

NOTES FOR RIVER OFE

Name: _____

(DO NOT LOSE!)

- Watershed - The region draining into a river



Rivers of the United States

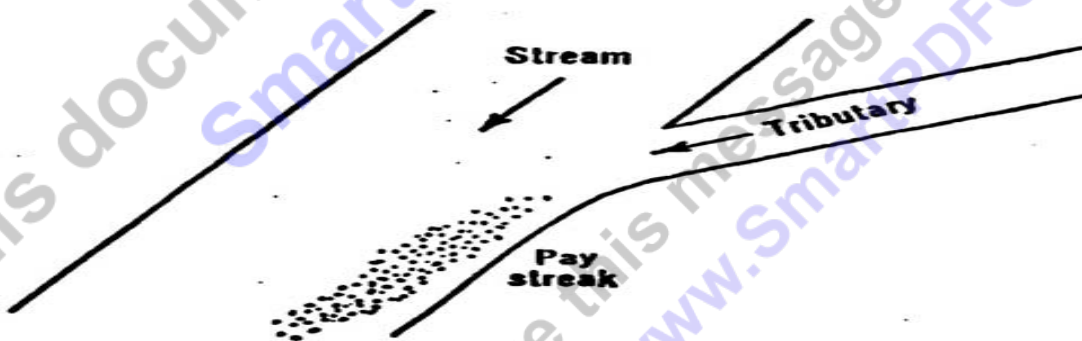


Sections of a river

- Headwaters - Extreme upper reaches of a stream.
- Downriver - Between headwaters and floodplain
- Floodplain - The relatively flat land adjacent to a river channel that is underwater when the river floods
- Mouth/Delta - An area formed from the deposition of sediments at the mouth of a river

Parts of a river / Vocabulary

- **Tributary** is a stream or river which flows into a mainstream.



- **Stream Order** - A classification system for rivers.



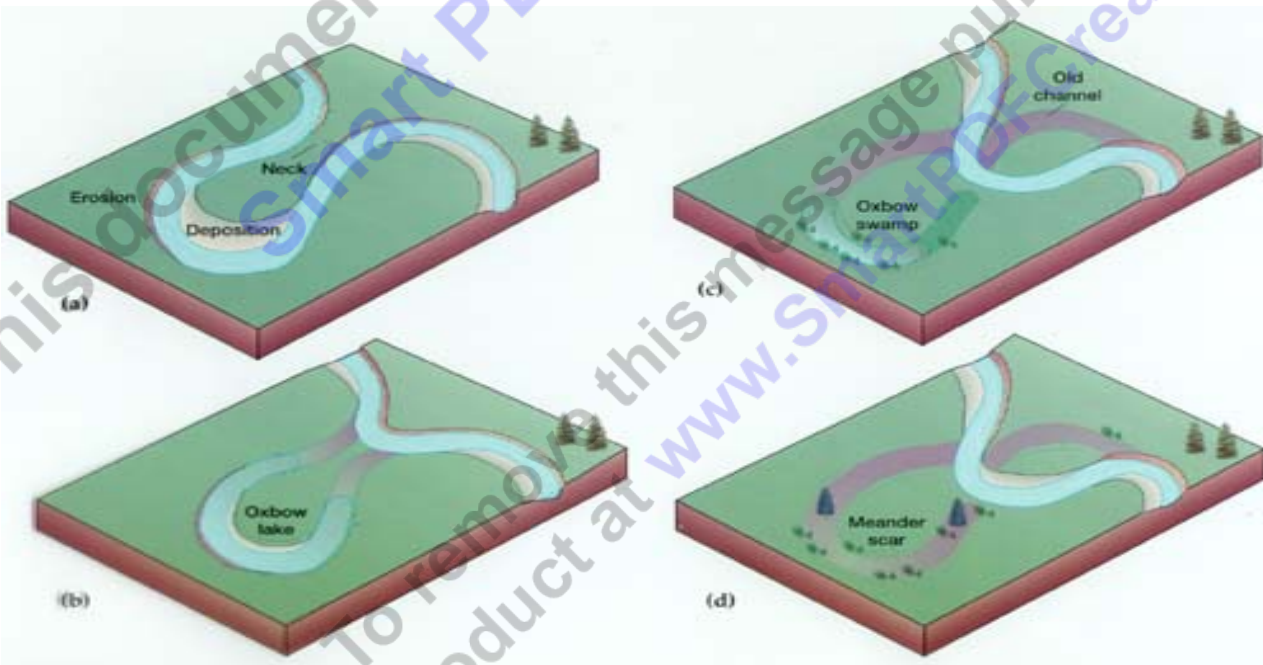
- **Erosion**: Process where fragments of soil and rock are broken off from the ground surface and carried away.
- **Deposition**: Process by which fragments of rock are deposited in a new location

