Closing the Gaps

Informing Extension & Outreach

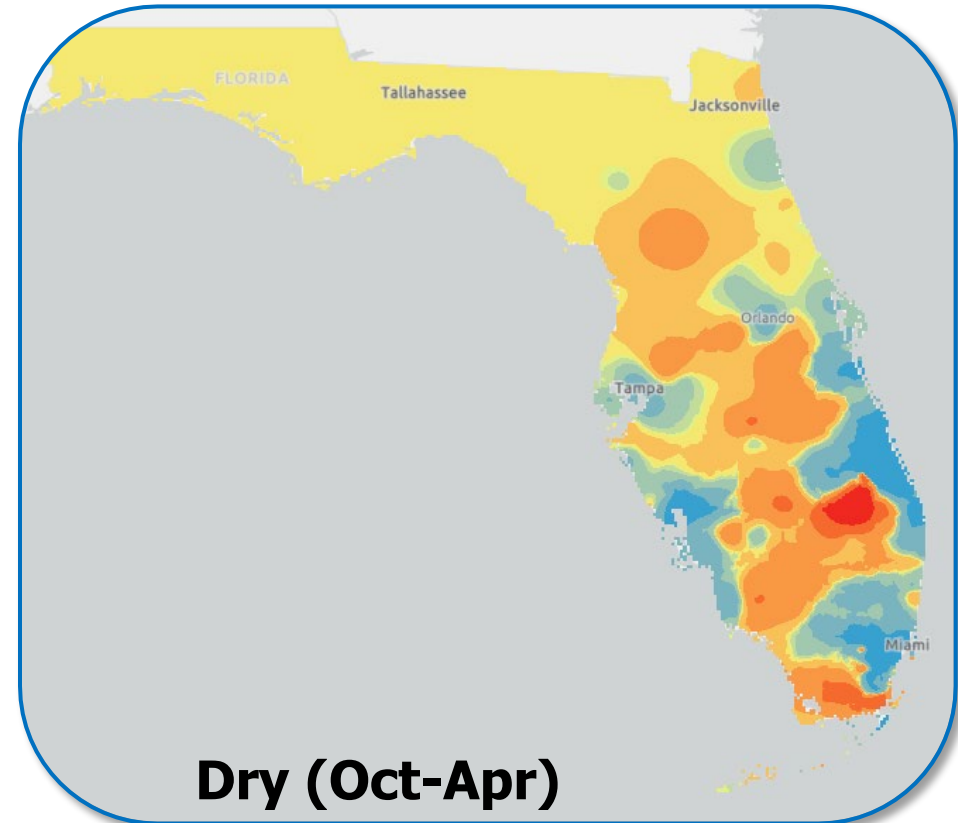
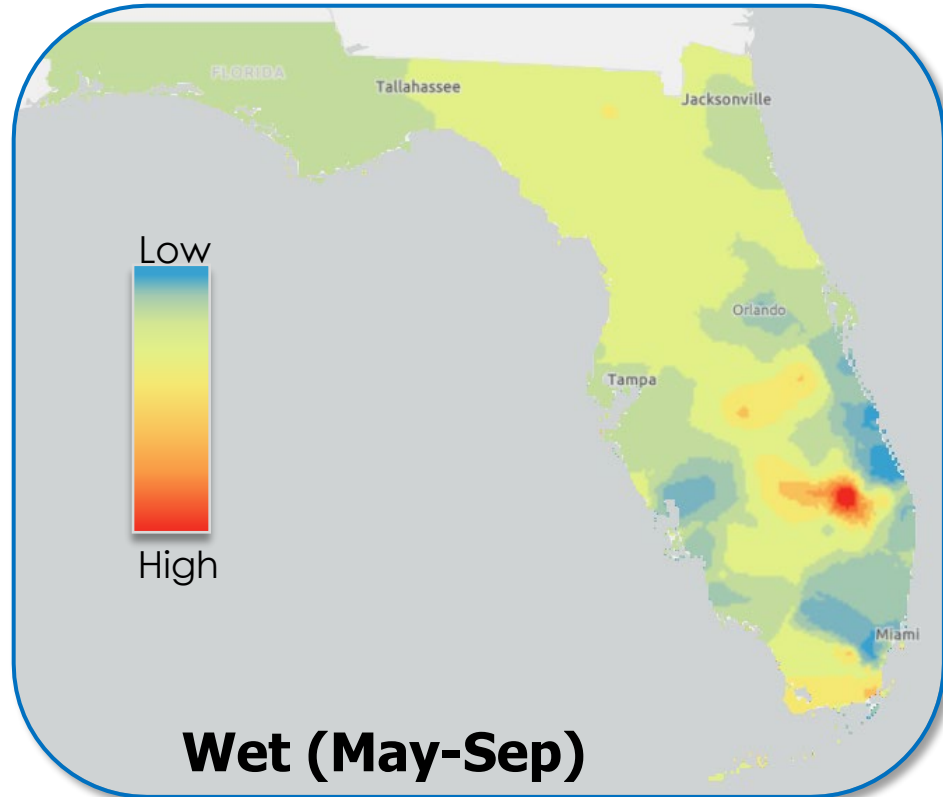
Topic Modeling



