

# A trait-based comparison of invasive species reporting using general versus invasive species specific community science

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Extension

## How do we stop invasive species?

- Invasive species are ecologically and environmentally destructive
- Catching them early is one of the best ways to stop them
- But there is limited professional staff who can monitor for them
- Biodiversity community science programs may fill this gap

EDDMapS	iNaturalist
Invasive species only	General biodiversity
IDs by experts	Crowd sourced IDs
~100k users	~1 million users

## Reporting bias

- Some species might be noticed and reported more than others
- Exp. A bright red beetle is more eye catching than a black beetle
- Are there traits associated with higher reports of invasive species?
- Do these traits differ between EDDMapS and iNaturalist?

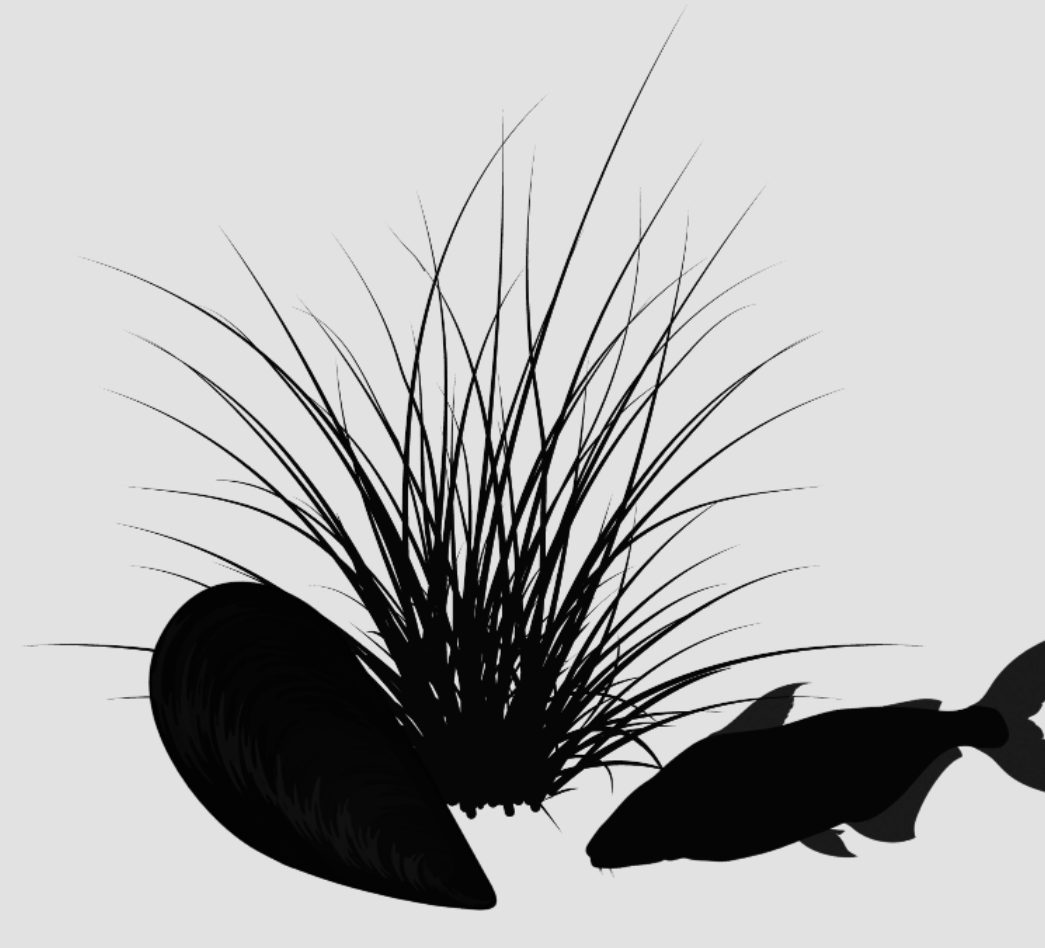
Understanding which traits are most likely to be reported will help focus outreach programs