- Meander: Looping curve in a river formed by slowly moving water.



Oxbow Lake: Crescent shaped cut lake cut off from the river that remains when the river cuts a new channel. (An old meander)

Oxbow Formation



- Cut Bank: High steep banks along the edge of a channel.

Riparian Area: An area of vegetation that grows along waterways. Acts as a buffer for pollution and helps prevent erosion.

- Cut Bank: High steep banks along the edge of a channel.
- Pool: Deep section of the river
- Terraces: Areas where the stream overflowed a channel and created a flat floodplain.
- Estuary: the area where a river meets the sea or ocean, where fresh water from the river meets salt water from the sea (tidal)

- Braided Stream: A place where the stream breaks into many smaller streams
- Alluvial Fan / Delta: An area of sediment deposits that build up near a rivers mouth.

Water Quality

This project will study the rivers

- Physical Properties
- Chemical Properties
- Biological Properties

● Chemical Properties:

- Oxygen
- Carbon Dioxide
- pH
- Alkalinity
- Hardness

Aslo - Hardness (calcium + magnesium), Metals (iron etc), nutrients (nitrogen and phosphorus), chloride, sodium, organic compounds, etc.

Biological Properties:

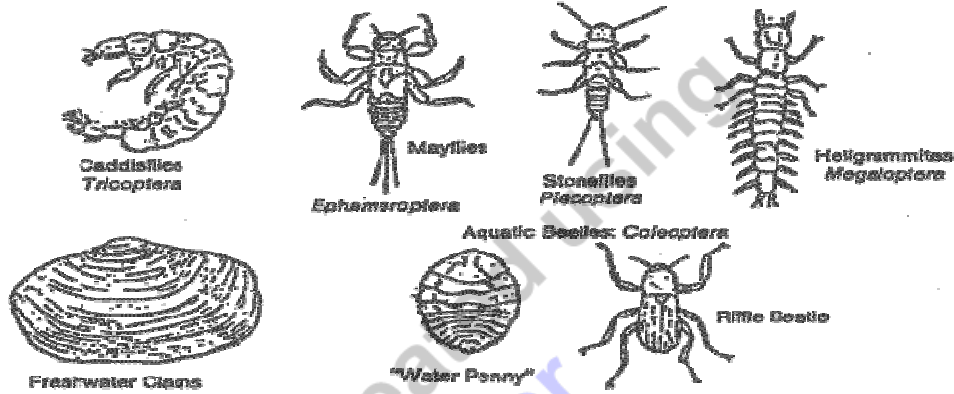
The following live only in unpolluted waters with high levels of dissolved oxygen

- EPT Richness
- E- Ephemoptera (Mayfly)
- P- Plecoptera (Stonefly)
- T- Tricoptera (Caddisfly)

