



Project OspreyTrack

A project of the Squam Lakes Natural Science Center funded by:
3M Eco Grant, Eversource, and Jane B. Cook 1983 Charitable Trust

S2 – Deadly Links

Teacher Worksheet

Objective:

To have students understand the process of biomagnification in a food chain and describe the possible consequences of pesticides entering the food chain of Ospreys.

Materials:

- Colored chips (representing food) – 2/3 one color, 1/3 a second color approx. 30/student
- Sandwich bags – 1/student
- Surveyor tape bands to designate trout
- Gym pennies to designate Osprey(s)
- Cones to designate area and sidelines
- Biomagnification pyramid drawing
- Marker board
- Dry erase marker

Procedure:

- Introduction – discuss the terms food chain and pesticides, why are pesticides used.
- Divide the class group into three teams on a ratio of 1 Osprey to 3 trout to 9 mayflies.
- Distribute sandwich bags to students to represent the “stomach” of an animal.
- Designate who is a mayfly, trout & Osprey.
- With students eyes closed facing in opposite direction scatter colored chips in the designated area.
- Mayflies go first collecting as many food chips as they can in 30 seconds then stop when time expires.
- Trout are then introduced and allowed to hunt mayflies lasting 30 seconds, tagged mayflies give their stomachs to the trout and then go to the sideline.
- Osprey(s) then are allowed to hunt trout for 30 seconds, tagged trout give their stomachs to the Ospreys (any living trout may continue to hunt living mayflies).
- Ask the animals that are still alive to empty their stomachs and count the number of each colored food chips they have.



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List any surviving mayflies and their food colors, list surviving trout and their food colors, list Ospreys and their food colors.

Inform the students that a pesticide (represented by the smaller number of color chips) was sprayed into the water to kill mosquitoes that were annoying locals and tourists alike and possibly effecting the income of resort owners and the local tourist industry. The pesticide used accumulates in food chains and can stay in the environment for a long time.

Mayflies live in the same areas as mosquitoes and came in contact with the pesticide. Any mayflies that survived but have pesticide contaminated food chips (the smaller # of colored chips) in their stomachs are now considered dead.

Any surviving trout that have half or more of their food chips that are pesticide contaminated are dead.

The Osprey with the highest number of pesticide contaminated food chips is not dead but has accumulated so much of the pesticide that the shells of the eggs that it and its mate produced are so thin that the eggs will not hatch.

Have the students make observations. Introduce concept of biomagnification and show biomagnifications pyramid. Ask students how this would effect Osprey populations and populations of other aquatic animals.

One of the follow up activities has students research DDT and other persistent pesticides and alternative forms of pest controls.



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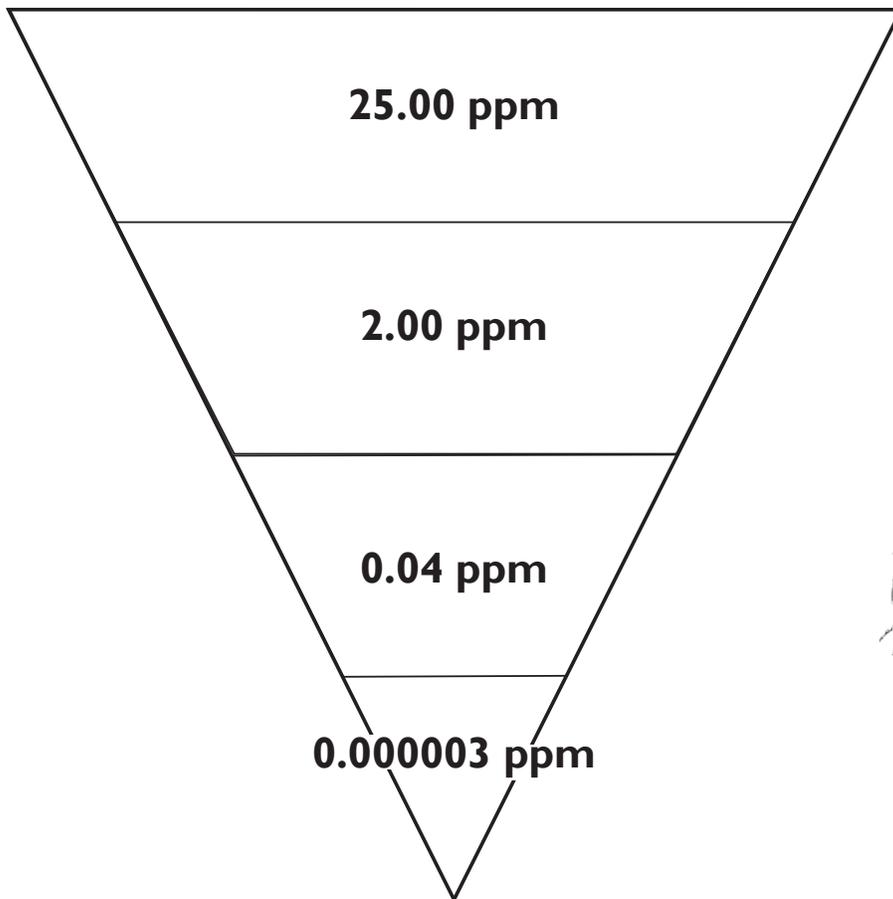
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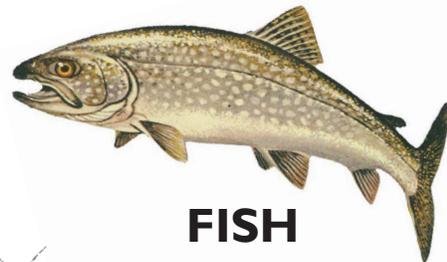
Teacher Worksheet

Biomagnification

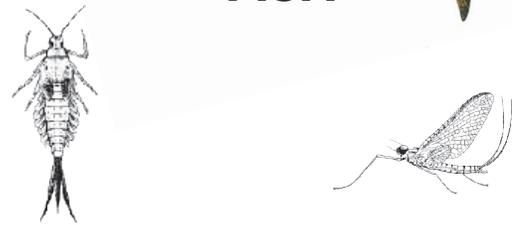
DDT in parts per million per kg



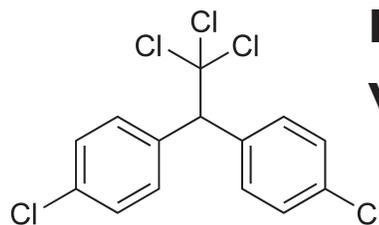
OSPREY



FISH



INVERTEBRATES



DDT IN WATER