Understanding societal trends in terms of invasion science in the media
➤ Insight into topics, framing, and words used

Identifying what is of interest and what is missing in the media to help inform materials for the public

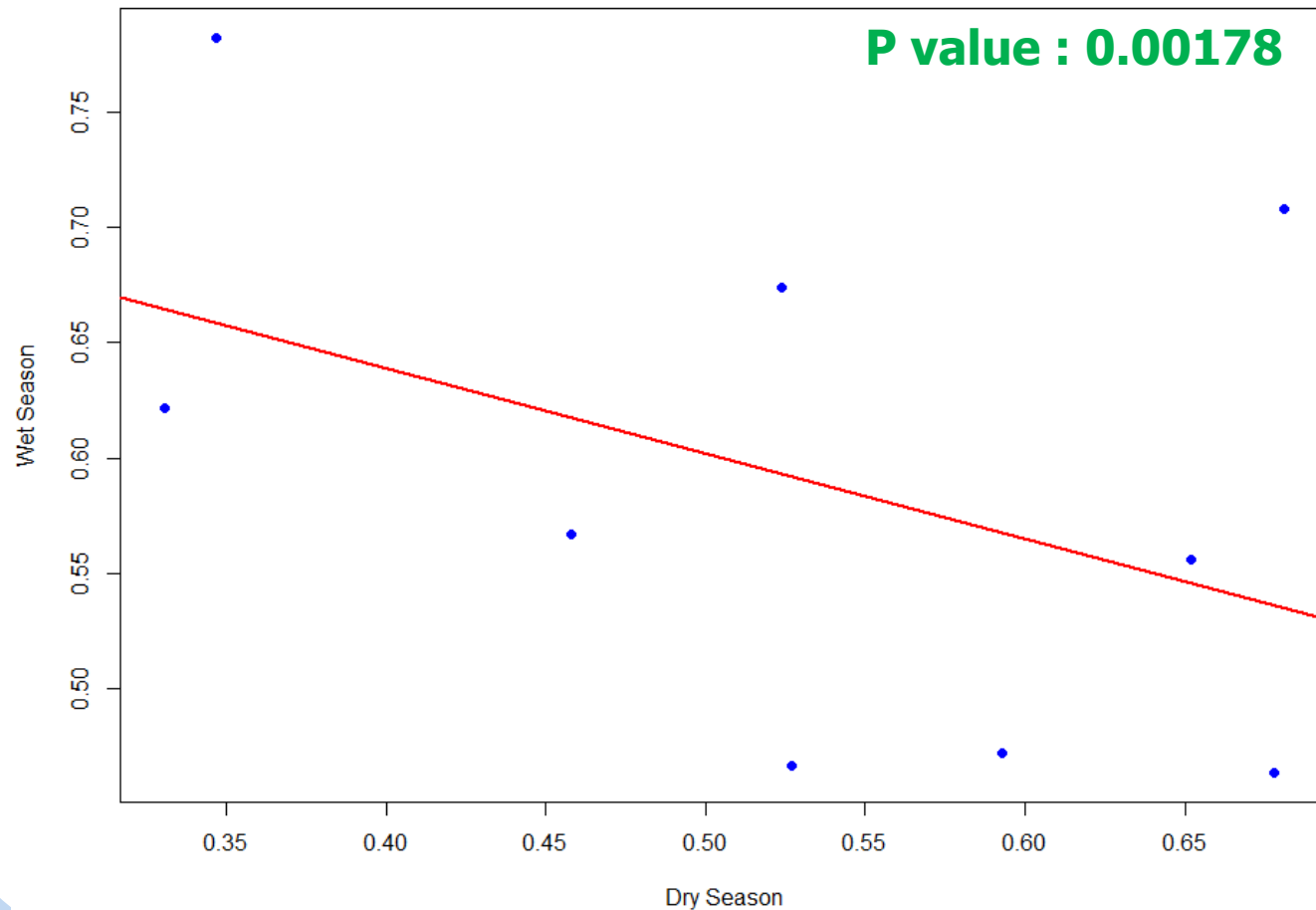
Influencing Research



Agama Lizard

Influencing Research

Evenness of Habitat Occurrence

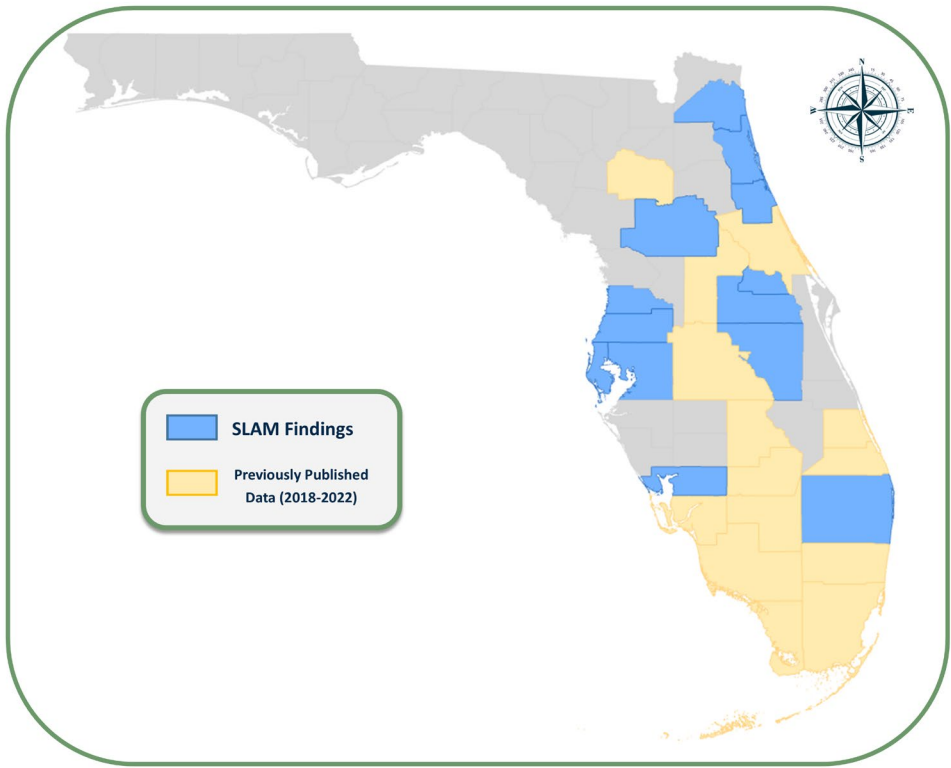


Analyzing comparison of common slopes shows likely significant change in habitat occurrence seasonally.

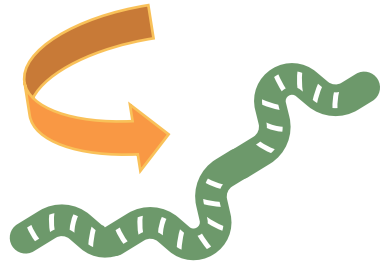


Conclusion

- We don't know a lot...
- However, there is a power in knowing what we don't know
- Lucky for us... that means there a lot more work to do, and to learn



R.O. or *Raillietiella orientalis*



<https://invasionscience.ufl.edu/slam/>