Macroinvertebrates According to Beck's Biotic Index Classes

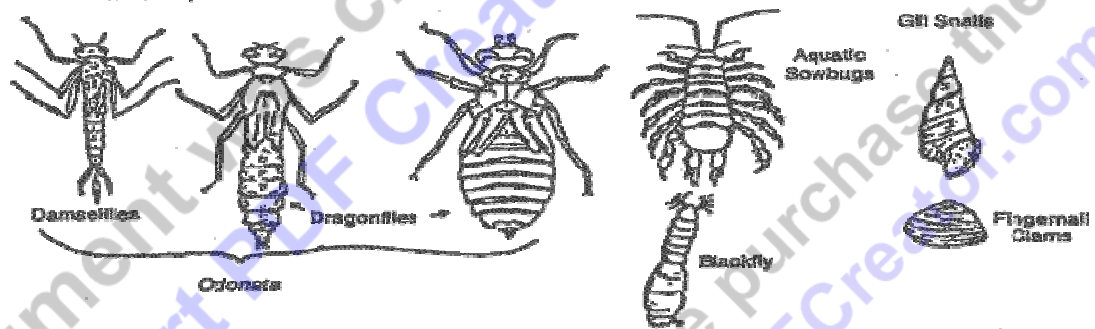
1. Intolerant (sensitive) to pollution:

CLASS
1



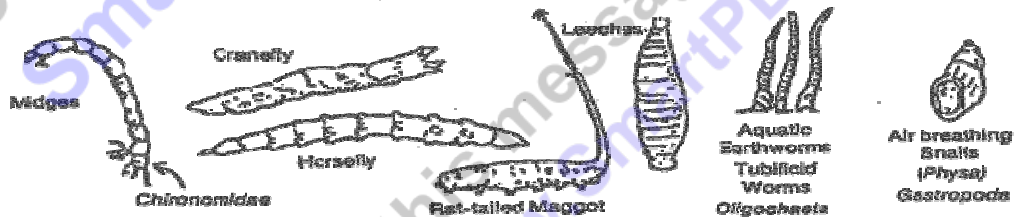
2. Facultative - Can tolerate some pollution:

CLASS
2



3. Tolerant to pollution:

CLASS
3



Physical Properties

- What the river looked like?
- Features of the river?
- What the river smelled like?
- Was pollution visible?
- What was the temperature?
- Was the water clear?
- Vernal Pool: Seasonal wetland area that is dry and largely uninhabited for much of the year, until rains arrive and fill it with water; it teems with life again. Has shrimp, insects, salamanders, frogs, and mosquitoes.

New Area of Focus: Rivers and Flooding.

FLOODS

- Floods are when more precipitation is delivered to a drainage basin than can be readily absorbed or stored within the basin.
- Factors that control flooding
 - **Rainfall intensity** (the rate of rainfall)
 - **Duration** (how long the rain lasts)

Flash Flood: A flood that occurs within a few hours (usually less than six) of heavy or excessive rainfall, dam or levee failure.

- It is very bad to attempt a low water crossing of more than a few inches. Your car will float for a bit, You can't steer, accelerate or break. The pressure of the water will force your car off the road. You will end up down the creek.
- Ice Jam: Floating ice can accumulate at a natural or man-made obstruction and stop the flow of water.
- Coastal Flood: Winds generated from tropical storms and hurricanes can drive ocean water inland and cause significant flooding.

Tsunamis sometimes referred to as tidal waves. These waves are produced by earthquakes or volcanic activity. They can cause flooding.

- Warning signs of an approaching Tsunami.
 - Earthquake in area
 - Bay recedes
 - Warning systems
- Urban Flood: Streets flood because cement cannot absorb water. Water run-off creates floods.
- Wetlands - An area that is regularly wet and has vegetation that is adapted for life in saturated-soil conditions.
- Wetlands are extremely important because they...
 - They help control flooding by absorbing water like a sponge.
 - They also filter out / break down pollution. (Biogeochemical cycling)
 - Wetlands are habitats for many animals and plants

New Area of Focus: Flood Prevention

Flooding and Levees

- Natural Levee: A long ridge formed by deposits of sediment alongside a river channel.
- Artificial levee: An embankment raised to prevent a river from overflowing.

Types of Levees

- Mainline - Levees that lie along the mainstream and tributaries
- Ring Levees - Levees that completely encircle or "ring".
- Setback Levees - Levees that back up existing levees. They are further away from the existing levee.
- Spur levees - A barrier that projects into the stream to prevent water current from slamming a levee. Not a true levee.
- Stabilizing rocks on river bank to prevent erosion / river changing course

Dams and Ecosystem

Dam: A barrier constructed across a waterway to control the flow or raise the level of water.

