

Lab - Reading a Salmon Scale.doc

PART A - Read the background information

PART B - Label sections with given diagram

[MUST BE PASSED IN TOMORROW]

PART C - Age determination on two given scales

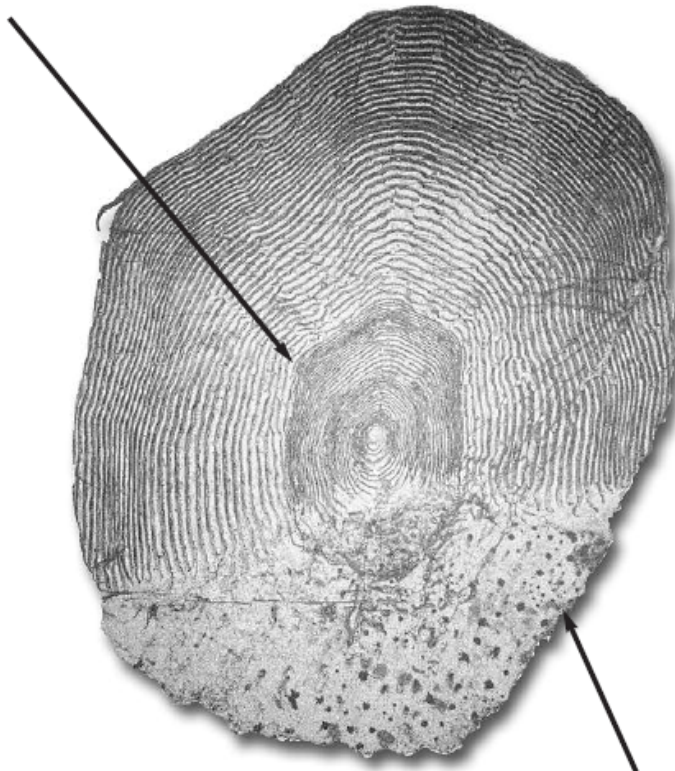
[TOMORROW]

READING A SALMON SCALE

Have You Read Any Good Salmon Lately?

The scales of a fish are like a book; they tell a story. Information about how old a fish is, where it has lived, and if it has been eating well can be gathered from its scale.

left for ocean as 2 year old smolt



Returned from ocean as a grilse (1 year at sea).

In figure __, the rings that form around the centre or core of each scale represents stages in either fresh or saltwater. The most widespread method of aging salmon parr and adults involves collecting scales. When clean and undamaged, scales show progressive growth rings similar to the rings on a tree. As the salmon grows, new growth rings are laid down in the scale as it gets bigger. The scales with their growth rings can be magnified in order to accurately reveal the life history of an individual salmon.

During the growth of salmon, ridges (or rings) are formed around the centre of the scale (also known as the focus or nucleus). It has been determined that these rings are found in proportion to the growth of the fish.

It is from these groupings that we can analyze the growth rates and ages of salmon. The wide-spaced rings are summer growth, while narrowly-spaced rings are winter growth. While growth is usually determined by temperature and amount of food intake, these terms indicate increased food and growth in summer periods and a decrease in growth during winter when temperatures are colder and food is less abundant.

Does Scale Sampling Harm the Salmon?

An advantage of scale sampling is that scales can be removed without harming the fish. Scale samples are regularly collected from the brood stock of an enhancement project and from fish collected during stream surveys and recreational fishery surveys.



Salmon scales

The examination of an adult salmon scale reveals 2 distinct parts which can be defined as:

- 1. River life:** the period spent in freshwater up to last river annulus. Salmon parr populations in different areas experience a very wide range of environmental conditions and thus exhibit large differences in patterns and rates of growth. The mean age at which salmon smoltify, therefore, varies from between 1 and 2 years in some southern populations in Europe and North America to 7 years in Labrador and northern Norway.
- 2. Sea life:** the period from the onset of sea growth; it may include time spent in freshwater as an adult.



An Atlantic salmon's scales tell the story of its life - and even its ancestry and place of birth.

