# tpo_22_passage_3

Spartina alterniflora, known as cordgrass, is a deciduous, perennial flowering plant native to the Atlantic coast and the Gulf Coast of the United States. It is the dominant native species of the lower salt marshes along these coasts, where it grows in the intertidal zone (the area covered by water some parts of the day and exposed others). These natural salt marshes are among the most productive habitats in the marine environment.  Nutrient-rich water is brought to the wetlands during each high tide, making a high rate of food production possible. As the seaweed and marsh grass leaves die, bacteria break down the plant material, and insects, small shrimplike organisms, fiddler crabs, and marsh snails eat the decaying plant tissue, digest it, and excrete wastes high in nutrients. Numerous insects occupy the marsh, feeding on living or dead cordgrass tissue, and redwing blackbirds, sparrows, rodents, rabbits, and deer feed directly on the cordgrass.  Each tidal cycle carries plant material into the offshore water to be used by the subtidal organisms. Spartina is an exceedingly competitive plant. It spreads primarily by underground stems; colonies form when pieces of the root system or whole plants float into an area and take root or when seeds float into a suitable area and germinate. Spartina establishes itself on substrates ranging from sand and silt to gravel and cobble and is tolerant of salinities ranging from that of near freshwater (0.05 percent) to that of salt water (3.5 percent). Because they lack oxygen, marsh sediments are high in sulfides that are toxic to most plants. Spartina has the ability to take up sulfides and convert them to sulfate, a form of sulfur that the plant can use; this ability makes it easier for the grass to colonize marsh environments. Another adaptive advantage is Spartina`s ability to use carbon dioxide more efficiently than most other plants. These characteristics make Spartina a valuable component of the estuaries where it occurs naturally. The plant functions as a stabilizer and a sediment trap and as a nursery area for estuarine fish and shellfish. Once established, a stand of Spartina begins to trap sediment, changing the substrate elevation, and eventually the stand evolves into a high marsh system where Spartina is gradually displaced by higher-elevation, brackish-water species. As elevation increases, narrow, deep channels of water form throughout the marsh. Along the east coast Spartina is considered valuable for its ability to prevent erosion and marshland deterioration; it is also used for coastal restoration projects and the creation of new wetland sites. Spartina was transported to Washington State in packing materials for oysters transplanted from the east coast in 1894. Leaving its insect predators behind, the cordgrass has been spreading slowly and steadily along Washington`s tidal estuaries on the west coast, crowding out the native plants and drastically altering the landscape by trapping sediment. Spartina modifies tidal mudflats, turning them into high marshes inhospitable to the many fish and waterfowl that depend on the mudflats. It is already hampering the oyster harvest and the Dungeness crab fishery, and it interferes with the recreational use of beaches and waterfronts. Spartina has been transplanted to England and to New Zealand for land reclamation and shoreline stabilization. In New Zealand the plant has spread rapidly, changing mudflats with marshy fringes to extensive salt meadows and reducing the number and kinds of birds and animals that use the marsh. Efforts to control Spartina outside its natural environment have included burning, flooding, shadingplants with black canvas or plastic, smothering the plants with dredged materials or clay, applying herbicide, and mowing repeatedly. Little success has been reported in New Zealand and England; Washington State`s management program has tried many of these methods and is presently using

the herbicide glyphosphate to control its spread. Work has begun to determine the feasibility of using insects as biological controls, but effective biological controls are considered years away. Even with a massive effort, it is doubtful that complete eradication of Spartina from nonnative habitats is possible, for it has become an integral part of these shorelines and estuaries during the last 100 to 200 years.

question 1

According to paragraph 1, each of the following is true of Spartina alterniflora EXCEPT:

A It rarely flowers in salt marshes.

B It grows well in intertidal zones.

C It is commonly referred to as "cordgrass."

D It occurs naturally along the Gulf Coast and the Atlantic coast of the United States.

question 2

According to paragraph 2, a major reason why natural salt marshes are so productive is that they are

A inhabited by long-lived seaweed and marsh grasses that reproduce gradually

B kept clear of excess plant material by the tides

C regularly supplied with high levels of nutrients

D home to a wide variety of different species of grasses

question 3

Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

A Insects feed only on dead cordgrass, while most other marsh inhabitants feed on live cordgrass.

B The marsh is a good habitat for insects, but a relatively poor one for birds and animals.

C Although cordgrass provides food for birds and animals, it gives insects both food and a place to live.

