

# LAB: Dissection of a SMOLT...

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Env. Sci. Lab - Dissection of a smolt.pdf

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## Biology 1017 - LABORATORY 8

### LEARNING ABOUT VERTEBRATES

#### Preparation

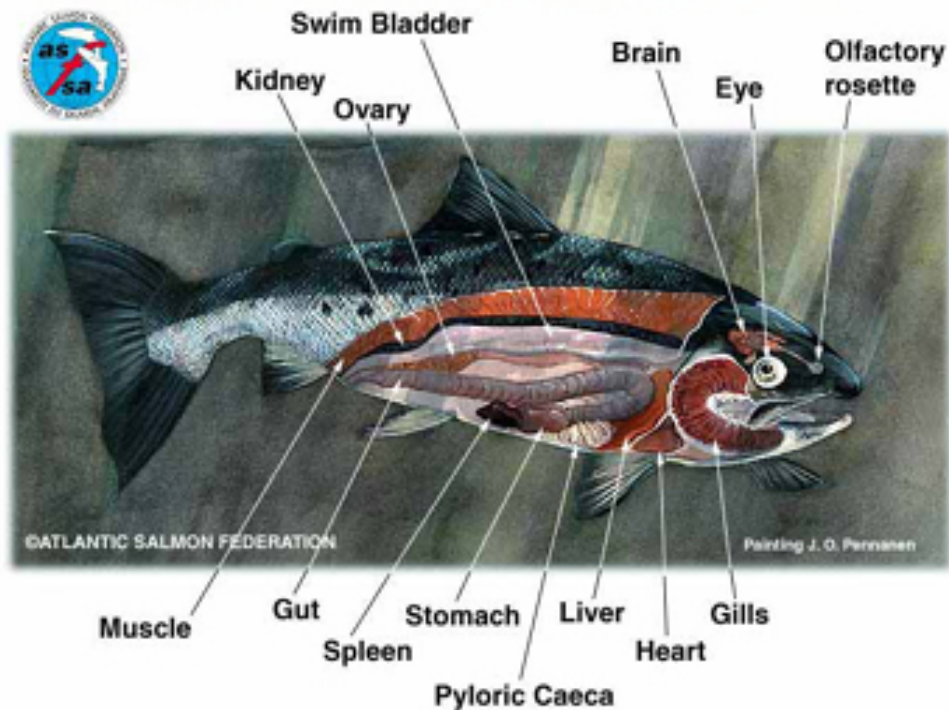
Read this exercise before you come to the laboratory. Understand the following terms: chordate, vertebrate, evolution, respiratory system, circulatory system, urogenital system, photoreceptor.

#### Objectives

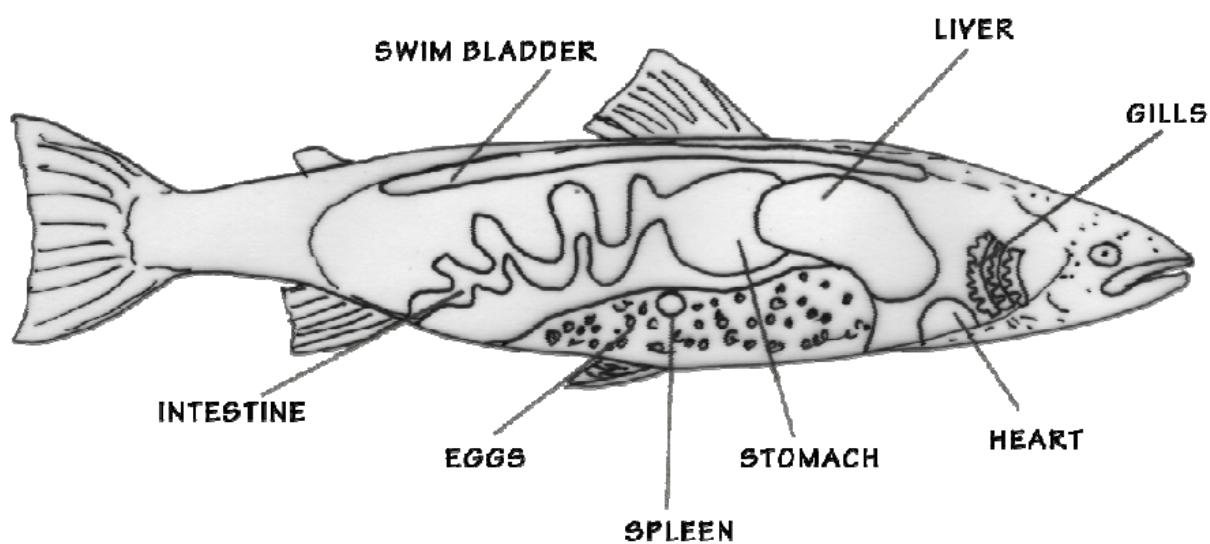
1. To study the external and internal anatomy of a representative vertebrate (specifically, a fish)
2. To study the structure of a vertebrate eye
3. To understand evolutionary trends in animals

