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Format responses in **blue bold font**.

Student Exploration: Coral Reefs 2 – Biotic Factors

[This lesson was designed as a follow-up to the Coral Reefs 1 – Abiotic Factors lesson. Students should complete that activity before trying this one.]

Vocabulary (refer to vocab file located on the Gizmo site for definitions): biotic factor, black band disease, invasive species, white band disease

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)
In 1992, Hurricane Andrew left a wake of destruction through Florida. One victim of the storm was a reptile-breeding facility. Over 900 Burmese pythons were set free, and today thousands of pythons live in Florida. These pythons are an **invasive species**, or a harmful species not native to the region.




1. What impacts do you think the Burmese pythons might have on local ecosystems?
They'll disrupt the normal food chain
2. In general, why might ecologists be concerned when new invasive species arrive in an ecosystem?
It could cause another species to die off in the area

Gizmo Warm-up: Like terrestrial environments, coral reefs can be damaged by invasive species. Reefs are also impacted by disease-causing bacteria, humans, and other **biotic factors**, or living parts of the ecosystem. In the *Coral Reefs 2 – Biotic Factors* lesson, you will explore how these factors affect coral reefs.



1. On the CONDITIONS tab, select **Fishing**. Set **Net fishing** to 50%. Click **Advance year** 10 times. What changes do you notice on the **Coral reef** tab?
There is almost no fish life in the area
2. On the DATA tab, select every organism. What happens to the reef populations?
The long-spined sea urchin, algae, and sponge populations rise and everything else decreases

Activity A: Fishing regulation	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none">• Click Return to original settings and Restart.• On the CONDITIONS tab, check that Fishing is selected.	
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Introduction: Fishing is a major part of many Caribbean economies. The yellowtail snapper and Nassau grouper are important food fishes. However, a lack of adequate regulation has led to overfishing in many areas and consequent damage to reefs. The goals of this activity are to observe the effects of overfishing and determine how much fishing the reef can withstand.

Question: What are the effects of fishing on the reef ecosystem?

1. Describe: On the CORAL REEF tab, click on the stoplight parrotfish, queen angelfish, yellowtail snapper, and Nassau grouper. Describe what each of these fishes eat.

Stoptlight parrotfish: **Algae worms**

Yellowtail snapper: **Young fish, shrimp, crabs,**

Queen angelfish: **Sponges**

Nassau grouper: **snappers, angelfish, parrotfish**

2. Predict: Set **Grouper** to 70%. How do you think this level of fishing will affect the populations of the other fish in the simulated reef? Explain your reasoning. **I think it'll cause fish population to increase and everything else decreases**
3. Experiment: Select the DATA tab, and check that every species is selected. Click **Advance year** 10 times. Which fish populations increased, and which fish populations decreased?

Decrease: Nassau grouper, stoplight parrotfish, queen angelfish

Increase: yellowtail snapper, sponges,

4. Explain: Why do you think the snapper population changed the way it did? **I guess the groupers usually ate the yellowtails the most**
5. Predict: Click **Return to original settings** and **Restart**. Set **Snapper** to 70%. How do you think this will affect the other fish populations? Explain your reasoning. **The nassau grouper population will decrease and then the rest will follow from the grouper decrease**

(Activity A continued on next page)