

ALIEN LANGUAGE: REFLECTIONS ON THE RHETORIC OF INVASION BIOLOGY

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A BRIEF INTRODUCTION

- El Lower (they/them)
- Michigan Sea Grant
- GLANSIS research associate
- Spends a *lot* of time thinking about effective science communication re: invasive species



FIGHTING FOR THE GREAT LAKES?

- My pre-pandemic work involved science communication work at outreach events
- Loaded language is common when talking about invasive species management...but can have unintended consequences.



THE RHETORIC OF INVASION

- Species naming conventions
- Metaphors used in invasion biology
- Where do we go from here?



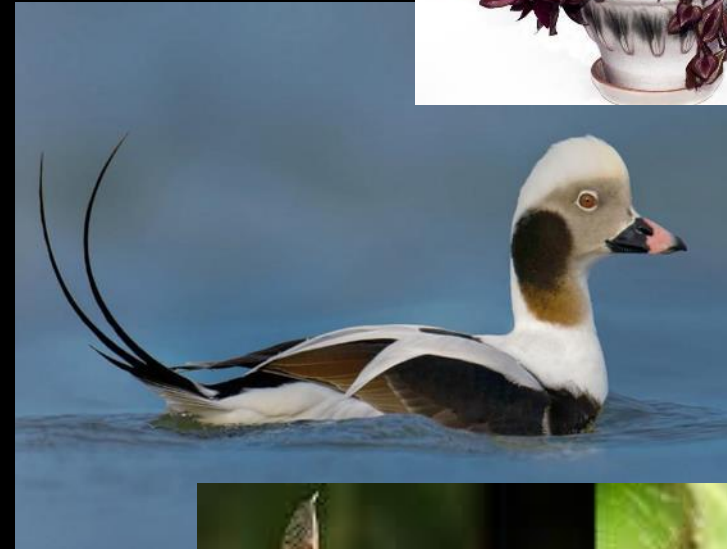
WHAT'S IN A (SPECIES) NAME?

- Scientific naming conventions (both to Latin binomial and common names) are increasingly being examined through the lens of inclusive science across disciplines
- Three major issues being discussed:
 1. Culturally insensitive or inappropriate names
 2. The utility of place-based names
 3. What to do about species named for historical figures with problematic legacies