- Collected all reports of
  - 63 invasive species
  - From 2008-2018
  - In the Eastern United States
  - From the general public
  - From EDDMapS (26,669 reports) and iNaturalist (39,961 reports)
- Divided number of reports of each species by number of states where the organism is present
- Categorized them by 14 traits\*

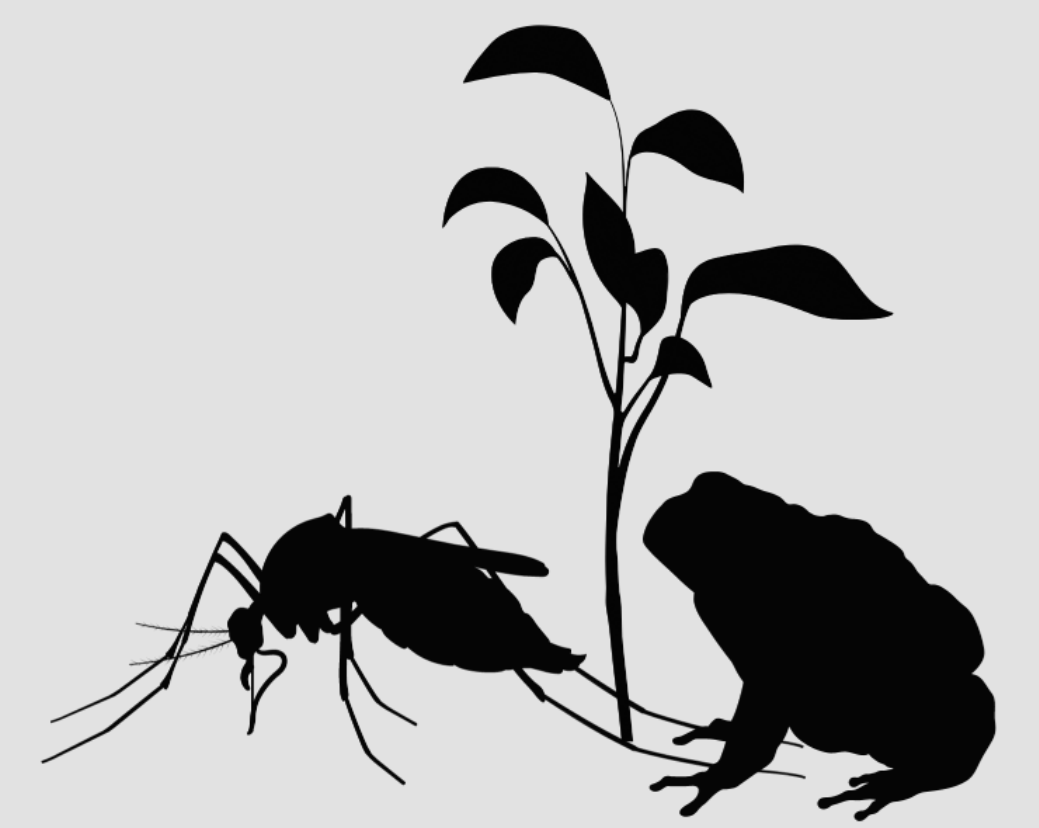
## Methods



High



Medium



Low

**Exp.** Charisma: **high**: positive public perception (e.g. mute swans), **Medium**: neutral public perception (e.g. round goby), **low**: poor public perception (e.g. Asian tiger mosquito)

\*Categories: subphylum, habitat, activity time, flashy appearance, flashy behavior, directly harms humans, in the pet trade, charisma, trophic position, fruit type, presence of flowers, actual size, relative size, found in large groups

## Results and Conclusions

Three traits significantly predicted the number of reports:

- Habitat type (aquatic=8.7±7.8 SE and terrestrial 54.2±6.4 reports/state; df=1, 61; F=20.2; P<0.0001)
- Subphylum (df=2, 61; F=3.6; P=0.029)
- Charisma (df=2, 61; F=5.1, P=0.0087)
- Reports didn't differ between EDDMapS and iNaturalist