# Internal Anatomy of an Atlantic Salmon

*Wild Atlantic salmon - designed for survival*



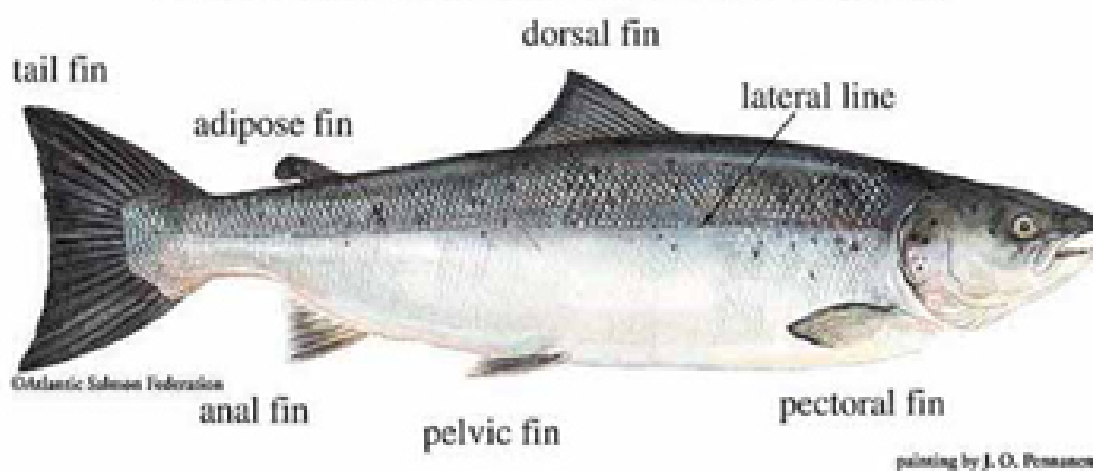
### Internal Anatomy



## External Anatomy of an Atlantic Salmon

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### Fins & Lateral Line of wild Atlantic Salmon

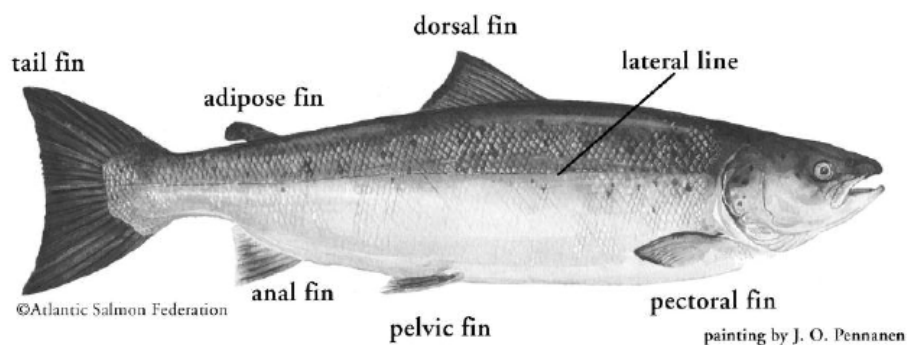




## NEED HELP WITH FIN NAMES?

### Getting to Know Trout and Salmon – Name Those Fins...

The fins of the trout and salmon species all have the same names, so learn them once, and you know them all. Taken together, the eight fins give these fish both maneuverability and power. This helps them evade predators, and allows them to pursue prey efficiently. In several instances the markings on the fins can help identify the species of salmonid.



## READING A RIVER

READING A RIVER,

**NOTES - Reading A River.pdf**

READING A SCALE,

**Magic on the River - MODULE 3**

KNOW THE FLY ROD THAT MATCHES YOU

### Introducing the 21st Century Angler!

What makes a 21st century angler? First, there needs to be an awareness of the resource, that is, how plentiful, how fragile, and how vulnerable it is to others who may not be so aware. For instance, for the Atlantic salmon, it is a struggle for survival today more than ever.

Wouldn't it be wonderful to stand at the edge of a river and "know", with a quick glance, that it is indeed, the right (or wrong) place to angle? It is possible to learn this skill that is so often thought as being reserved for "old wise men of the river". The key is patience, perseverance, and common sense.