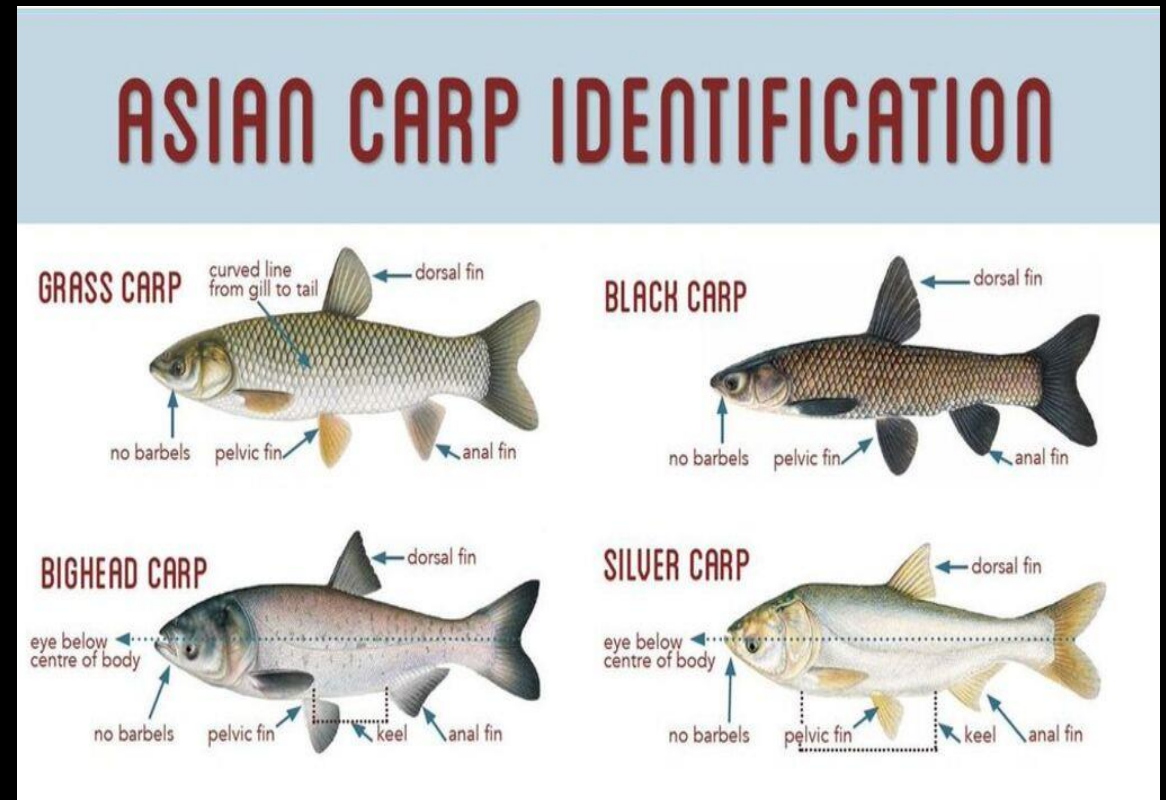
CULTURALLY INSENSITIVE NAMES

- Unfortunately more common than people realize
- Many examples across different taxa
- Causes ongoing problems for effective science communication
- A success story: *Lymantria dispar*
 - Previously had a derogatory common name
 - Now known as the spongy moth
 - Advocated for by the Entomological Society of America's Better Common Names Project



PLACE-BASED NAMES

- A few have some inherent problems...
- ...but for many more it's the political implications that are the issue.
- “Asian Carp”
 - Actually four separate fish species
 - Not very descriptive
 - Attracts racist invective
 - Many agencies transitioning away from this term for improved message clarity



NAMES AND TROUBLED LEGACIES

- Some well-known historic naturalists and public figures have species named after them...and awful legacies.
- No standard procedure for name changes in this case, but advocacy for change has worked
- Using indigenous species names is an increasingly popular proposed alternative



WHERE DO WE GO FROM HERE?

- Continuing the conversation:
 1. How do we develop guidance for changing species names when necessary?
 2. How do we get buy-in for these changes across research agencies, professional societies, and the public?
 3. What are best practices for more inclusive naming conventions in future scientific discoveries?



METAPHORS BE WITH YOU

- Metaphors make complex concepts easier to understand, *but* may also imply values or intent where none are actually present – especially in biological contexts
- Used *carefully*: can reveal new scientific insights + communicate complex concepts
- Used *carelessly*: can cause reasoning errors, undermine objectivity, create misunderstandings, and reinforce stereotypes

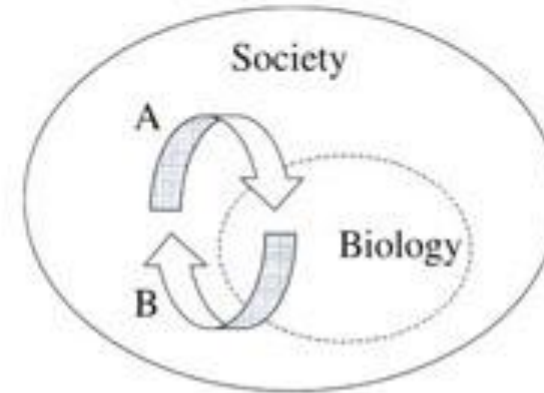
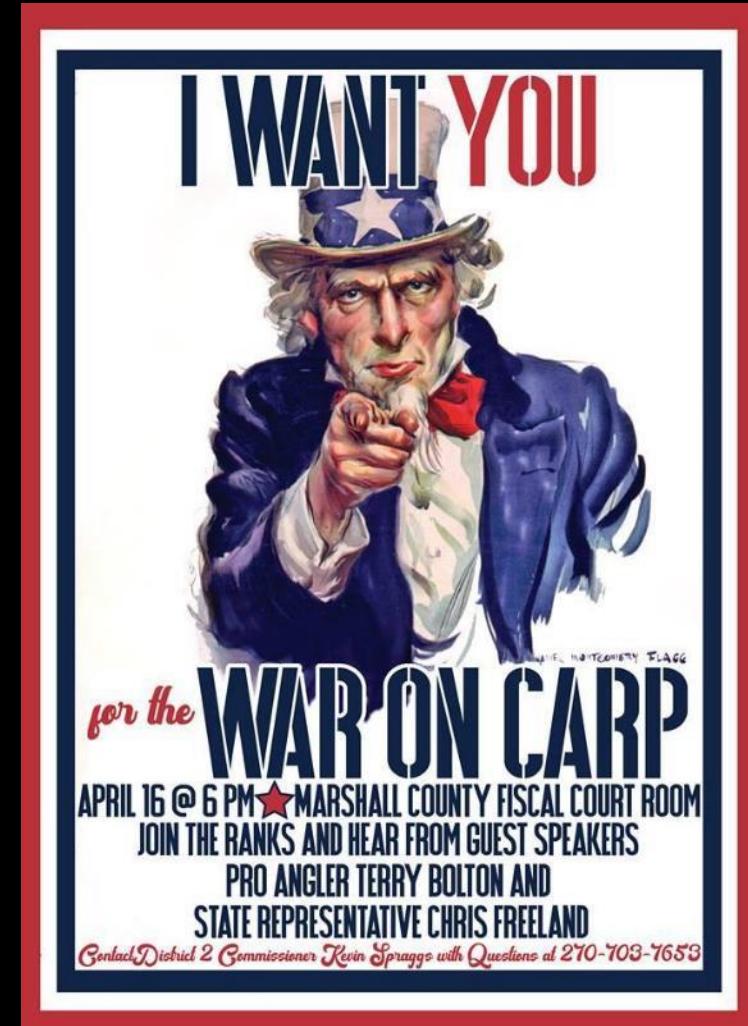


