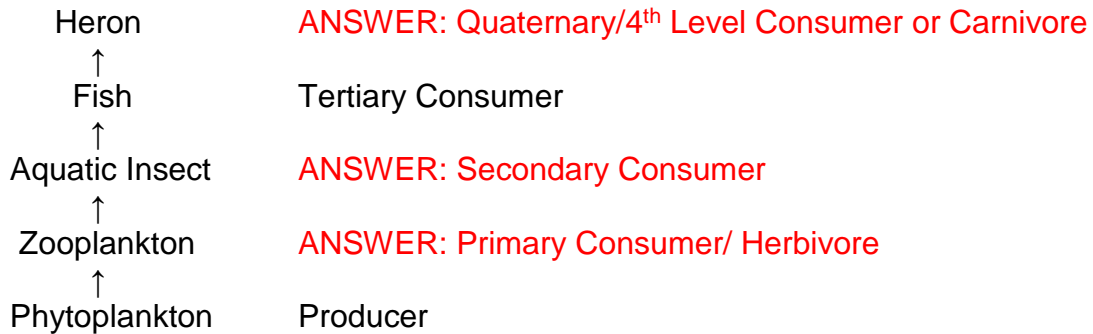


Station 2

W1. Outlined below is one type of food-chain relationship that exists in Horsepen Bayou. Which trophic group does each organism in the food chain belong to? Based on the pyramid of numbers and biomass theory, which trophic group should contain the greatest number of individuals and have the greatest biomass?



4 points **ANSWER: Phytoplankton (Producer) should contain the greatest number of individuals and biomass based on the pyramid of numbers and biomass theory.**

W2. Look at the tracks under the bridge marked A, and B. Give the common name of the animals that made them.

2 points **ANSWER: A: TBD**
B: TBD
(deer, raccoon, opossum, coyote, human)

W3. Look at the shell and eggs on the table marked "W4". They are from an exotic and invasive species of mollusk that has been found in this bayou. Give the common name of this species.

1 point **ANSWER: Apple snail**

W4. Why do birds migrate? Give one (1) reason.

1 point **ANSWER: Birds often migrate to areas where food is abundant or available, the climate is relatively mild, there is less competition for nesting sites, and daylight hours are longer.**

8 total points

Station 2

S1. Using the soil map provided and the Harris County Soil Survey, what is the soil map unit (map unit symbol and map unit name) of this site?

2 points

ANSWER: VaB Vamont clay, 1 to 4 percent slopes

S2. Using your ANSWER to the question above, along with the Harris County Soil Survey, what is the drainage class of the soil map unit at this site?

1 point

ANSWER: Somewhat poorly drained (page 22)

S3. Using your ANSWER to the question above, along with the Harris County Soil Survey, what is the permeability of the soil map unit of this site?

1 point

ANSWER: Very slow (page 22)

S4. Using your ANSWER from question #1 above, along with the Harris County Soil Survey, what is the Limitation for Pond Reservoir Areas of the soil map unit of this site? Does this rating mean a pond will likely hold water?

2 points

ANSWER: Slight (page 103, table 12); Yes

S5. What is the material hanging in the tree limbs here referred to as? How did it get here?



2 points

ANSWER: Drift or flood debris; from a flood event (flooding).

8 total points

Station 2

- F1. What is the dominant understory brush species, labeled F1, in this wooded area? Is it invasive or non-invasive? Is it native or non-native? What course of action could be recommended for this wooded area?

4 points

ANSWER: Chinese Privet (*Ligustrum sinense*), it is highly invasive and non-native; originally from China in mid-1800's, it can completely take over a site if allowed, especially bottomlands. Spot treatment with herbicides will eliminate it, controlled burning is another option.

- F2. Identify the common name of the tree labeled F2. What are the benefits, if any, that this tree provides for wildlife? What is the dbh of this tree?

3 points

ANSWER: Water Oak (*Quercus nigra*). As with all oaks, this tree produces a crop of acorns that are an important source of protein to a variety of wildlife species. DBH - TBD.

- F3. Assume that the forest extends to the edge of the bayou and is functioning as a Streamside Management Zone (SMZ). What is the minimum width required for a proper SMZ? What would be the minimum recommended Basal Area with this SMZ? What is Basal Area and how is it usually measured?

4 points

ANSWER: The minimum recommended width for a SMZ is 50'. The minimum recommended Basal Area is 50 sq. ft. for any SMZ. Basal area is the sum total of the cross sectional area of all trees present on an acre of land measured at dbh. Basal area is usually determined using a prism on variable radius plots.

