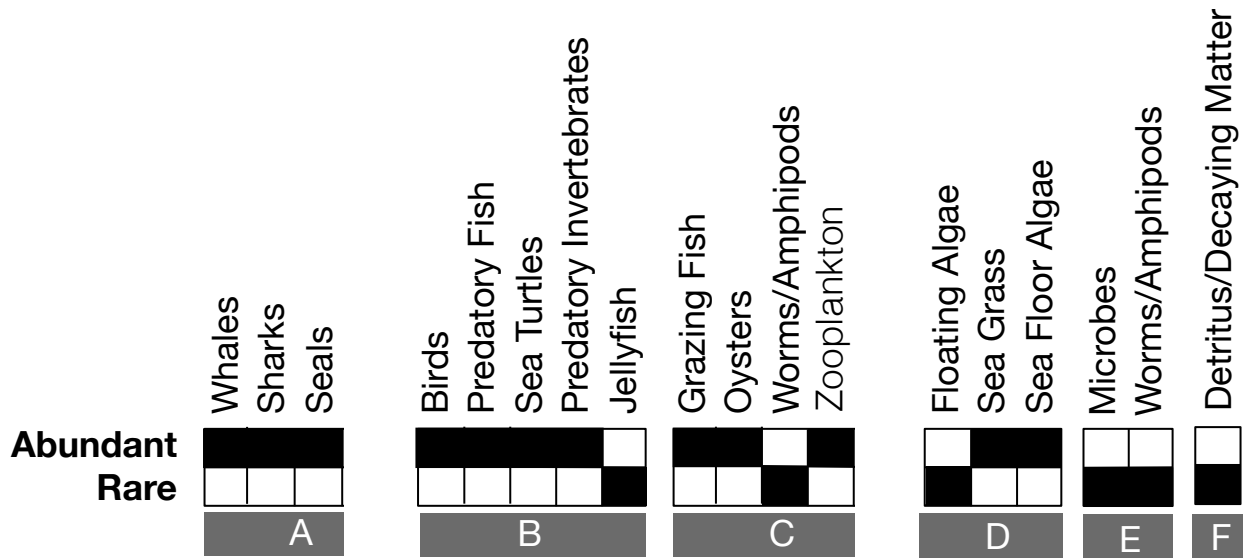


Name _____ Class: _____ Date: _____

Worksheet 2: Questions for Chesapeake Bay Food Web After Large-Scale Fishing

1. Now examine the food web *after* humans became part of the Chesapeake Bay ecosystem through fishing. Complete the same chart that you completed for the previous food web, and color or check which species groups are now rare or abundant.



2. Are more organisms rare or abundant after large-scale fishing? Which organisms are abundant?

Most organisms are rare now. The only abundant organisms are birds, jellyfish, worms/amphipods, floating algae, and microbes.



3. Are these the same organisms that were abundant in the pre-human food web?

No, most of the groups were rare in the previous food web. The only group that was abundant was the bird group. All of the other organisms were rare in the previous pre-human food web.

4. What happened to the top predators? Were they more or less affected than other trophic groups?

Yes, it looks like all the top predators were affected, although some of the lower trophic species have been badly affected too.

5. List how many species groups depend on each of the species groups listed at the top of this table. Count the number of strong and weak connections (arrows going to or from a species group) to complete the table below:

Connection	Sea Floor Plants	Predatory Fish	Grazing Fish	Floating Algae
Strong: 	Strong: 0	Strong: 1	Strong: 1	Strong: 1
Weak: 	Weak: 3	Weak: 7	Weak: 7	Weak: 1
Total:	Total: 0	Total: 8	Total: 7	Total: 2

6. In general, do these species groups have more connections or less after fishing?
They have the same number of interactions.

7. How does the strength of the interactions compare between this food web and the one before fishing?
Many interactions are weaker.

8. What does it mean for the ecosystem when most of the interactions are weak?
If means that the complexity of the ecosystem is reduced. There is a lot less going on in the ecosystem.

9. Redraw the food web including only the abundant species? What do you notice? (Note: some species may not have any connections at all)

The only part of the food web that can successfully be redrawn is the relationship amongst the detritus, microbes, floating algae, and worms/amphipods – the very low trophic levels. Higher trophic levels are not included. The complexity of the ecosystem has been lost. Also, people have been added to the ecosystem and jellyfish that were once rare are now abundant. Some species might not have any connections at all.

10. How is this food web similar/different to the food web without people?

Similar: Many of the same organisms are still there. They are just much diminished. Birds are common in both food webs. Different: Many common organisms are now rare like whales, sharks, seals, predatory fish, sea turtles, grazing fish, predatory invertebrates, zooplankton, oysters, sea floor algae and plants, sea grass. Jellyfish are now abundant. People have been added to the ecosystem.

11. Why do you think jellyfish are now abundant?

There are few sea turtles or whales to eat them.

12. Why are there fewer predatory fish if there are fewer whales, sharks & seals?

People are fishing them to eat too.

13. Which producers are now more common in this ecosystem, the floating algae or the sea floor algae and seagrass?

Floating algae are now more common in the ecosystem.

14. From what you know about the relationship between high levels of nutrients and algae growth, why have the floating algae increased?

High nutrient pollution (fertilizer) in run off from the land caused an increase in algae that live on the surface.

15. What happened to the sea floor algae and plants? If fewer organisms are eating them, shouldn't their numbers have increased? Why are they rare now? Hint: Like all plants, what do the sea floor algae and plants need to grow? How do more floating algae limit this important resource that sea floor algae and plants need? Explain.

Thick layers of floating algae block the sunlight from reaching the sea floor algae and plants that grow down below. Without sunlight the seafloor algae and plants cannot grow.

16. How does this food web connect to the present-day problem of high nutrient levels in the water? (Hint: Oysters filter the nutrients, microbes and floating algae from the water.) Use the food web to explain what happened to their numbers and why.

Oysters filter the water cleaning it of microbes, floating algae, and excess nutrients. People fished out the oysters taking away the Bay's natural filter. Without the filter, the Bay is now filled with excess nutrient levels, microbes, and floating algae that would have been consumed by the oysters.

17. Based on your answer to question seventeen make a hypothesis for how catching oysters affects floating algae levels?

Hypothesis:

If people overharvest the oysters, then floating algae would increase in the Bay. People overharvested the oysters leading to an increase of floating algae in the Bay.

18. What type of data would you need to collect in order to test your hypothesis?

Hint: You would need to compare historic and present day data on two elements of the ocean. What are those elements?

We would need to have historic and present-day data on the number of oysters and the level of floating algae in the Bay.