

Introduced Species & Species Interactions

Lecture and Jigsaw Activity



Species interactions

Species interactions are classified based on reciprocal effects

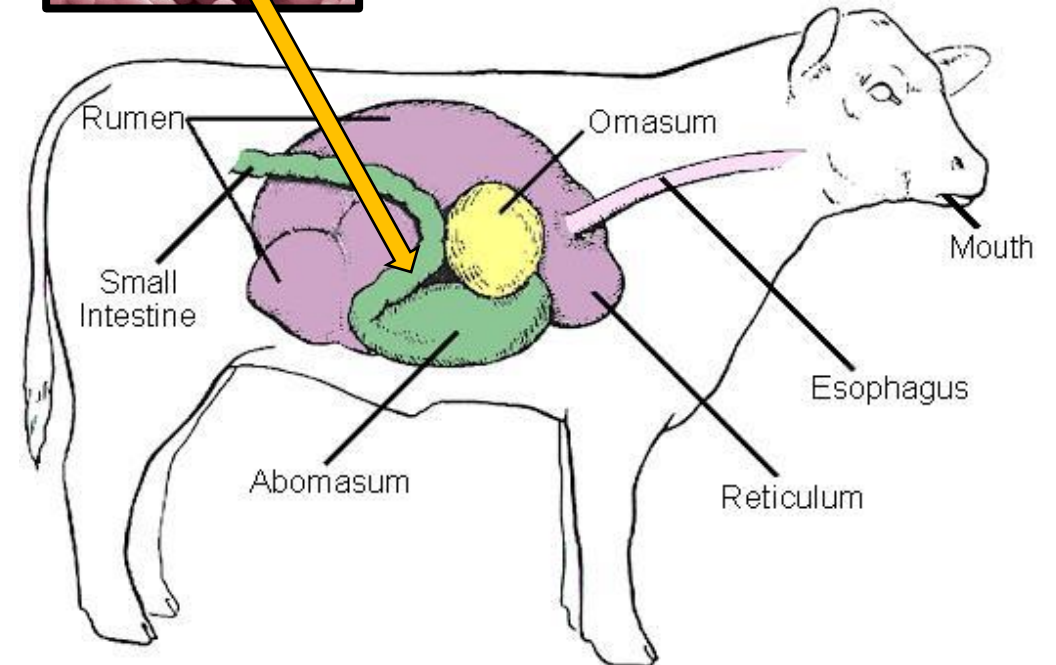
- i.e., the effect of one species population on the other species populations
- positive (+), detrimental (−), or neutral or no effect (0)

Interaction Type	Species 1	Species 2
Amensalism	−	0
Commensalism	+	0
Competition	−	−
Mutualism	+	+
Neutral	0	0
Parasitism	+	−
Parasitoidism	+	−
Predation	+	−

Species interactions

Mutualism

- When both species mutually benefit from the interaction
- The relationship is (+ +) positive for both
- Pollinators get nectar, plants spread pollen
- e.g., ungulates and intestinal bacteria



Species interactions

Commensalism

- When one species benefits and the other is unaffected
- The relationship is (+ 0): beneficial for one, neutral for the other
- e.g., orchids benefit from growing on trees, but trees are unaffected



Species interactions

Competition is detrimental to the populations of both species (– –)

- Both species compete for a resource or resources

Amensalism is detrimental to one species while the other is unaffected (– 0)

- Asymmetric competition
- Taller plant species shades a shorter plant species



Species interactions

There are multiple types of relationships where one species benefits, but the other is harmed (+ –)

Predation

- One species feeds on another, killing it



Parasitism

- One species feeds on another, reducing its fitness but not killing it
- **Brood parasitism:** one species trick other species into raising their young (e.g., cuckoos)



Parasitoidism

- One species uses another for reproduction, and its larvae feed on it, eventually killing it



Introduced and Invasive Species Terminology

Native species: a species that occurs naturally in a specified geographic area and has coevolved with the species around it (typically based on whether it was here prior to European contact)

Introduced species: a species brought to a new geographic area intentionally or unintentionally by humans (also called *alien*, *exotic*, *non-native*)

Invasive species: an established/naturalized (i.e., self-sustaining and reproducing) species that causes harm to the economy, environment, or human well-being.