Importance of dams

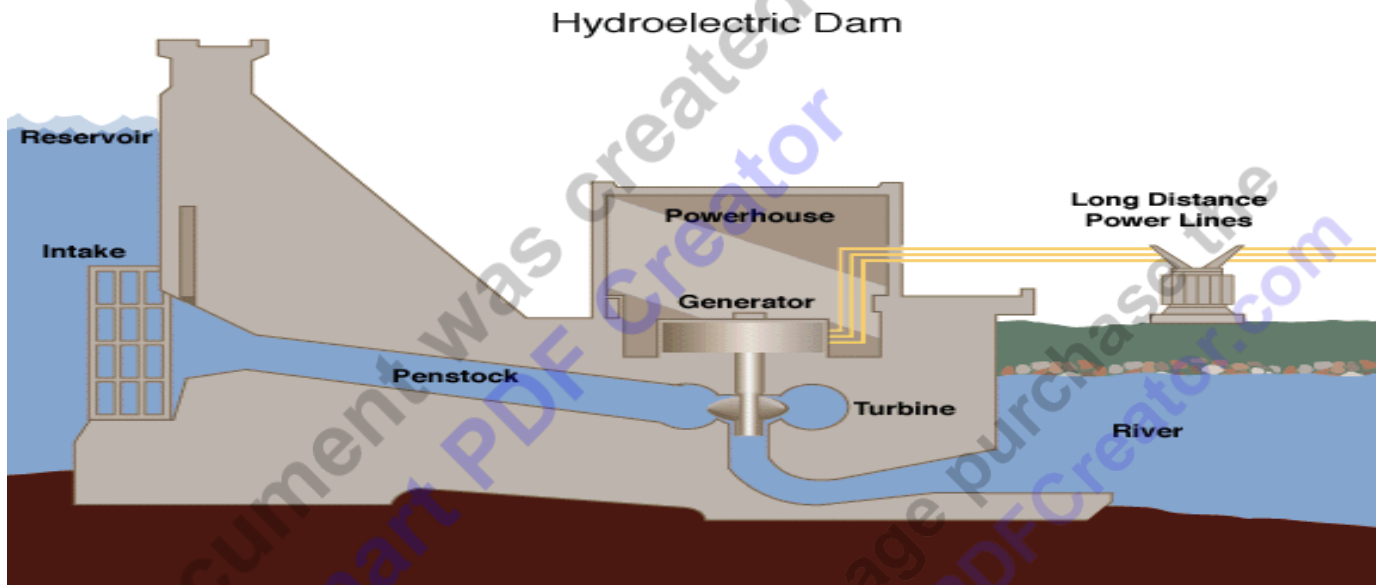
- Control Floods
- Generate Power
- Provide clean drinking water
- Improve navigation
- Recreation
- Industrial uses
- Agricultural use

Hydroelectric power is a renewable and clean source of energy.

<p>+ Positives of dams</p> <ul style="list-style-type: none"> ● Control Floods ● Generate Power ● Provides clean drinking water ● Improve navigation ● Recreation ● Industrial uses ● Agricultural use 	<p>Negatives</p> <ul style="list-style-type: none"> • Floods Habitat • Displaces people and animals • Changes river flow • Costs a lot of money
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- A **lock** is a device for raising and lowering boats between stretches of water of different levels.

Parts of a Dam: Water travels down the tunnel from above, spins a turbine which generates electricity. The electricity follows the power lines to your home.