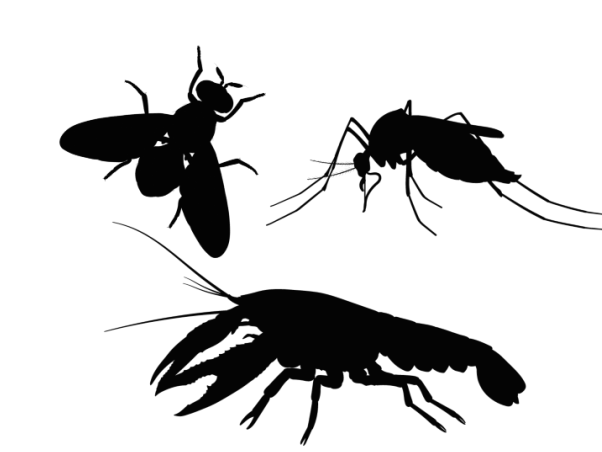
## Future work

- Add a category: presence of species specific reporting campaigns
- Factor in # of users/app
- Add other databases (e.g. eBird)

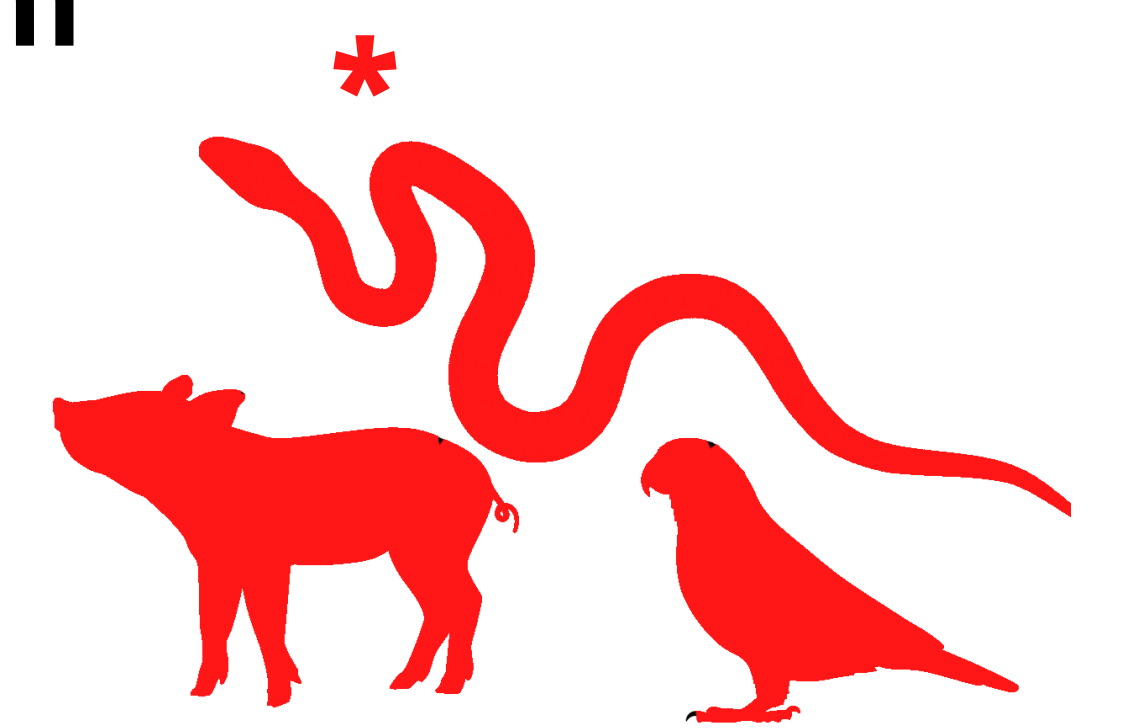
## Subphylum



Plants  
37.9±7.6 SE reports/state

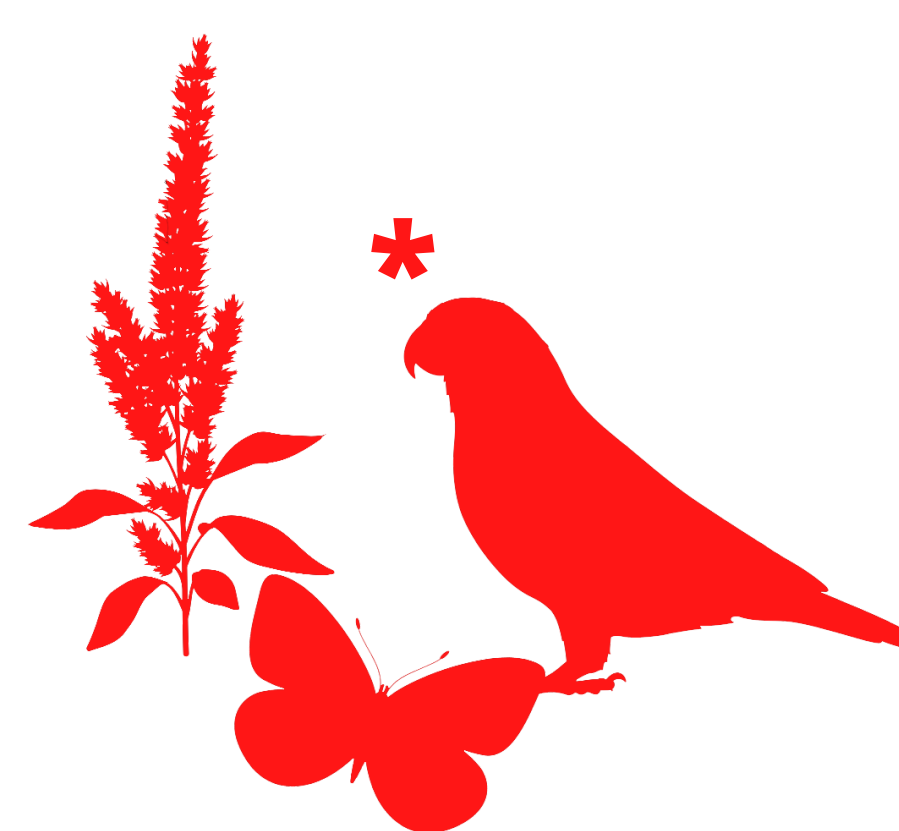


Invertebrates  