D Cordgrass provides food for numerous insects, birds, and other animals.

question 4

What is the organizational structure of paragraph 3?

A It makes a general claim about Spartina and then provides specific evidence to defend that claim against objections to the claim.

B It presents a general characterization of Spartina and then describes particular features on which this characterization is based.

C It reports a widely held view about Spartina and then considers evidence both for and against that view.

D It presents a general hypothesis about Spartina and then lists specific evidence that disputes that hypothesis.

question 5

According to paragraph 3, one reason that Spartina is able to compete in marsh environments so successfully is its ability to

A alter the substrate in which it grows

B convert sulfides into a usable form of sulfur

C grow and produce seeds while floating on the surface of the water

D produce carbon dioxide with great efficiency

question 6

Paragraph 4 suggests that where Spartina occurs naturally, an established stand of it will eventually

A create conditions in which it can no longer survive

B get washed away by water flowing through the deep channels that form around it

C become adapted to brackish water

D take over other grass species growing in the area

question 7

According to paragraph 4, in its natural habitats, Spartina helps estuaries by

A controlling marshland decline

B decreasing the substrate elevation

C reducing the brackishness of the water

D increasing the flow of water into the estuary

question 8

The word “modifies” in the passage is closest in meaning to

A creates

B changes

C grows on

D breaks down

question 9

According to paragraph 5, Spartina negatively affects wildlife in estuaries by

A trapping fish and waterfowl in sediment

B preventing oysters from transplanting successfully

C turning mudflats into high marshes and salt meadows

D expanding the marshy fringes of salt meadows

question 10

Look at the four squares [ ] that indicate where the following sentence could be added to the passage.

Spartina alterniflora, known as cordgrass, is a deciduous, perennial flowering plant native to the Atlantic coast and the Gulf Coast of the United States. It is the dominant native species of the lower salt marshes along these coasts, where it grows in the intertidal zone (the area covered by water some parts of the day and exposed others). These natural salt marshes are among the most productive habitats in the marine environment. Nutrient-rich water is brought to the wetlands during each high tide, making a high rate of food production possible. As the seaweed and marsh grass leaves die, bacteria break down the plant material, and insects, small shrimplike organisms, fiddler crabs, and marsh snails eat the decaying plant tissue, digest it, and excrete wastes high in nutrients. Numerous insects occupy the marsh, feeding on living or dead cordgrass tissue, and redwing blackbirds, sparrows, rodents, rabbits, and deer feed directly on the cordgrass. Each tidal cycle carries plant material into the offshore water to be used by the subtidal organisms. Spartina is an exceedingly competitive plant. [] It spreads primarily by underground stems; colonies form when pieces of the root system or whole plants float into an area and take root or when seeds float into a suitable area and germinate. [] Spartina establishes itself on substrates ranging from sand and silt to gravel and cobble and is tolerant of salinities ranging from that of near freshwater (0.05 percent) to that of salt water (3.5 percent). [] Because they lack oxygen, marsh sediments are high in sulfides that are toxic to most plants. [] Spartina has the ability to take up sulfides and convert them to sulfate, a form of sulfur that the plant can use; this ability makes it easier for the grass to colonize marsh environments. Another adaptive advantage is Spartina`s ability to use carbon dioxide more efficiently than most other plants. These characteristics make Spartina a valuable component of the estuaries where it occurs naturally. The plant functions as a stabilizer and a sediment trap and as a nursery area for estuarine fish and shellfish. Once established, a stand of Spartina begins to trap sediment, changing the substrate elevation, and eventually the stand evolves into a high marsh system where Spartina is gradually displaced by higher-elevation, brackish-water species. As elevation increases, narrow, deep channels of water form throughout the marsh. Along the east coast Spartina is considered valuable for its ability to prevent erosion and marshland deterioration; it is also used for coastal restoration projects and the creation of new wetland sites. Spartina was transported to Washington State in packing materials for oysters transplanted from the east coast in 1894. Leaving its insect predators behind, the cordgrass has been spreading slowly and steadily along Washington`s tidal estuaries on the west coast, crowding out the native plants and drastically altering the landscape by trapping sediment. Spartina modifies tidal mudflats, turning them into high marshes inhospitable to the many fish and waterfowl that depend on the mudflats. It is already hampering the oyster harvest and the Dungeness crab fishery, and it interferes with the recreational use of beaches and waterfronts. Spartina has been transplanted to England and to New Zealand for land

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