Figure 1. Metaphors as cultural messengers. This figure emphasizes that metaphors move bidirectionally between science and society, creating a circularity (A, from society into biology; B, from biology into society). When biologists select a metaphor (A) they may endorse particular cultural values and assumptions, which may reinforce them within our thought, language, and worldview (B). For elaboration, see Larson (2004).

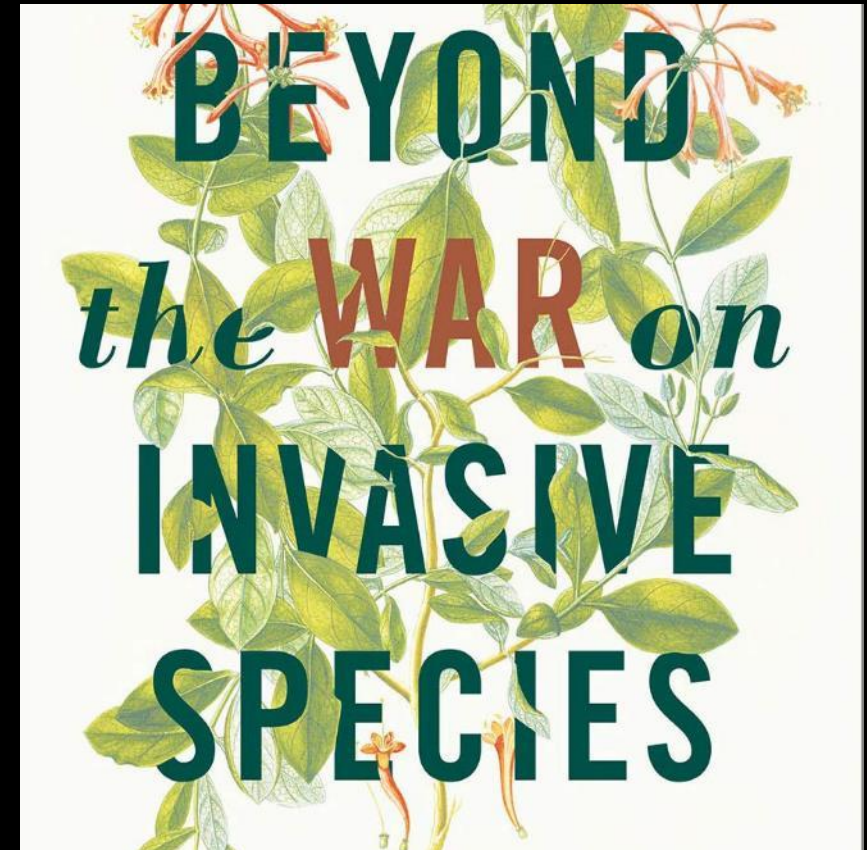
MILITARY METAPHORS

- Invasion itself is a military metaphor.
- “The War on X”
- Useful framework for:
 - encouraging personal action
 - resonating with historic national sentiments
 - rallying support for management efforts
- However....



THE TROUBLE WITH MILITARY METAPHORS

- “Good vs. evil” doesn’t actually play out in ecology
- Sidesteps the reality that human actions are responsible for introducing these species in the first place
- Can harm the morale of scientists and managers who feel like they’re “fighting a losing battle”



NATIVIST METAPHORS

- “Native = good, foreign = bad”
- Useful framework for:
 - stirring up protective instincts
 - attracting attention and engagement
- However...