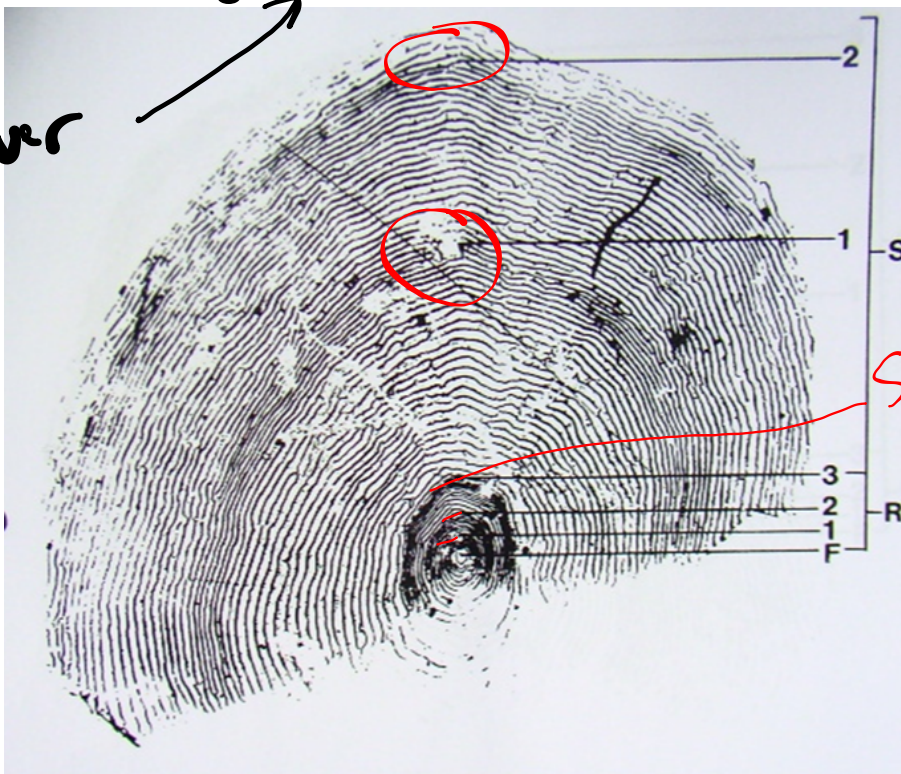
Growth rings on the scales tell the story of the salmon's growth, when it moved to salt water, and its return to fresh water after time at sea. The scales can tell us how many times the salmon has spawned, and can indicate the age.

Even growth rings can be an indication of Atlantic salmon raised in captivity, and whether the fish is an escaped farm-raised aquaculture salmon.

DNA, that can be extracted from the scales, can determine the relationship of that particular salmon to other groups of salmon, and ultimately can tell us from which stream, and even which section of stream the salmon came.

