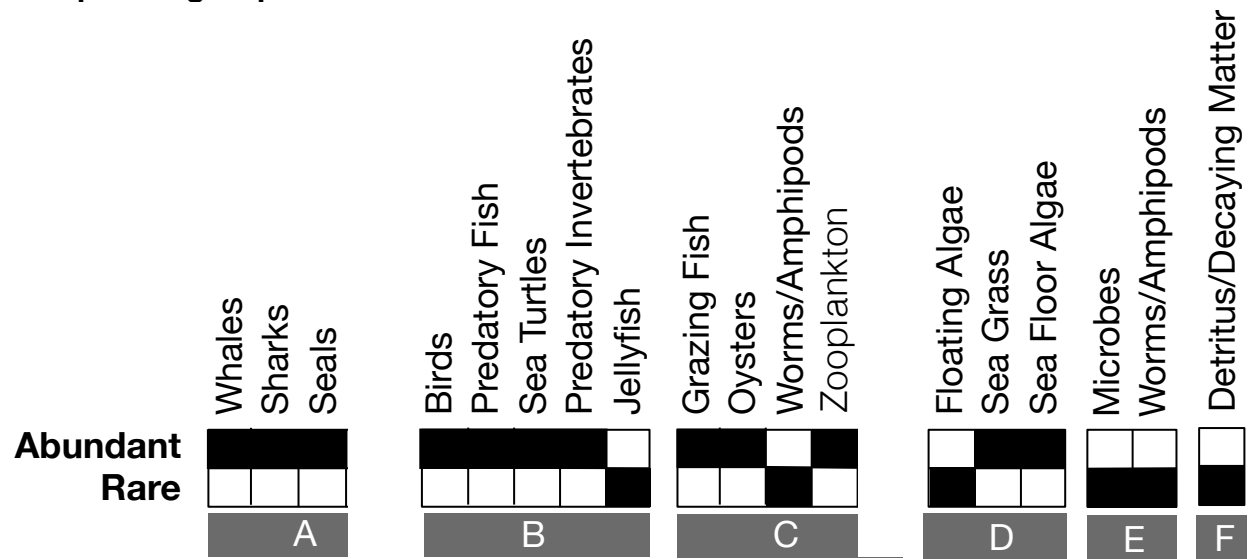


Name _____ Class: _____ Date: _____

Worksheet 1: Questions for Chesapeake Bay Food Web Before Large-scale Fishing

1. Examine the food web before humans fished in the Chesapeake. Notice which species groups are abundant (dark circles) and which species groups are rare (light circles). Color or check the squares on the chart below to indicate which species groups are rare or abundant.



2. Are most species abundant or rare? Which species groups are rare?

Most species are abundant. The only groups that are rare are jellyfish, worms/amphipods, floating algae, microbes, and detritus.

3. The species groups in the chart above are organized by trophic level. Write the name of the trophic group for groups A, B, C, D, and E. The trophic groups found in this ecosystem are decomposers, producers, consumers, secondary consumers, and top predators. Include a brief explanation of how each group interacts with other trophic levels.

A. Top Predators or Tertiary Consumers: These animals eat the primary and secondary consumers.

B. Secondary Predators: These animals eat mostly the primary consumers.

C. Primary Consumers: These animals eat the producers.

D. Producers: These organisms make their own food with energy from the sun.

E. Decomposers: These organism get their energy by consuming dead matter. Notice, that worms and amphipods are primary consumers and decomposers.

4A. How is it possible that the worms/amphipods are considered part of two groups?

The worms and amphipods eat decaying matter (detritus) and they also eat the seafloor plants.



4B. In which group are they more appropriately placed? Hint: Worms and amphipods cause rot on the plants that they eat.

Worms are most appropriately placed in the decomposer group. Although they eat plants, they primarily feed on detritus.

5. What is group F? What is the role of detritus in the food web?

Detritus or decaying matter provides nutrients to the base of the food web. These nutrients move up the food web.

6. List the number of strong and weak interactions for each of the species groups listed at the top of this chart. Count the number of strong and weak connections (arrows going to or from a species group) to complete the chart below:

Connection	Sea Floor Plants	Predatory Fish	Grazing Fish	Floating Algae
Strong: 	Strong: 1	Strong: 7	Strong: 6	Strong: 2
Weak: 	Weak: 1	Weak: 0	Weak: 1	Weak: 0
Total:	Total: 2	Total: 7	Total: 7	Total: 2

7. The producers can be organized based on where they are found in the water. Some float and some grow from the seabed. Which producers float and which producers grow from the sea bottom?

Floating algae float and seafloor algae, grasses, and plants are found on the bottom of the ocean.

8. In this ecosystem, which type of producers are more abundant, the producers that float or the producers that grow from the sea bottom?

It appears from the food web that the seafloor algae, plants and grasses are more abundant than the floating algae. However, the seafloor algae, plants and grasses and the floating algae group are about equally common as seen in the historic ratio levels shown in the upcoming graphing worksheet. The diagram identifies the floating algae as rare in comparison to its abundance in the ecosystem with fishing.

9. Find and write out a six-step food chain:

Floating algae → oyster → predatory invertebrates → predatory fish → Seal → Shark

10. Compare this food chain to a food chain that you find on land. How do they compare in length? Why do estuary food chains appear to be a different length than food chains on land?

Land food chains are not this long. There are two possible explanations: 1) The estuary ecosystem is extraordinarily productive because it receives nutrients from land and also is constantly recycling materials between the top ocean layer and the seafloor sediment. The high nutrient levels allow more plant life to flourish, which in turn allows the formation of food chains that would not be possible to support on land due to the loss of energy in the transfer of energy between trophic levels. 2) New evidence also points to another hypothesis for why estuary ecosystems have such long food chains, the ecosystem is large, allowing for new top-predators to be included in the ecosystem.

11. What do the microbes eat? Are they producers, consumers or decomposers?

Microbes eat the detritus and are therefore decomposers.

12. If whales and turtles become rare in this ecosystem, what would you expect to happen to the number of jellyfish?

The jellyfish population should go up because nothing else eats them.

13. If whales, sharks, seals and alligators were removed from the ecosystem, what would you expect to happen to the numbers of predatory fish?

Their populations should go up because nothing else, except birds, eats them.

14. If the oyster population was reduced, what would you expect to happen to the quantity of microbes, floating algae and detritus?

The microbes should increase because nothing else eats them. The floating algae should increase too, but may be held in check by the zooplankton that still eat them. If the floating algae increase then the detritus should also increase because now they have more food.