Another primer on invasive species: <https://www.youtube.com/watch?v=yIgysZ5Hho8>



Native species can be “invasive” too..



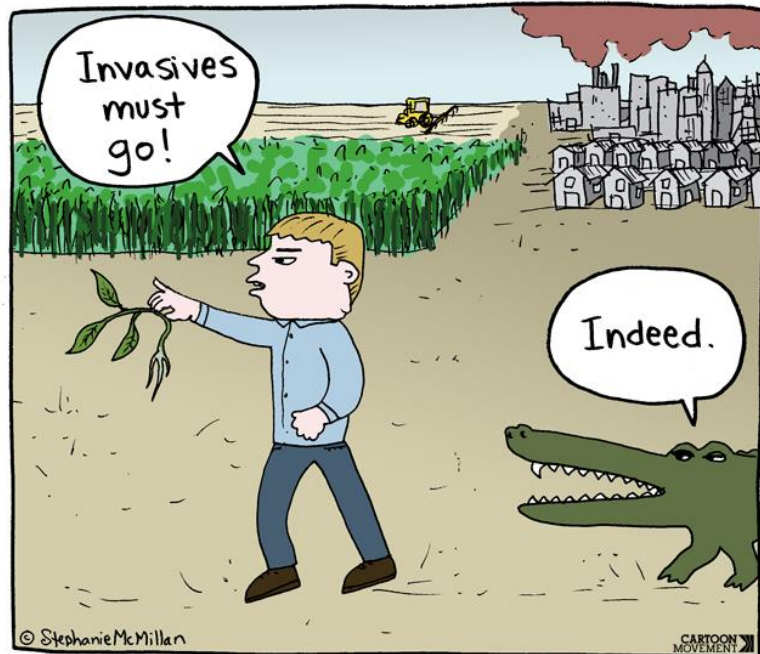
Human Perceptions of Introduced & Invasive Species

- Some people view all introduced and invasive species as “bad”
- All introduced species should be prevented or eradicated, if possible, to limit the risk of them establishing and becoming invasive



Human Perceptions of Introduced & Invasive Species

- Some people view humans as part of the global environment and think humans are the invasive species
- All management that needs to be done is to correct for human mistakes and human impacts on the landscape



Human Perceptions of Introduced & Invasive Species

Some Indigenous perspectives regard introduced species as displaced relatives and useful...



*“The irony is that for many who are in the environmental sciences, **most of these invasive species are their plant relatives** as these were introduced during colonial times by settlers and colonizers. This means that **many people have lost their ancestral roots** due to assimilation and, as a result, **they have lost their relationships with the same plants** they now deem as terrible beings. Regardless of whether this plant belongs there or not, we must ask its spirit for permission. **We acknowledge them as displaced relatives**, since at the end of the day, they are also someone’s plant relatives.” – Dr. Jessica Hernandez*

<https://www.popsoci.com/environment/fresh-banana-leaves-jessica-hernandez-excerpt/>

DANDELION

TARAXACUM OFFICINALE

PROBLEM: Dandelions are generally harmless but still considered a weed.

RESPONSE: Offer as a treatment in traditional Indigenous medicine.

SOURCE: NICHOLAS REO

*“Introduced plants, like native plants, are **regarded as persons** that have their own intelligence, role, and way of being. What are they bringing us? **What are they trying to teach us?**” -Dr. Robin Wall Kimmerer*

<https://www.biohabitats.com/newsletter/traditional-ecological-knowledge/leaf-litter-talks-with-dr-robin-wall-kimmerer/>

*“**Every plant and animal is useful to us.**” – Dr. Nicholas Reo*

<https://www.cbc.ca/radio/unreserved/earth-day-indigenous-scientists-academics-and-community-members-take-the-lead-in-environmental-causes-1.4605336/every-plant-and-animal-is-useful-to-us-indigenous-professor-re-thinking-how-we-deal-with-invasive-species-1.4605344>

Human Perceptions of Introduced & Invasive Species

- Some view invasive species as a possible source of food or products that can be used by humans or other animals.
- Naturalized invasive species have worked their way into local traditions (e.g., people relying on hunting feral hogs for food/tradition)

Asian carp could pulverize world hunger, MU researcher finds

Powdering Asian carp could address an environmental problem and a global malnutrition crisis.