17.7±9.5 SE reports/state

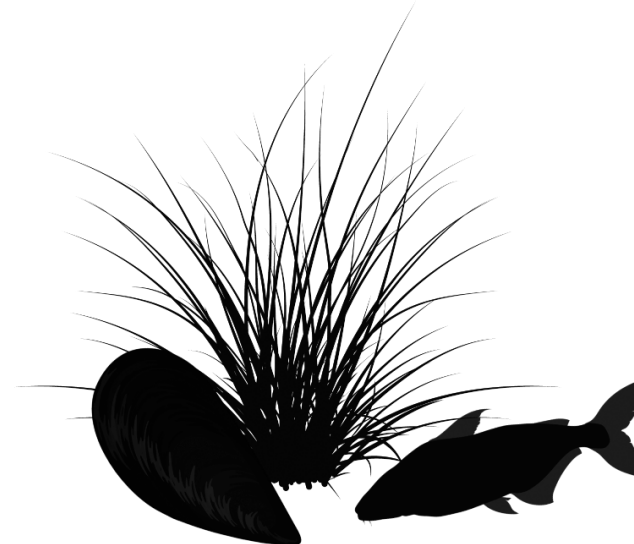


Vertebrates  
56.5±11.0 SE reports/state

## Charisma



High  
121.2±19.3 SE reports/state



Medium  
49.4±17.0 SE reports/state



Low  
38.0±23.7 SE reports/state

Questions? Comments?

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images made with BioRender