Alien Invasion: They're green, they're mean, and they may be taking over a park or preserve near you (Cheater 1992); Aliens Reeking Havoc; The Invasion of the Woodland Soil Snatchers (Stewart 2001); Native species invaded (ABC News 1998); Bio-invasions spark concerns (CQ Researcher 2000); It's a Cancer (Verrengia 1999a);¹⁰ Creepy strangler climbs Oregon's least-wanted list (Brinckman 2001); Biological Invaders Threaten U.S. Ecology (McDonald 1999); U.S. can't handle today's tide of immigrants (Yeh 1995); Alien Threat (Bright 1998); Biological Invaders Sweep In (Enserink 1999); Stemming the tide of invading species (Kaiser 1999); Congress Threatens Wild Immigrants (Weiner 1996); Invasive Species: Pathogens of Globalization. (Bright 1999)

(Subramaniam 2001)

THE TROUBLE WITH NATIVIST METAPHORS

- Can cross the line into xenophobic or even racially discriminatory language
- Parallels a history of exclusionary immigration practices
- Can backfire – your audience may start to identify with the species in question instead!

Table 1. Regulations and laws relating to human immigration and introduced species in the United States.








Introduced species	Immigration
California state quarantine 1881	Chinese Exclusion Act 1882
California fruit pest law 1883	Beginning of Ellis Island restrictions 1901
Lacey Act 1900	National quotas 1921
Plant Quarantine Act 1912	Immigration Act 1924

(Simberloff 2003)

A CASE STUDY: THE HATEFUL 8?

- “Top Great Lakes invasive species” manuscript
- Is the movie reference actually worth it?
- Renamed to “The Great Lakes’ Most Unwanted”

THE HATEFUL 8

1 Zebra Mussel (<i>Dreissena polymorpha</i>) <ul style="list-style-type: none">• Total impact score: 55• Outcompetes native species for nutrient resources, fouls infrastructure and watercraft, impairs water quality, negatively affects recreation and aesthetics. 	2 Quagga Mussel (<i>Dreissena bugensis</i>) <ul style="list-style-type: none">• Total impact score: 45• Outcompetes native species for nutrients, impairs water quality, fouls infrastructure and watercraft, negatively affects recreation and aesthetics. 
3 Alewife (<i>Alosa pseudoharengus</i>) <ul style="list-style-type: none">• Total impact score: 32• Causes thiamine deficiency in fish that consume them, mass die-offs impair water quality and foul beaches, competes with and prey on larvae of other fish. 	4 Sea Lamprey (<i>Petromyzon marinus</i>) <ul style="list-style-type: none">• Total impact score: 30• Preys on native fish species, impacts commercial and recreational fisheries, requires costly management and control measures. 
5 Round Goby (<i>Neogobius melanostomus</i>) <ul style="list-style-type: none">• Total impact score: 26• Outcompetes native species for food and spawning areas, preys on eggs and fry of native species, negatively impacts recreational fishing. 	6 White Perch (<i>Morone americana</i>) <ul style="list-style-type: none">• Total impact score: 20• Outcompetes and preys on eggs and larvae of native species, influences harmful algal blooms, can hybridize with native white bass. 
7 Bacterial Kidney Disease (<i>Renibacterium salmonarium</i>) <ul style="list-style-type: none">• Total impact score: 18• Infectious disease of trout and salmon, causing high morbidity and mortality, harming commercial and recreational fisheries. 	8 Eurasian Watermilfoil (<i>Myriophyllum spicatum</i>) <ul style="list-style-type: none">• Total impact score: 16• Negatively impacts aquatic habitat, reduces biodiversity, entangles boat propellers and impedes waterway recreation. 

ALTERNATIVE METAPHORS?

- Non-local beings (TCAM, 2019)
 - **Ojibwe:** *Bakaan ingoji gaa-ondaadag* (“that which comes from somewhere else and now resides here”)
 - **Kimberly Aboriginal:** *Kartiya* (non-local, introduced by non-Aboriginal humans)
- “Cheeky” plants (Bach and Larson, 2017)
 - Focus on behavior, not indigeneity
- Focus on restoring balance + maintaining health
 - Invasive species as an acute or chronic illness



ECOLOGICAL BULLIES?

Bullying:

- Useful metaphor with all age groups, but especially students
- Focuses on negative *behavior*, not point of origin
- Still emotionally loaded and encourages action



TOWARDS MORE THOUGHTFUL LANGUAGE

- Thoughtful language use in resources for students is especially important
- The better language and more diverse metaphors we have to work with, the better we can tailor our messaging as science communicators



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