Salmon and Fish

Salmon are Anadromous fish: Fish born in , then migrate to the to grow into adults, and then return to to



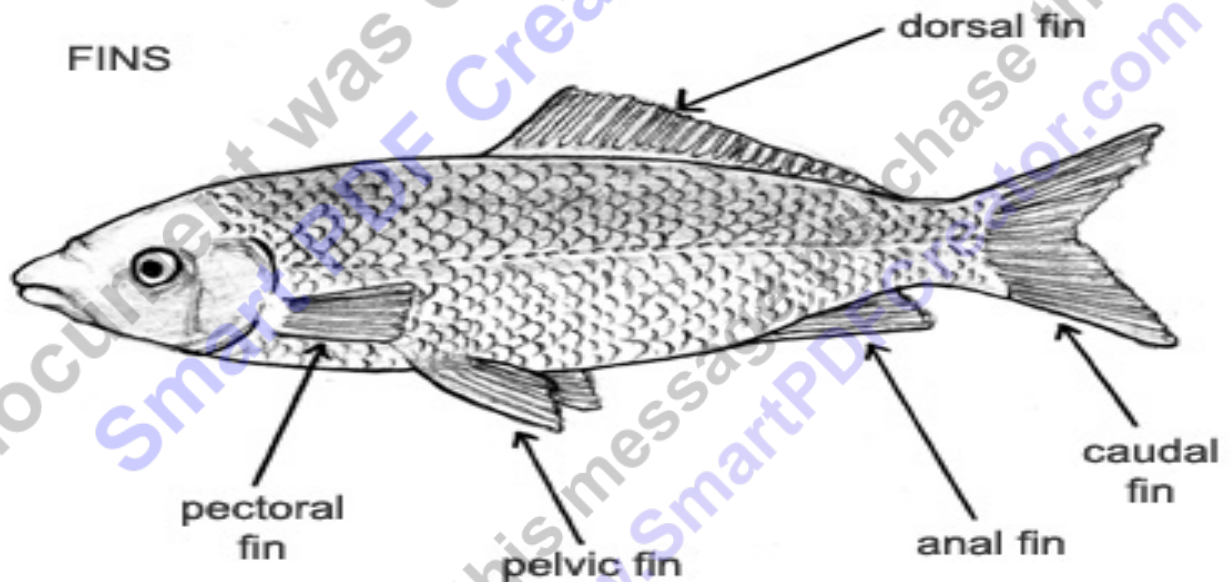
Systems to help Salmon

- Fish bypass (going downstream)

- Fish Ladder (going upstream)
- Stocking and transportation
- Protection of spawning grounds

Fish Are...

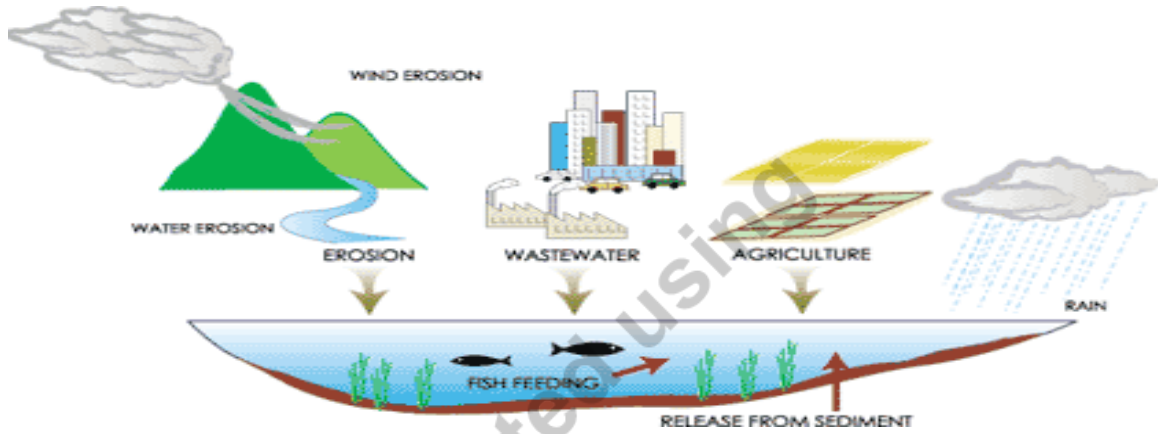
- Cold-blooded
- Have fins
- Have backbones
- Have scales
- Gills



