Marsh Energy Shifts

Trace how disruptions change energy pathways in a salt marsh food web.

8.12.A "explain how disruptions such as population changes, natural disasters, and human intervention impact the transfer of energy in food webs in ecosystems;"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each disruption in the passage, then draw an arrow from each disruption to the organisms whose energy supply changes. Circle the words that explain whether less energy reaches another feeding level.

Energy Under Pressure

1. At the edge of a coastal salt marsh, smooth cordgrass captures sunlight and stores energy in new leaves and stems. Periwinkle snails and grasshoppers eat the plants. Small fish eat insects and tiny animals in the water, while herons eat fish. When one organism eats another, only part of the food energy becomes energy for growth. Much is used in life processes and released as heat. Thus, less energy is available at each higher feeding level.

2. A sudden population change can redirect energy through this web. If periwinkle snails become unusually numerous, they consume more cordgrass. Less plant material then feeds grasshoppers and snails, so less energy can move to small fish and herons. The snail increase does not create extra energy. Instead, it shifts more of the marsh's limited plant energy into snails, while animals that depend on other pathways may have less food.

3. Natural disasters can interrupt several transfers at once. A hurricane's storm surge and waves can tear away cordgrass and erode marsh mud. With fewer living plants, snails and grasshoppers have less energy available from food, followed by less energy for fish and herons. Human actions can have a similar effect. When people dredge a boat channel, they remove marsh plants and change shallow-water habitat. Fewer producers and prey can reduce energy reaching consumers.

2 ANSWER WITH EVIDENCE

Use the passage

1 Why is less energy available at each higher feeding level in the marsh food web?

2 Explain how an unusually large periwinkle snail population could affect the energy available to herons.

3 How can a hurricane reduce energy transfer to fish and herons in this marsh?

4 How does dredging a boat channel affect the transfer of energy in the food web?

3 YOUR TURN

Your own words

Choose a pond, forest, or grassland food web. Write 3 or 4 sentences explaining how one human action, natural disaster, or population change affects energy transfer through at least three feeding links.

ANSWER KEY

Marsh Energy Shifts

GRADE 8 · TEKS 8.12.A

PART 1 · READ AND MARK

Underline each disruption in the passage, then draw an arrow from each disruption to the organisms whose energy supply changes. Circle the words that explain whether less energy reaches another feeding level. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Why is less energy available at each higher feeding level in the marsh food web?	**Only part of the energy in food becomes energy for growth. Much is used in life processes and released as heat.**
2	Explain how an unusually large periwinkle snail population could affect the energy available to herons.	**More snails eat more cordgrass, leaving less plant material for other organisms. Less energy can then move through prey to small fish and herons.**
3	How can a hurricane reduce energy transfer to fish and herons in this marsh?	**Storm surge and waves can remove cordgrass. With fewer plants, snails and grasshoppers have less food energy, so less energy can reach fish and herons.**
4	How does dredging a boat channel affect the transfer of energy in the food web?	**Dredging removes marsh plants and changes shallow-water habitat. Fewer producers and prey mean less energy can reach consumers.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

In a pond, pesticide runoff lowers the number of aquatic insects. Fewer insects transfer less algae energy to minnows, so bass receive less energy when they eat minnows. Algae may grow more because fewer insects feed on it, but the disrupted pathway leaves less energy for fish-eating herons.

Accept any accurate food web with a clearly identified disruption and a logical chain showing how the amount or path of energy changes. Students should include at least three feeding links and should not claim that a disruption creates energy.