Feb. 17, 2021

Austin Fitzgerald, 573-882-6217, fitzgeraldac@missouri.edu

TEXAS

Hog hunting controversy: Why poison approval has many upset

For years, Texans have been united on the war against feral hogs. The invasive species causes millions of dollars in damage to properties every year. However, there's a new battle brewing when it comes to how the state tries to get rid of the animals, since Texas recently approved a controversial method of killing hogs.

Author: Phil Anaya

Published: 3/22/2017 6:19:57 AM

Updated: 6:35 AM CDT March 22, 2017

Human Perceptions of Introduced & Invasive Species

It's time to stop demonizing "invasive" species

Climate change is forcing some animals to move. Don't call them
"invasives."

By Marina Bolotnikova | Nov 28, 2021, 8:00am EST

BRANDON KEIM SCIENCE FEB 28, 2011 5:43 PM

Sometimes Invasive Species Are Good

Invasive species are the stock villains of conservation biology, disrupting ecosystems and throwing native populations into disarray. But in certain cases, they're actually quite beneficial, and perhaps it's time to recognize that. In California, for example, native butterflies feed on non-native plants. In Puerto Rico, alien trees help restore abandoned pastures to a condition suitable [...]

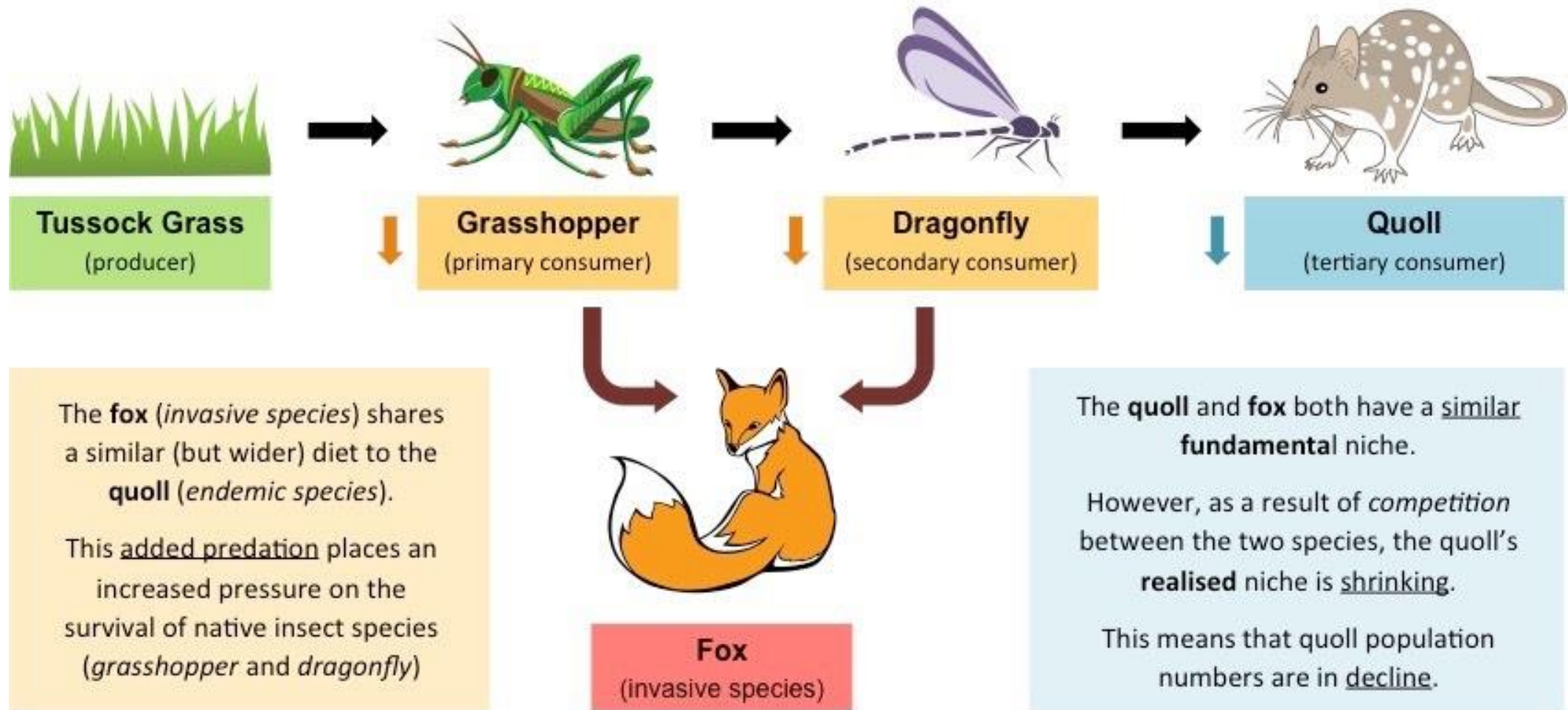
Invasive Species Aren't Always the Bad Guys

