



## Invasion! Activity Lesson Plan

Age Range: 4<sup>th</sup> – 9<sup>th</sup> grade

Time: 15 – 20 minutes



**Goal:** Provide students with demonstration on how invasive species cause harm to an ecosystem after being introduced. Explain how invasive species cause disruptions and damage to multiple levels of an ecosystem and can contribute to an ecosystem's collapse if other pressures overwhelm multiple trophic levels.

**Materials:** Flags or bandanas of a bright color (half the number of class size), Species Cards printed and cut out, pennies of 3 different colors or some other way of showing "teams", and 4 – 6 cones to mark "safe-zones."

### Game Setup:

- Cones should be set up to indicate the "safe-zone" for Groupers
- Assign students one of the three roles using the species cards and give them the appropriate penny or jersey color. There should be approximately 2 Sharks and 2 Lionfish for every 5 Groupers.
- Flags should be randomly scattered outside of the "safe-zone" area

### Lesson Outline:

- Provide background information on how invasive species affect ecosystems in several ways: preying directly on native species, damaging or competing for habitat space, spreading pathogens, and competing for prey or habitat with native species. Invasive species, like lionfish, can affect an ecosystem through one or several of these impacts.
- Grouper is an example of a mesopredator in a Florida ecosystem that is impacted by lionfish. Grouper are not directly preyed on by lionfish, except in cases of very young grouper encountering adult lionfish. However, grouper and lionfish use the same habitat space and compete for similar prey items. Grouper will change behavior or even relocate if lionfish invade their range. This activity will show how grouper have to balance typical pressures like avoiding predators, finding habitat, and capturing prey while competing with lionfish for these resources. Lionfish do not have to worry about predators in the invaded range and can devote more energy to finding habitat and capturing prey.

### Roles:

- Grouper (Native): Groupers can be "eaten" by sharks if they get tagged by one. Their goal is to get food (flag) and make it back to the "safe-zone"
- Lionfish (Invasive): Their goal is also to get food and make it back to the safe-zone, but they are not hunted by sharks
- Sharks: The goal of the sharks is to "eat" as many Groupers as possible

**Game Play:**

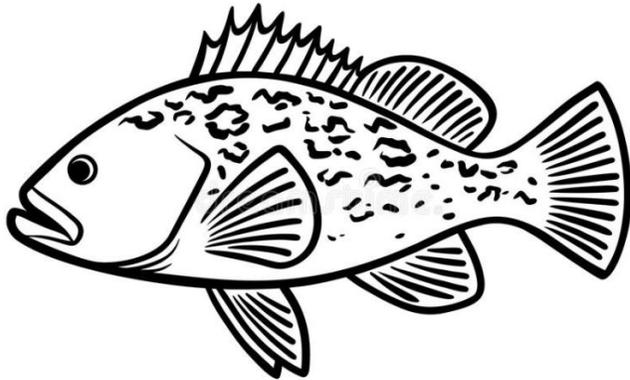
- Teacher indicates the start of each round. Groupers and Lionfish must retrieve a flag and return to the safe-zone. Any students that were tagged or failed to retrieve a flag will switch teams. (Groupers would become Lionfish and Lionfish would become Groupers)
- At the end of each round flags are re-scattered
- This repeats for an allotted number of rounds or until the Groupers or Lionfish go extinct (all get tagged)

**Follow-up Discussion:**

- Which team Groupers or Lionfish had the most students at the end? Why do you think this is?
- How did the presence of Lionfish affect the Groupers? How did it affect the sharks?
- What other impacts could Lionfish have on the ecosystem?

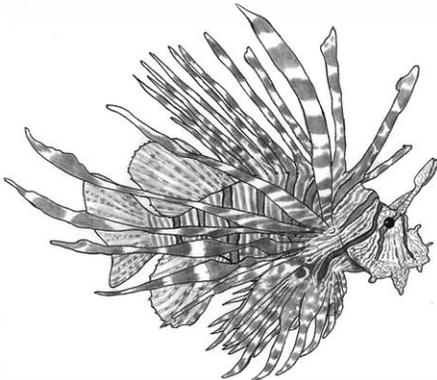
Species Cards for Invasion! Activity

Grouper



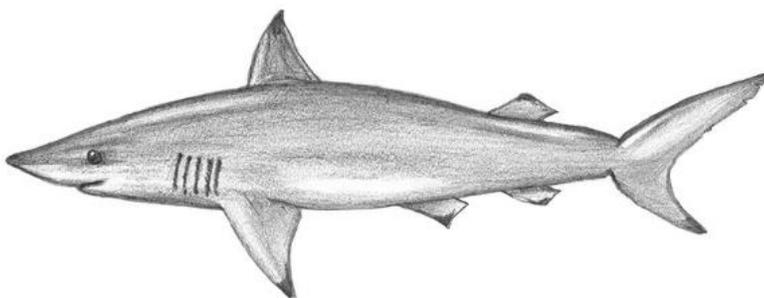
Groupers can be “eaten” by sharks if they get tagged by one. Their goal is to get food (flag) and make it back to the safe-zone

Lionfish



The Lionfish’s goal is to get food and make it back to the safe-zone, but you are not hunted by sharks (can’t be tagged)

Shark



The goal of the sharks is to “eat” (tag) as many Groupers as possible