EXAMPLE: Age 3.2 +

River

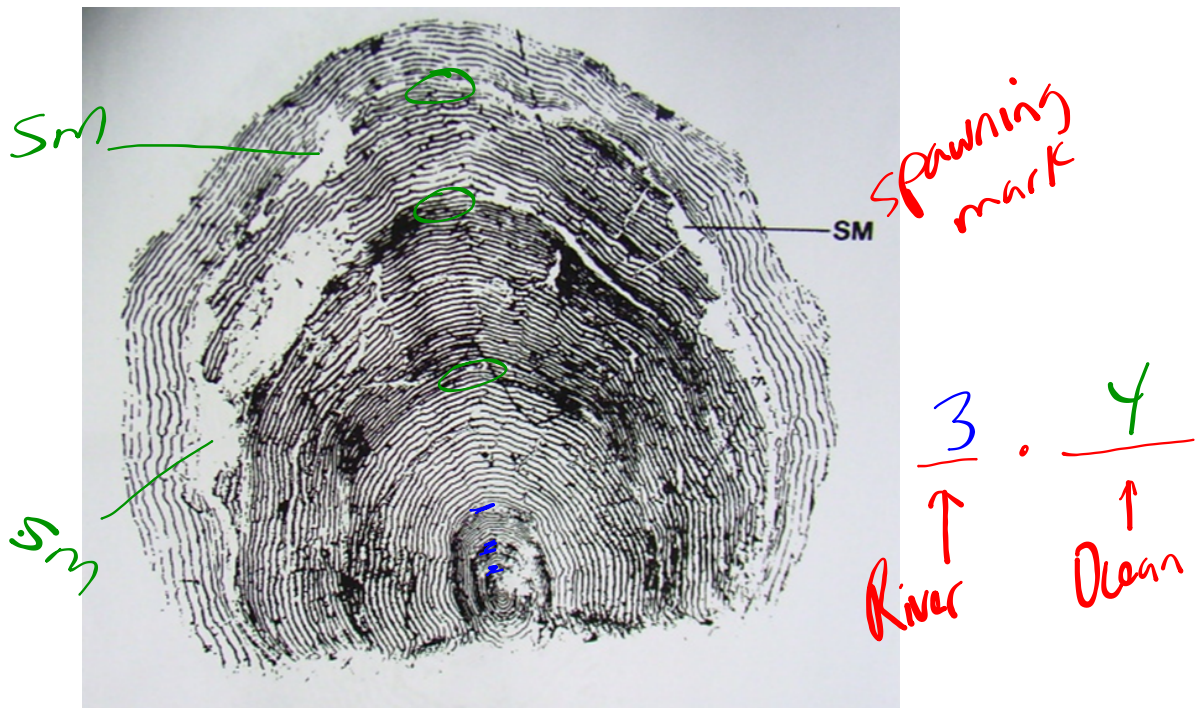


Small mark

EXAMPLE: Age 3.3+ *sampled*

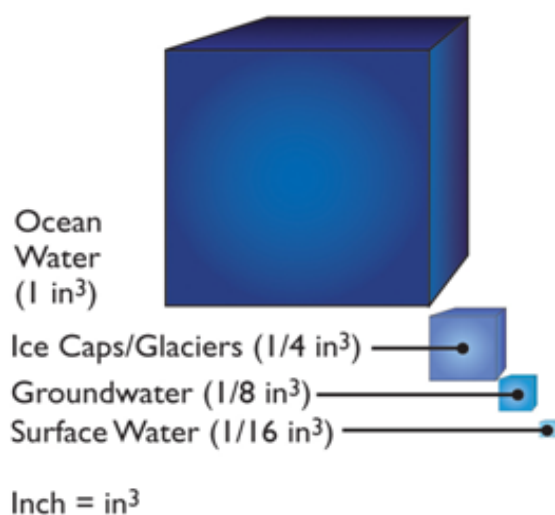


EXAMPLE: Age 3.3+ with a Spawning Mark



The Earth's Water Supply

If the volume of water in the oceans is represented by a one-inch (2.5 cm) cube, a one-fourth inch (0.6 cm) cube would represent the water stored in the ice caps and glaciers. A one-eighth inch (0.3 cm) cube would represent groundwater, and a one-sixteenth inch (0.15 cm) cube would represent surface water.



What is Stewardship?

Stewardship is one of those words that we hear all the time without really knowing what it means. In fact stewardship is a hard thing to define, but it is about how we are in the world: the way we care for it, respect it, live in it. It is about being actively involved in making the world be a place we want to live in. Our goals as stewards are to develop the skills necessary to make the changes we desire, and to organize ourselves and others to take action in a responsible, caring and knowledgeable way.

Why Watershed Stewardship?

Ninety percent of the world's water is contained in salt oceans. Of the remainder, 69 percent is in the form of ice and snow. Freshwater for human use, found in lakes, swamps, rivers and underground, makes up only 0.008 percent of the world's water. In British Columbia we are lucky: we have streams, lakes, rivers and estuaries covering 1.25 percent of our province. But as the population grows, more and more of this available water is being contaminated by human development.

Many kinds of skills are useful to a watershed steward, but all stewards share some characteristics. A steward is worthy of trust, demonstrates respect for life, carries a genuine heart, embodies constancy of mind, and acts with autonomy.

Stewardship...

- actively involved in caring for the environment

WATERSHED KEY TERMS...

Miramichi River Watershed: This is the area of land where all the water on the surface flows into the Miramichi River and makes it's way towards the ocean.

Tributary: Is a stream or a brook or a spring that flows into a river (Miramichi River) and adds more water to it.

example: Renous River, Cains River, Dungarvon River, etc...

Erosion: Is when the current from the river or stream washes away the stream bank or river bank because there is **NO** vegetation (no plants, no trees, no bushes). Erosion is bad because it turns rivers and streams brown and muddy which suffocates and kills young fish and other aquatic organisms.

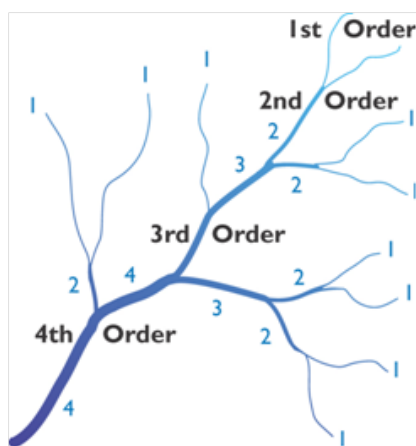
Sediment: Fine particles that are found on the bottom of a river stream (smaller than sand).