For some plants struggling to keep up with climate change, invasive species may
be the lifeline they need

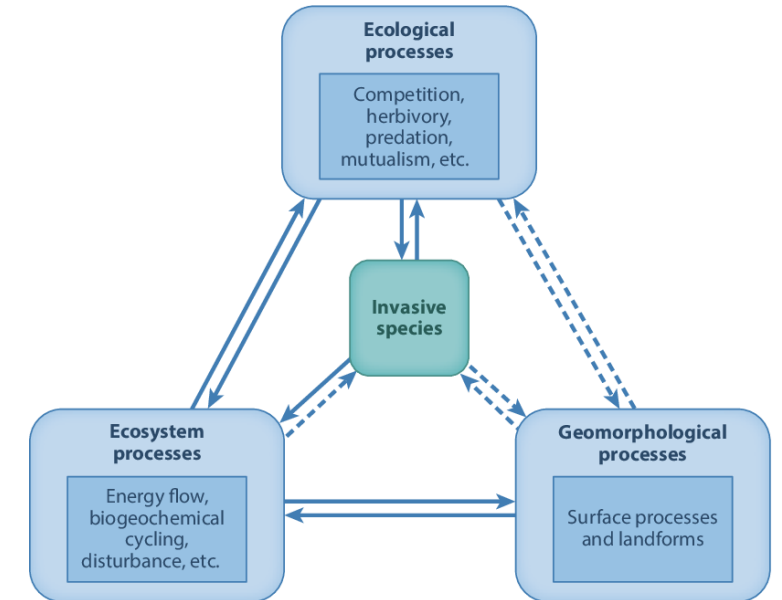
