

CT Envirothon Aquatics Exam 2015

Print the name of your Team/School on the line in the upper right hand corner of this page and **EACH** additional page. For each of the questions in this exam you will either circle the correct answer or fill in the blank space(s) provided.

All specimen identifications are included in the first half of the exam and you are allowed to use the provided keys to ID each organism. There are two questions per specimen and each specimen identification question number correlates to the specimen # (e.g. 1A and 1B). Each question from #1A-#22 is worth 3 points, the bonus question #23 is worth 1 point each. Questions #24- #28 are focused on the current topic and worth 2 points each. **GOOD LUCK!!!**

Please utilize the *Key to Saltwater Invertebrates* to identify the following organisms:

1A) Identify the species in container #1.

- a) *Hemigrapsus sanguineus*
- b) *Carcinus maenas*
- c) ***Homarus americanus***
- d) *Callinectes sapidus*

1B) Is the specimen in container #1 considered a native or invasive species to Long Island Sound?

- a) **native**
- b) invasive

2A) Identify the species in container #2.

- a) ***Crepidula fornicata***
- b) *Nucella lapillus*
- c) *Argopecten irradians*
- d) *Mercenaria mercenaria*

2B) What feeding strategy does species in container #2 display?

- a) grazing
- b) active predation
- c) burrowing
- d) **suspension feeding**

Use *The Amphibians of Connecticut* to identify the following organisms:

3A) Identify the species in container #3.

- a) *Plethodon cinereus*
- b) ***Ambystoma maculatum***
- c) *Desmognathus fuscus*
- d) *Eurycea bislineata*

3B) The species in container #3 require is a key indicator of what habitat conditions?

- a) a stream
- b) the ocean
- c) a vernal pool
- d) terrestrial

4A) What is the species in container #4?

- a) *Pseudacris crucifer*
- b) *Rana clamitans*
- c) *Rana sylvatica*
- d) *Hyla versicolor*

4B) What is the primary food source for the adult form of the species in container #4?

- a) fish
- b) insects and other invertebrates
- c) tadpoles
- d) all of the above

5A) What is the species in container #5?

- a) *Plethodon glutinosus*
- b) *Ambystoma laterale*
- c) *Notophthalmus viridescens*
- d) *Ambystoma maculatum*

5B) Adult forms of the species in container #5 live in what conditions?

- b) terrestrial
- b) aquatic

Use the *Connecticut Fish Key* to identify the following organisms:

6A) What species is in container #6?

- a) *Apeltes quadracus*
- b) *Anguilla rostrata*
- c) *Esox americanus*
- d) *Lepomis macrochirus*

6B) What type or reproductive migration does the fish in container #6 display?

- a) catadromous
- b) anadromous
- c) amphidromous
- d) potamodromous

7A) What species is in container #7?

- a) *Pseudopleuronectes americanus* b) *Fundulus* sp.
c) *Apeltes quadracus* d) *Catostomus commersoni*

7B) What type of scales does the fish in container #7 have?

- a) placoid b) ganoid
c) cycloid d) lacks scales

Use the *Freshwater Mussels of CT Guide* for the following shell:

8A) What species is in container #8?

- a) *Anodonta imbecilis* b) *Elliptio complanata*
c) *Lampsilis cariosa* d) *Strophitus undulatus*

8B) Is the species in container #8 protected through the State of Connecticut's Endangered and Threatened Species laws?

- a) No, it is common. b) Yes, it is endangered.
c) Yes, it is threatened. c) Yes, it is extinct in the wild

Use the *Guide to Riffle Dwelling Macroinvertebrates* for the following organisms:

9A) What is the family in vial # 9?

- a) *Perlodidae* b) *Gastropoda*
c) *Hydropsychidae* d) *Elimidae*

9B) What type of feeding group does the specimen in vial # 9 belong to?

- a) scraper b) collector-filterer
c) predator d) gatherer

10A) What is the family in vial #10?

- a) *Caenidae* b) *Aeshnidae*

c) *Aracnida*

d) *Amphipoda*

10B) What the pollution tolerance value for the family in vial #10?

a) 3

b) 5

c) 1

d) 7

Use the *Invasive Aquatic Plants in CT Guide* for the following plant:

11A) What is the plant in photo #11?

a) *Megalodonta beckii*

b) *Najas minor*

c) *Hydrilla verticillata*

d) *Cabomba caroliniana*

11B) Similar to many invasive aquatic plants, what is likely origin of the species in photo #11 introduced to Connecticut?

a) Use by the aquarium and water garden industries

b) Food items shipped to the USA

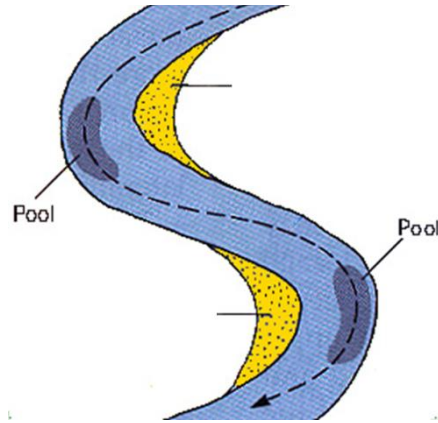
c) Fish stocking

d) Transported via ship ballasts over seas

For the remaining questions on the exam, no ID guides or other reference materials may be used, unless indicated. All questions come directly from the workshop training session including many of the materials posted on the CT Envirothon website and are referenced for your future learning. Please ask station leaders if you have any specific questions as you work through the exam.