PATERSON, J.E. AND BLOUIN-DEMERS, G. (2018), DENSITY-DEPENDENT HABITAT SELECTION PREDICTS FITNESS AND ABUNDANCE IN A SMALL LIZARD. *OIKOS*, 127: 448-459. [HTTPS://DOI.ORG/10.1111/OIK.04758](https://doi.org/10.1111/oik.04758)

DANIEL ARIANO-SÁNCHEZ, RASMUS MOHR MORTENSEN, STEFANIE REINHARDT, FRANK ROSELL, ESCAPING DROUGHT: SEASONALITY EFFECTS ON HOME RANGE, MOVEMENT PATTERNS AND HABITAT SELECTION OF THE GUATEMALAN BEADED LIZARD, *GLOBAL ECOLOGY AND CONSERVATION*, VOLUME 23, 2020, E01178, ISSN 2351-9894, [HTTPS://DOI.ORG/10.1016/J.GECCO.2020.E01178](https://doi.org/10.1016/j.gecco.2020.e01178).

SHARON DOWNES, RICHARD SHINE, HEAT, SAFETY OR SOLITUDE? USING HABITAT SELECTION EXPERIMENTS TO IDENTIFY A LIZARD'S PRIORITIES, *ANIMAL BEHAVIOUR*, VOLUME 55, ISSUE 5, 1998, PAGES 1387-1396, ISSN 0003-3472, [HTTPS://DOI.ORG/10.1006/ANBE.1997.0705](https://doi.org/10.1006/anbe.1997.0705).