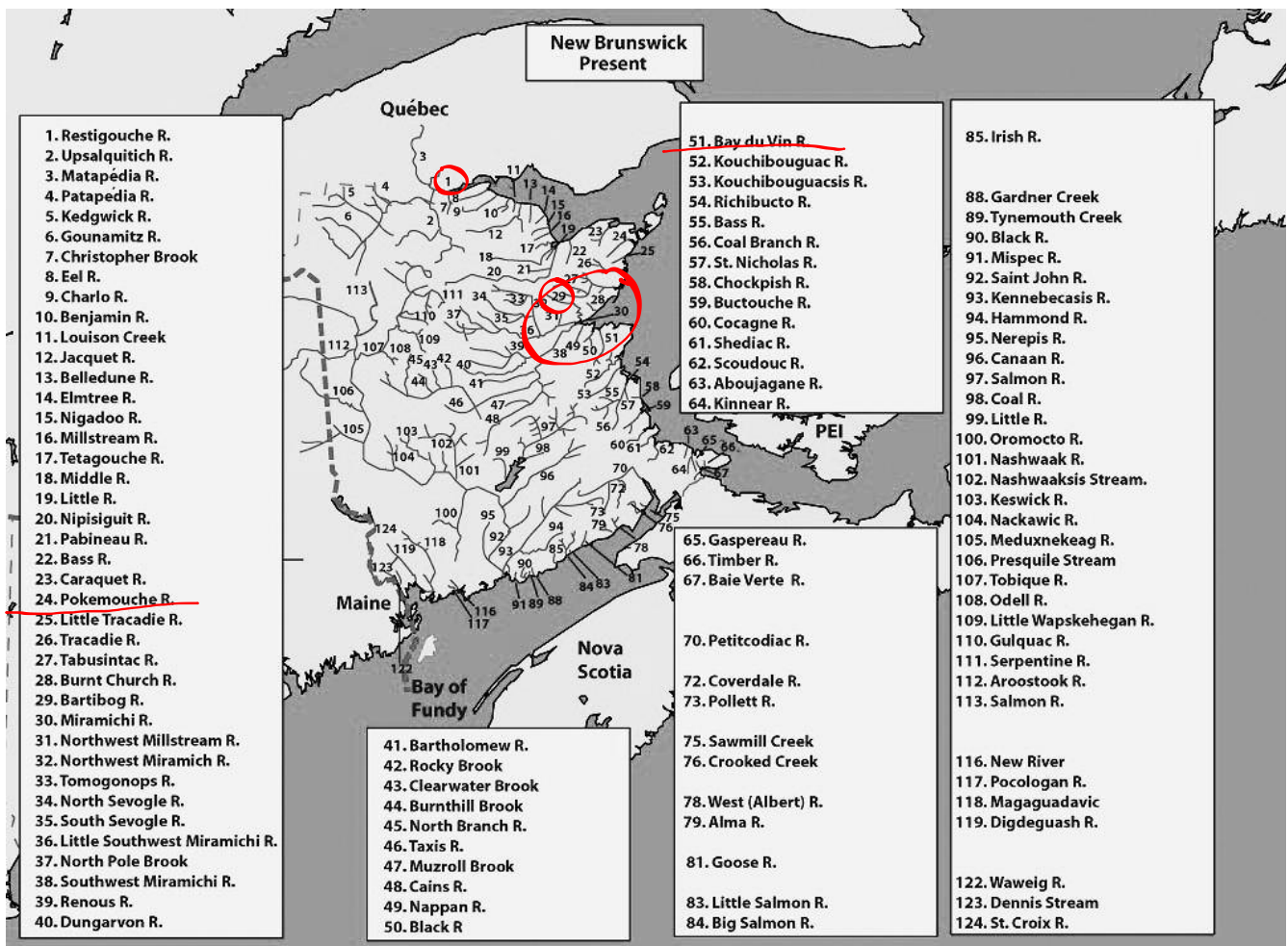
Substrate: The type of bottom a river or stream has (rocky, sand, mud, sediment or silt).

Dissolved oxygen: all water contains dissolved oxygen. We can measure how much oxygen water contains. Cold water holds more oxygen and is better for fish and other organisms.

Stream Classification

Streams are classified by their size. The smallest streams are first-order streams. When two first-order streams meet they form a second-order stream. The place where the two streams meet is the confluence. The stream formed at the confluence of two second-order streams is a third-order stream. The process continues until the stream or river empties into a lake or the ocean. The place where the river system ends is its mouth.







<http://www.mreac.org/>

NOTES - Miramichi Watershed.pdf

MISSION

The Miramichi River Environmental Assessment Committee is a community based multi-stakeholder organization dedicated to the continual improvement of environmental quality of the Miramichi River ecosystem with emphasis on the Miramichi watershed.

MREAC will accomplish this mission by:

- Constructive consultation, cooperation and partnering with government, industry, municipalities and other stakeholders wherever possible.
- Supporting the advancement and application of scientific knowledge.
- Promoting and supporting an appropriate level of enforcement of environmental regulation.
- Active involvement in independent environmental monitoring.
- Promoting the responsible use of technology in environmental improvement.
- Celebrating and promoting the Miramichi River's environmental qualities and values as appropriate to sustain a healthy sense of pride and stewardship.
- Venturing beyond our ecosystem boundary when needed to understand external factors impacting our watershed, to gain useful knowledge and promote sharing of information and technological exchange.

Attachments

Lab - Reading a Salmon Scale.doc

NOTES - Miramichi Watershed.pdf