The following six questions are based on the “Watershed Jeopardy” session during the Aquatics 2015 Workshop.

12) The area colored in yellow:



a) What is a point bar?

b) What is an island?

c) What is a pool?

d) What is a sink hole?

13) NTUs are unit for measuring this:

a) What is temperature?

b) What is pH?

c) What is turbidity?

d) What is salinity?

14) Status of a nutrient poor lake?

a) What is the eutrophic?

b) What is the oligotrophic?

c) What is the undertrophic?

d) What is the epitrophic?

15) This is the fraction of voids over the total volume of a soil sample:

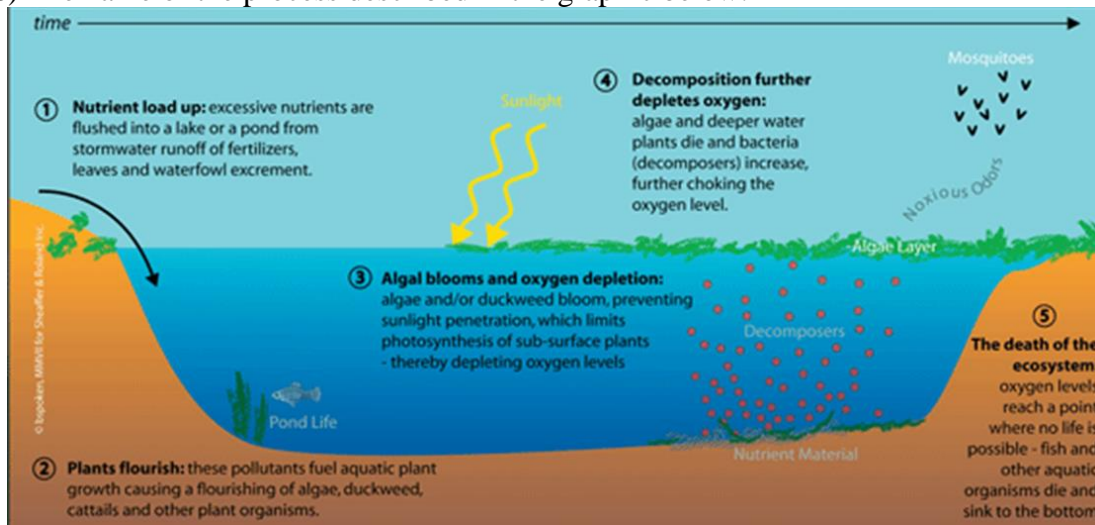
a) What is porosity?

b) What is salinity?

c) What is compaction?

d) What is volume?

16) The name of the process described in the graphic below:



- a) colonization
- b) eutrophication
- c) the water cycle
- d) deposition

17) This is used to measure groundwater head:



- a) What is a well?
- b) What is a groundwater gauge?
- c) What is a piezometer?
- d) What is a measuring stick?

The following five questions are based on the “Nonpoint Source Pollution: A Challenge to Control” session during the Aquatics 2015 Workshop.

18) Which of the following is Connecticut’s **primary cause of non-point source pollution**?

- a) piped discharge for industrial plants
- b) agricultural runoff
- c) urban stormwater runoff
- d) runoff from construction sites

19) What is **NOT** an example of the problems caused by sediment discharging into waterways?

- a) decreases turbidity
- b) clogs fish gills
- c) covers benthic layers
- d) carries other pollutants

20) Problems of habitat degradation as a result of harmful algal blooms and hypoxia are primarily due to this form of non-point source pollution:

- a) Pathogens
- b) Toxins
- c) Floatable debris
- d) Nutrients – nitrogen and phosphorus

21) The Clean Water Act of 1972 required permitting for which type of pollutants?

- a) Non-point Source
- b) Point Source

22) Which are factors that can influence erosion?

- a) rainfall/runoff amount and intensity
- b) amount of vegetation
- c) size of drainage area
- d) All of the above

23) ****BONUS**** What is your team’s favorite aquatic organism?
(ANY answer receives 1 point)

The following questions on the exam are directly focused on the Current Topic for 2014 “Urban Forestry.” For the purpose of the Aquatics Focus, the questions target the role Urban Forestry plays in stormwater treatment, and are taken primarily from the USEPA “Stormwater to Street Trees” publication (USEPA 2013). These questions are worth 2 points each. Please ask station leaders if you have any specific questions. (Current Issue: List of Resources document)

- 24) Which contaminants are components of urban stormwater runoff?
- a) Soil from construction sites and other bare ground
 - b) Oil, grease, metals, and coolants from vehicles
 - c) Fertilizers, pesticides, and other chemicals from farms, gardens, and homes
 - d) All of the above
- 25) What is the process by which trees take up trace amounts of harmful chemicals, including metals, organic compounds, fuels, and solvents from the soil, and transform these chemical into less harmful substances, used as nutrients and/or stored in roots, stems, and leaves?
- a) Eutrophication
 - b) Phytoremediation
 - c) Transpiration
 - d) Evaporation
- 26) Which of the following is NOT a soil property critical to the success of a street tree and its ability to absorb stormwater?
- a) soil porosity
 - b) soil permeability
 - c) soil color
 - d) infiltration rate
- 27) Which of the following is another form of vegetated system engineered to mimic nature?
- a) forested bioswales
 - b) permeable pavers
 - c) piped stormwater
 - d) All of the above
- 28) What are added benefits of urban trees beyond water quality?
- a) Improved air quality
 - b) Reduction of carbon dioxide
 - c) Shading reducing energy costs
 - d) All of the above