Team Name _____

Station 5

A1. Using the dichotomous key provided, key out fish specimen A to the correct Order. Remember, preserved fish may not retain the coloration of live specimens.

2 points

Order:_____Atheriniformes_____

A2. List two (2) negative impacts of aquaculture on the environment.

2 points

ANSWER: Eutrophication, habitat destruction/loss, accidental introduction of alien species, use of wild stock fish for feed, pollution of chemicals and antibiotics

A3. Explain how a closed loop or recirculating system can decrease the environmental impacts of an aquaculture facility.

1 point

ANSWER: Closed loop systems reduce water needs, reduces outfall pollution of the facility, and the recirculated waste can be used to create energy.

A4. According to the Food and Agriculture Organization of the United Nations, what country is the top producer of farmed aquatic animals?

1 point

ANSWER: China

A5. What is the difference between point source and non-point source pollution, and give one (1) example of each.

Point Source Pollution and Example:

ANSWER: The term "point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft from which pollutants are or may be discharged.

4 points

Non-point Source Pollution and Example:

ANSWER: Nonpoint source pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, excess fertilizers, herbicides and insecticides from agricultural lands and residential areas. Oil, grease and toxic chemicals from urban runoff and/or energy production. Sediment from improperly managed construction sites, crop and forest lands, and eroding streambanks. Salt from irrigation practices and acid drainage from abandoned mines. Bacteria and nutrients from livestock, pet wastes and faulty septic systems. Atmospheric deposition and hydromodification.

10 total points

Team Name: _____

Station 5

CI 1. While some plants depend on wind or water to transfer pollen, approximately 90 percent require an animal to accomplish the task. Name two (2) vertebrate animals and one (1) invertebrate animal (other than bees) that transfer pollen in Texas.

3 points

ANSWER: In Texas birds, bats, and small mammals, and invertebrates, including flies, beetles, butterflies, and moths help in pollination.

CI 2. Describe two (2) advantages of including native plants in landscaping design.

2 points

ANSWER: Use less water, food for native animals, more resistant to pests, more resilient growers.

CI 3. Identify one (1) of the fruit trees growing at this site.

1 point

ANSWER: Fig, persimmon, lemon, orange or citrus accepted

CI 4. Describe two (2) advantages and one (1) disadvantage of having edible tree products in urban forests?

3 points

ANSWER: The advantages: providing a source of local food for nearby residents and visitors, enhancing the attractiveness of urban forests for visitation, and creating educational opportunities for school children. Disadvantages include: overproduction and under harvest of fruits, creating a problem with falling and rotten fruit that can attract wasps, rodents, and wildlife and create an unpleasant situation; confusion of edible and inedible tree products by visitors; and the need for active arborist involvement to ensure continued fruit production through pruning, pest control, and weed management.

CI 5. How could the Purple Martins located here contribute to agricultural production in this local area?

1 point

ANSWER: The birds eat pests that might otherwise eat the agriculture produce.

CI 6. Describe two (2) benefits to having a rain garden and cistern at this site.

2 points

ANSWER: The cistern collects the rain water from the roof and holds it until needed for watering plants. The rain garden stores water, prevents flooding and increases infiltration, and allows excess water to drain slowly rather than leaving the site in large quantities.

12 total points

Team Name:_____

Station 5

F1. Identify the tree labeled F1. What type of habitat is this tree usually found in?

2 points ANSWER: River Birch (*Betula nigra*) usually found along creeks and rivers.

F2. Identify the tree F2. What important historical use did this tree have?

2 points ANSWER: Live Oak (*Quercus virginiana*) was used extensively for ship building in the days of wooden sailing vessels; example is the USS Constitution or “Old Ironsides”.

F3. Locate the log labeled F3. How old was the tree this log came from? What is the feature with the arrow pointing toward it and what caused it to form?

2 points ANSWER: This is a pine log from a tree that was about 36 years old. The feature with the arrow is a knot which was caused by a branch.

F4. On the log labeled F3, what type of wood is contained in the area within the circle? Outside of the circle?

Inside the Circle:

Outside the Circle:

2 points ANSWER: The wood in the circle is heartwood, outside the circle is sapwood.

F5. If this log labeled F3 were a living tree, how would you determine its age?

1 point ANSWER: By using an increment borer.

9 total points

Team Name: _____

Station 5

S1. Name one (1) item that plants receive from the soil.

1 point ANSWER: Nutrients, water, oxygen, physical support

S2. The plant marked with the S2 flagging is more suited to a soil pH of 5.1 to 6.0. Is this acidic, basic, or a neutral pH?

1 point ANSWER: Acidic

S3. Adding lime will cause soil pH to _____.

1 point ANSWER: Increase (rise or other synonym)

S4. A strongly acid soil typically has lower levels of which nutrients available for plants. Name two (2) of these nutrients.

2 points ANSWER: Nitrogen, Phosphorus, Calcium, Magnesium, Potassium, Sulfur

S5. What is the difference between water infiltration and permeability (or percolation)?

2 points ANSWER: Water infiltration is water movement into the soil surface; water percolation is water movement through the subsoil.

S6. Soil compaction will typically _____ water runoff and soil erosion.

1 point ANSWER: Increase (or synonym)

S7. Intensive tillage, soil erosion and insufficient crop or plant residue leads to _____ soil organic matter.

1 point ANSWER: Decreased

S8. Grapefruit and lemon trees typically grow in a _____ temperature regime.

1 point A) Hyperthermic B) Thermic C) Mesic D) Cryic

S9. The best way to prevent soil erosion is to provide plenty of cover to protect the soil from wind and rain. Give two (2) specific examples of how this can be done.

2 points ANSWER: Plant winter cover crops, prevent overgrazing, interseeding, protecting surface with crop residue, SMZs.

12 total points

Team Name: _____

Station 5

W1. ANSWER with true or false for each statement. The Migratory Bird Treaty Act (MBTA) prohibits the following acts, without a permit or license:

a. Collecting a feather that belongs to a bird protected by the MTBA.
2 points ANSWER: True

b. The house sparrow is a non-native bird species whose occurrence in the U.S. is the result of intentional introduction. This species is not protected by the MBTA. ANSWER: True

W2. Look at the photograph of butterflies on the table.

a. Give the common name of this species and the common name of its host
2 points plant.

ANSWER: Monarch butterfly: Milkweed

b. Give two (2) reasons for the decline in the population of this species.

2 points ANSWER: habitat loss leading to decrease in milkweed available, pesticide use, loss of overwintering habitat.

W3. What mammal would you expect to find here on campus that has a bony carapace and hair that is almost entirely absent on the upper body?

1 point ANSWER: Armadillo

W4. Describe one (1) positive and one (1) negative aspect to having an active bee hive in a demonstration garden similar to this site.

2 points ANSWER: Great pollinators, and honey – someone might be stung as we have people near the building.

W5. Every spring, Neotropical migrant birds often “stopover” in forested areas along the Texas coast for short periods of time before continuing their journey to breeding grounds in the Northern U.S. and Canada. Why do Neotropical migrants stopover in such areas during their migration? How might the loss of stopover habitat along the Texas coast affect Neotropical migrant birds?

2 points ANSWER: During migration, Neotropical migrants often “stopover” in forested areas to rest, forage/refuel, and avoid bad weather. Loss of stopover habitat can result in birds not obtaining enough energy to survive migration. Birds may also compete for limited stopover sites or be forced to use poor quality stopover areas causing them to arrive at breeding grounds in poor condition, which may affect reproductive success and/or survival. Ultimately, the loss of *stopover habitat along the Texas coast can adversely affect the survival of Neotropical migrating birds.*

11 total points