### Why is "Reading the Water" an Integral Part of the Experience?

It is a truly rewarding experience to approach a stream, survey it, and then to cast your line to immediately catch a fish.

For an experienced angler, this isn't just a chance occurrence. It comes from effectively surveying an area to determine if fish inhabit this space. Like solving a puzzle, reading the water requires common sense and an analytical approach.

### Some key characteristics of streams:

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- *Water runs downhill.* Everything else follows from this basic fact.
- Depending on the *shape* of the streambed and its drop in elevation, this will determine the stream's changes in depth and speed.
- The *character* of the streambed will create areas that vary the speed and direction of the flow.
- Streambeds can consist of *bedrock, mud, clay, gravel, boulders and various other debris.*



### *Salmon Sense Currents*

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*Atlantic salmon and trout are able to sense currents through sensing organs within their lateral line. Through most of its life in streams, Atlantic salmon are 'programmed' to face up-current, and hold their position.*

*However, changes in the hormone balance while Atlantic salmon are becoming smolt change that behaviour to swimming down-current, especially during night-time.*

*Atlantic salmon also use their ability to sense current in order to find upwellings below rapids and waterfalls. These upwellings allow them to boost their speed as they power up over the obstacle on their migration back upstream as adults.*



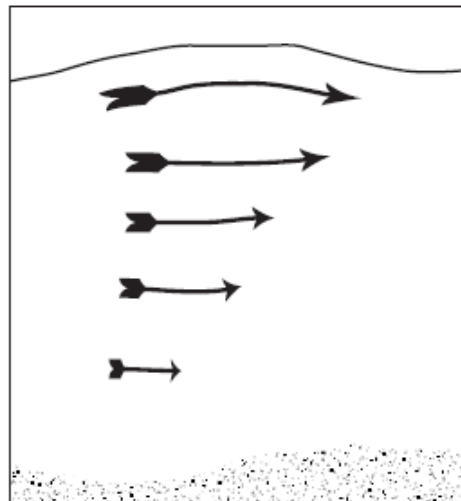


## Get To Know the Flow — Puzzling out Currents

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Learning the basic rules about water flow will help you understand a stream. It will help you understand where food accumulates, where salmon and trout swim, and where they will lie quietly, using the least energy.

- While water tries to flow smoothly, the stream edge and bottom cause resistance. This makes water currents fastest near the surface, and away from the edges of the stream.
- Turns in a streambed, obstructions such as boulders or trees all help to break up the stream's currents into many different currents. As they flow downstream, over time they will eventually merge. New obstacles almost always continue to break up this even flow into more swirling currents.



**First rule:** Currents are likely to flow faster near the surface than near the bottom of a stream.

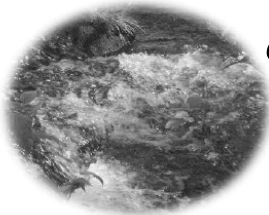
## What is a Current Seam?

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A **current seam** occurs where two different current speeds meet and run alongside each other for a while before merging into one (see page 51). Current seams offer ideal places for fish to rest and have access to a variety of food. Trout will lie in the slower water, taking advantage of the fact that food dislodged or pushed along by the faster water will be swept by them. Salmon in migration upstream do not eat, but will still take advantage of these areas to reduce energy use.

It would take more effort, and hence burn more precious calories, to fight the current and chase after a meal. Unless competition is fierce, a fish—especially a large fish—will seek out the easiest, most economical way to eat. In moving water, feeding fish will usually lie facing upstream where there is shelter from the moving water and the current will bring dinner within easy reach.

Words to Help You Understand Currents



**Eddy:** A submerged boulder or log is the first place most anglers learn to look for fish. The obstruction slows down water and creates an eddy, a slow, swirling area on the downstream side.

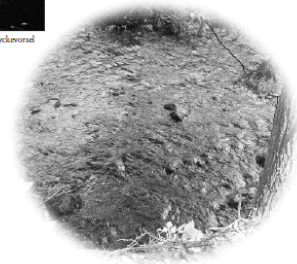
**Undercut:** An area where the bank overhangs the water, is another good place to look for trout. Undercuts are usually formed on the outside of a curve, where fast moving water cuts the channel more deeply than it does on the inside. There is usually a nice, deep lie at the bottom of the channel.



Gilbert van Ryeckovorsel

**Pools** are wide, deep sections of water. Salmon usually rest in the slow water at the bottom of the pool. They tend to feed at the head or tail of the pool, because there is a constriction there to funnel food items together.

**Riffle:** An area where friction breaks up a stretch of water. Riffles are usually caused by beds of small to medium sized boulders.



## Attachments

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