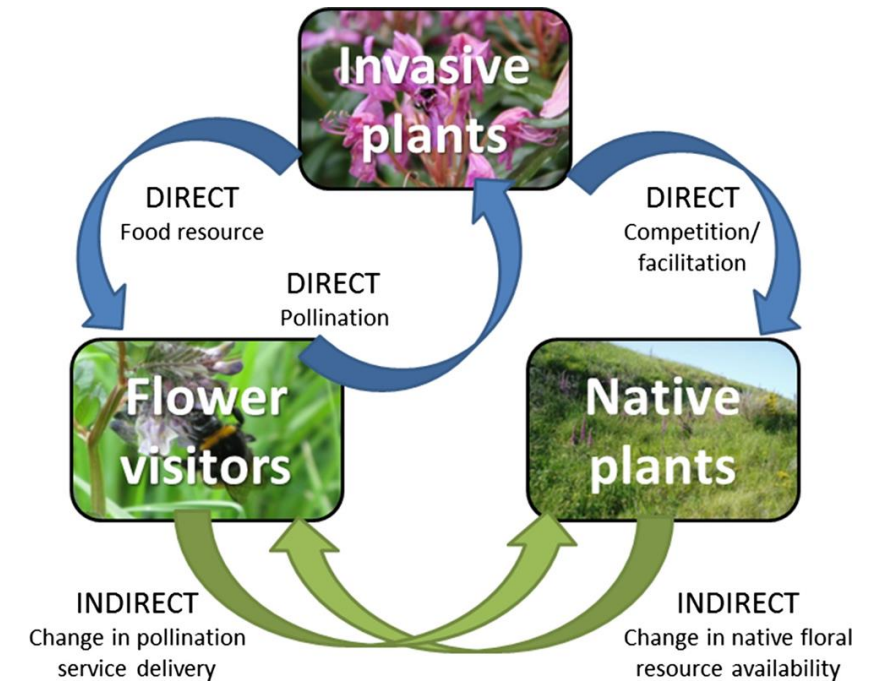
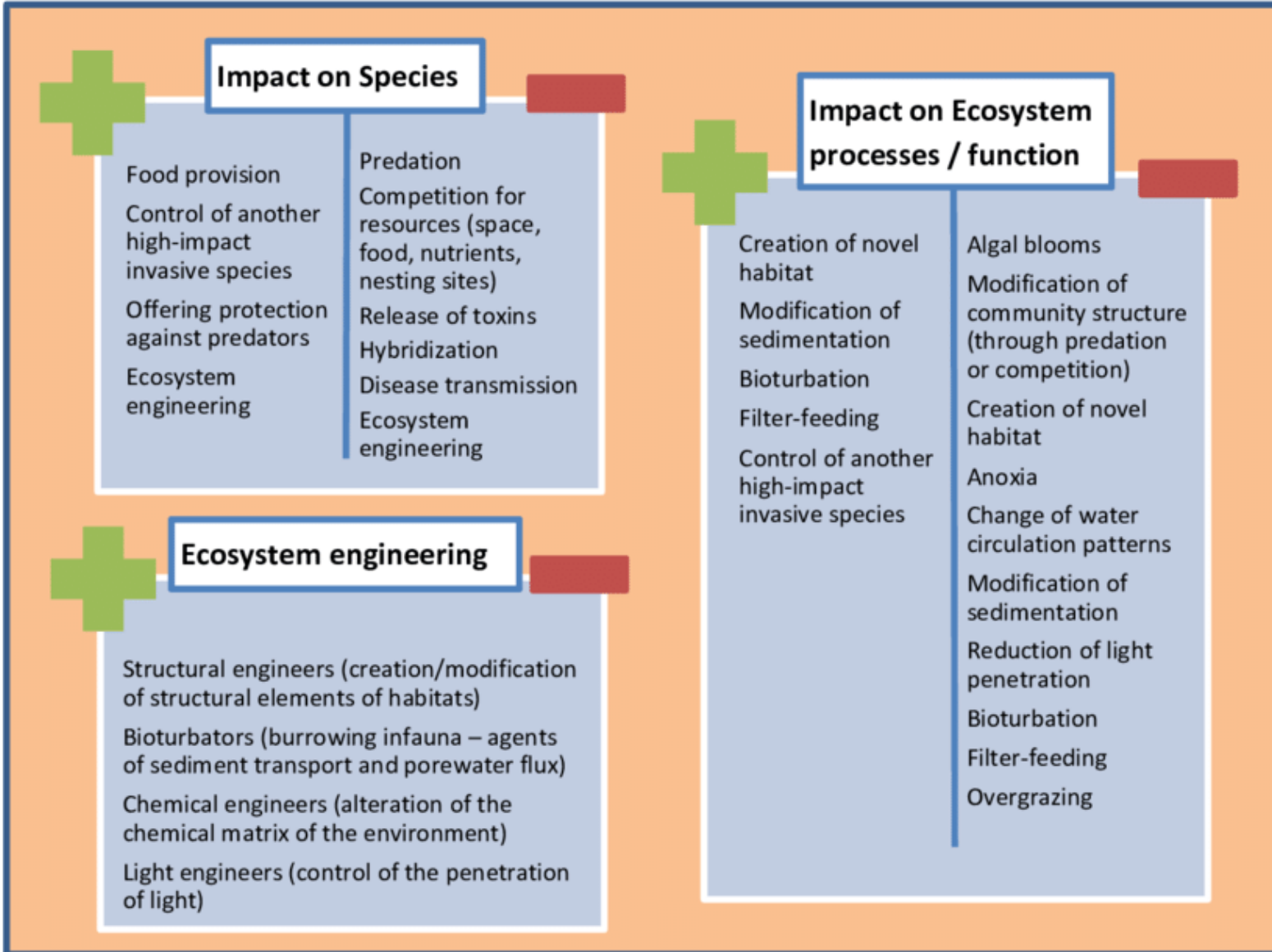
By Isobel Whitcomb | Feb 17 2022



Are all introduced species bad? What impacts can they have?