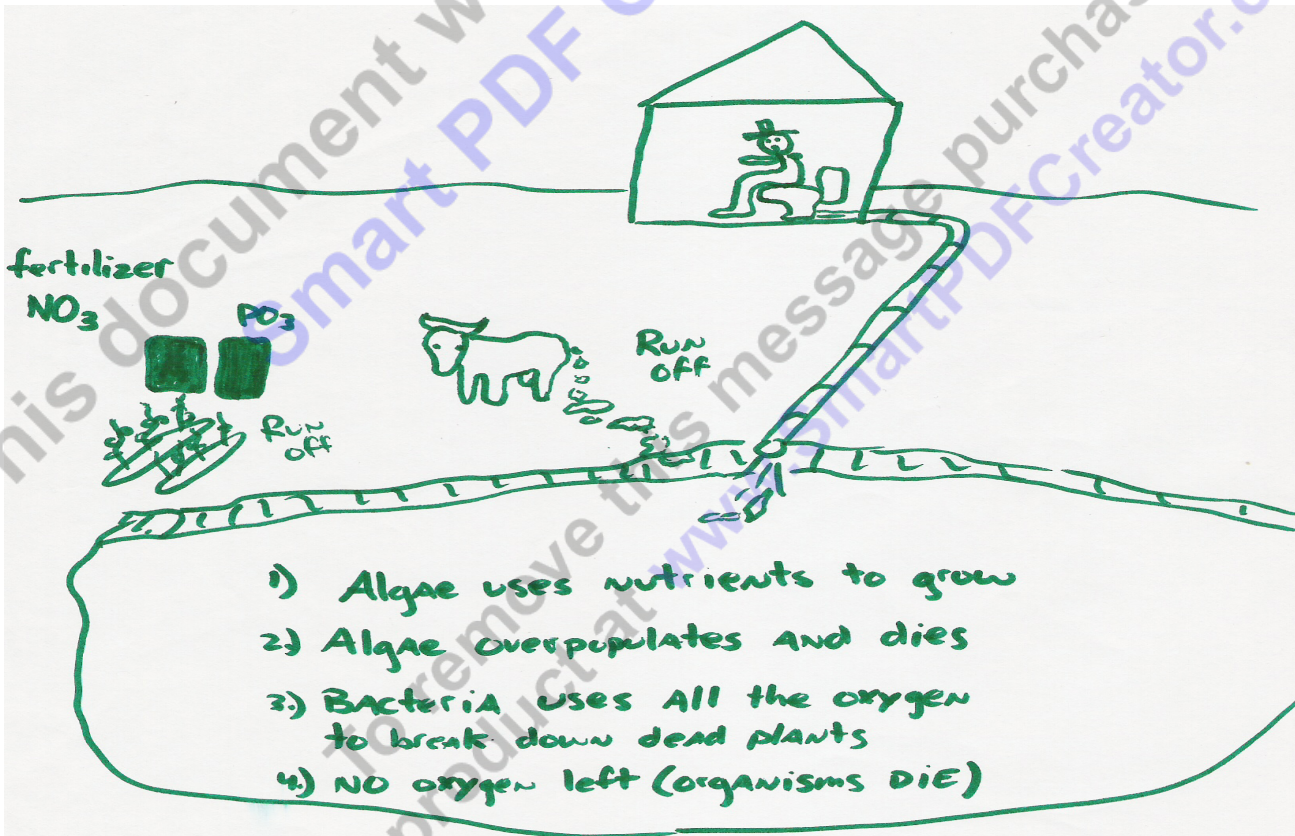
Layering in a Lake

- Epilimnion: The upper layer in a layered lake.
- Thermocline - A layer within a body of water where the temperature changes rapidly with depth.
- Hypolimnion - The bottom and most dense layer of water in a lake. Non-circulatory and remains cold throughout the year

Nutrients and Lakes



- Eutrophic Lakes: Having concentrations of nutrients optimal or for plant or animal growth.
- Nutrients can be phosphorus and nitrogen.



- Mesotrophic Lake: Production is considered moderate.
- Oligotrophic Lake: Describes a lake or river with low productivity.

RIVER OFE DUE SOON

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