- F4. Name two (2) important natural resources that are conserved and protected by respecting Streamside Management Zones.

2 points

ANSWER: Soil -by preventing erosion. Water - preserving quality by preventing soil erosion, Wildlife habitat - is conserved by not cutting critical trees.

- F5. Identify the tree labelled F5. Is this a native species?

2 points

ANSWER: Chinese Tallow tree. Non-native, highly invasive.

15 total points

Station 2

- CI 1. Describe two (2) reasons for the shift in agriculture from small family farms to the use of a mono-crop culture in US agriculture.

2 points

ANSWER: The technologies allowing the shift toward monoculture were mechanization, the improvement of crop varieties, and the development of agrochemicals to fertilize crops and control weeds and pests. Government commodity policies these past several decades encouraged the acceptance and utilization of these technologies. After WWII, the petrochemical industry had many times ability to produce chemicals than needed and found the chemicals would be modified to kill pests in agricultural production. In turn, lack of rotations and diversification took away key self-regulating mechanisms, turning monocultures into highly profitable systems dependent on high chemical inputs. Monoculture production rewards economies of scale. Recent subsidies for ethanol production as well.

- CI 2. What are the two (2) main agriculture crops that are grown primarily as a monoculture and are used extensively in the foods we consume?

2 points

ANSWER: corn and soybeans

- CI 3. Describe one (1) potential problem with growing agriculture crops as a monoculture.

1 point

ANSWER: creates an ideal environment for pest outbreaks when crops are genetically uniform, no plant diversity to allow diverse insect populations, etc.

- CI 4. What is meant by the term “food miles”? Describe one (1) way mono-crop production practices contribute to food miles.

2 points

ANSWER: “Food miles” refers to the distance food travels from where it is produced to the final consumers. As growers planted more mono-crop rotations they found fewer markets for minor crops in the local infrastructure. Because less livestock feed and forage was in the rotation, fewer market livestock were produced and the accompanying infrastructure disappeared. Without markets and infrastructure, those growers who wanted to produce were not able to produce at profitable levels. In addition, the farm bills promoted production of commodity crops, namely field corn, wheat and soybeans at the expense of specialty crops (fruits, vegetables and nuts). Without local production, market livestock finishing was concentrated along with slaughter facilities and the finished products transported to consumers. Similarly, vegetable and fruit production and processing concentrated and home-gardeners found it cheaper to purchase commercial products.

- CI 5. Describe the difference in a 17th century city as compared to a 20th century city when thinking about “how do we feed a city?” Taking into account both livestock and produce.

1 point

ANSWER: In 17th century cities, the food was “walked” into the city, sold in the city, most likely slaughtered in the city, cooked and consumed in the city. Food was a central part of the city markets and was central to shaping the city. After the invention of the train, and later automobile, food is far removed from the city—food is purchased in a box store, and generally slaughtered and grown far from its final destination.

8 points total

Station 2

A1. This Bayou is a Tidal Waterbody. If you took a water sample from the surface and from the bottom water of the bayou,

A) Which sample would you expect to have the highest conductivity? Why?

2 points

ANSWER: A) Bottom, fresh water is less dense, salt water is denser and found on the bottom

B) Which sample would you expect to have the highest dissolved oxygen? Why?

2 points

ANSWER: B) Surface, because of the air water interface (photic zone is on top), also has to do with the layering of the tidal water body causing limited mixing.

A2. What is a salt wedge and what ecological impacts does it have?

2 points

ANSWER: Salt wedge estuaries occur when the mouth of a river flows directly into salt water. The circulation is controlled by the river that pushes back the seawater. This creates a sharp boundary that separates an upper less salty layer from an intruding wedge-shaped salty bottom layer. Ecological impacts include impacts on sedentary biota because of reduced vertical mixing suspended solids fall-out, decrease flow/velocity,

A3. Describe one (1) sign that a waterbody is experiencing eutrophication.

1 point

ANSWER: Large amounts of phytoplankton suspended in the water. The dense phytoplankton blooms are caused by high nutrient loads, specifically nitrogen and phosphorous, carried into the Bayou with stormwater runoff, treated and untreated sewage effluent. Fish kills, excessively low dissolved oxygen, etc.

A4. List two (2) invasive plant species that impact freshwater bodies in Texas.

2 points

ANSWER: Water Hyacinth, Water Lettuce, Hydrilla, Giant Salvinia, Giant or Dotted Duckweed, Watermilfoil, Alligatorweed, Paperbark, Torpedograss, Water Spinach, Duck Lettuce

9 points total