Introduced Species Impacts



Introduced Species

1



European honey bee
(*Apis mellifera*)

2



European starling
(*Sturnus vulgaris*)

3



feral pig/wild boar
(*Sus scrofa*)

4



hydrilla
(*Hydrilla verticillata*)

5



silver carp
(*Hypophthalmichthys molitrix*)

Jigsaw activity

Round 1: Independent Reading

Receive your fact sheet and take time to read through it quietly before moving to Round 2. Think about key points.

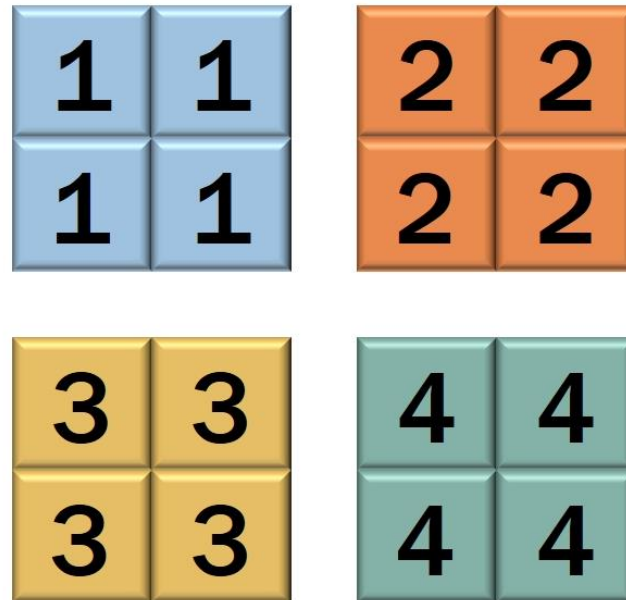
(5-10 minutes)



Round 2: Focus Groups

Discuss 3 key points about your species to share with others in Round 3. Write your key points down on your worksheet.

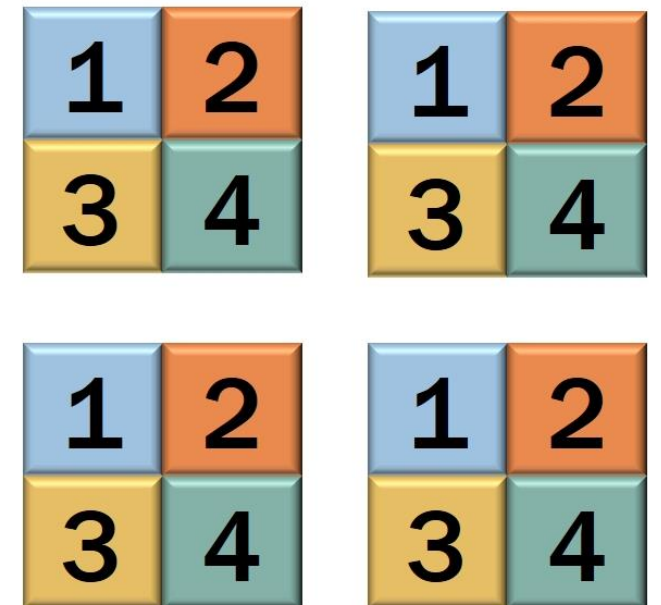
(15-20 minutes)



Round 3: Sharing Groups

Each individual will share 3 key points about their species, so you can learn about 4 other species. Write the key points for those species on your worksheet.

(3-4 min/person, 15-20 min)





Jigsaw Reflection Activity

- Complete your worksheet with your 3 key points for each species.
- Write a reflection at the bottom of the worksheet.
 - What did you find interesting about these species you learned about during the activity?
 - How did your perceptions of introduced and invasive species change as a result of this class? Why do you think that is?