THERMOREGULATORY RESPONSES TO ENVIRONMENTAL SEASONALITY BY THE LIZARD *LACERTA VIVIPARA*. *HERPETOLOGICA*, 43(4), 405–415. [HTTP://WWW.JSTOR.ORG/STABLE/3892143](http://www.jstor.org/stable/3892143)

PAULISSEN, M. A. (1988). ONTOGENETIC AND SEASONAL SHIFTS IN MICROHABITAT USE BY THE LIZARD *CNEMIDOPHORUS SEXLINEATUS*. *COPEIA*, 1988(4), 1021–1029. [HTTPS://DOI.ORG/10.2307/1445727](https://doi.org/10.2307/1445727)

Citation

Perception is Important

Boston.com

Live in Massachusetts? This invasive plant could damage your house's foundation.

Japanese knotweed, an invasive plant extremely difficult to get rid of, has moved into wetlands and



CBS News

198-pound Burmese python fought 5 men before capture in Florida: "It was more than a snake, it was a monster"

The invasive female Burmese python captured at Big Cypress National Preserve weighed 198 pounds – the second heaviest python captured to...

Nov 7, 2023



BBC

Squirrel as
invasive s

The "invasivorism" trend is attempting to combat the threat posed by invasive species – by eating them. Isabelle Gerretsen tucked in to find...

Phys.org

Invasive rodent research may help protect Hawaiian forests

O'ahu, Hawaii, is an island rife with lush nature, expansive ocean views and, increasingly, invasive rodents. House mice, black rats and...





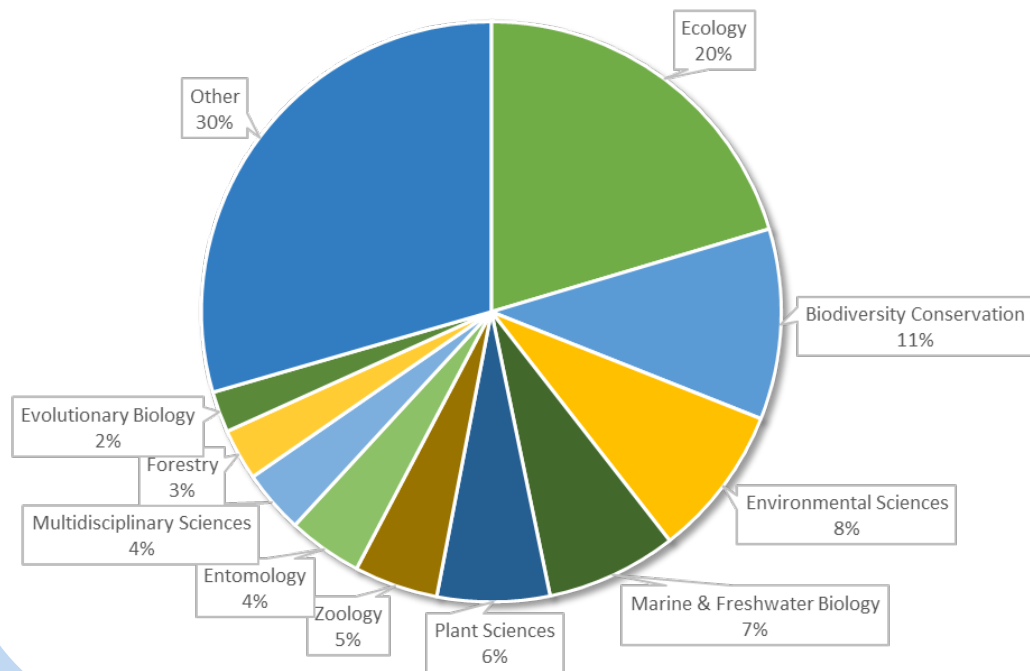
Conclusion

- We don't know a lot...
- Filling knowledges gaps may take time, but is necessary for accurate assessment and management

Informing Research

Bibliometric Analyses

Web of Science Categories within Invasion Science Literature
from 2013-2023 (n = 39,401 articles)



*'Other' category comprised of 217 WoS categories

Wildlife Value Orientations

		<u>Utilitarian</u>	
		Low	High
<u>Mutualism</u>	Low	Distanced Less interest in wildlife-related issues	Utilitarian Characterized by a view of prioritization of human well-being over wildlife
	High	Mutualist Believe that humans and wildlife deserve similar rights	Pluralist Possess both value orientations; expression of one or the other is situational