

Adaptations of Trout Around the World

Description:

Students will learn and discuss the external parts of the trout. They will observe different adaptations of the trout species from around the world, specifically the type of camouflage the trout use. This lesson is best suited for elementary school students but can be modified for use with middle and high school students.

Objectives:

- Learn how to identify external parts of a trout
- Analyze trout adaptations
- Discuss trout camouflage
- Understand the relationship between the environment and species adaptations

Vocabulary:

Camouflage, adaptation, environment, external anatomy, aquatic. Basic anatomy: mouth, nostrils, gills, fins, eyes, lateral line. For older students, specific fins: adipose, caudal, dorsal, pectoral, pelvic, ventral

Materials:

- External Trout Outline
- Images of four different trout environments
 - [Rocky](#)
 - [Sandy](#)
 - [Vegetated](#)
 - [Deep water](#)
- DEP illustrations of trout species from around the world
- Colored pencils or crayons

Background Information:

There are many ways living things adapt to their environment. One way organisms evolve to thrive in their local environments is by adapting various types of camouflage, which helps them hide from predators. Adaptation refers to the process of an organism changing in order to better survive in its environment. Typically, this is a slow process that happens between multiple generations and not within one organism's lifetime.

There are several environments that trout live in, which include sandy, rocky (small and large rocks), deep water, and heavily vegetated areas. Depending on the environment in which the trout live, the external features they have can differ. Those in rocky environments have spots, sometimes in varying colors, that resemble the rocks, gravel, and pebbles in their area. Trout that live in more vegetated areas have patterns that look like aquatic, resembling their color and shape. Trout that live in deeper water typically have a more shiny or striped appearance. Some trout demonstrate several adaptations at one time to camouflage in different environments. These adaptations make trout more suitable for their environment, thus increasing their chances of survival.

Method:

- Print DEP illustrations and laminate if possible for students to use as a reference.
- Print one external trout outline for each student.
- Introduce the trout illustrations to the students. Point to different parts of the trout and have students identify them.
 - Mouth
 - Fins
 - Gills

- Eyes
- Nostrils
- Ask students what they notice about the trout. Similarities? Differences?
- Explain the concept of adaptation. Ask students if they have ever had to adapt or change to their environment (i.e. changing an outfit on a hot day).
- Have students discuss why they think the trout are different. Students should focus on the environment the trout live in and relate it to the trout adaptations, or how they have different features depending on their environment.
 - Discuss the different types of environments the trout are in (sandy, deep water, vegetated, and rocky).
 - Ask what types of features students notice depending on the different environments:
 - In sandy environments, trout have small spots
 - In rocky environments, trout have spots to blend into the rocks
 - In deep water, trout are shiny to match the light patterns in the water
 - In vegetated environments, trout have squiggly marks to blend in with plants
- After analyzing the trout's anatomy, environment, and adaptations, hand out the external trout outline to each student.
- Students can sit in groups at tables to share sample illustrations and coloring utensils.
- Give each group 3-5 illustrations, each showing different adaptations. Students can choose one of the illustrations as a reference to draw 1-4 adaptations on their trout.
- As students are coloring their trout, they can also draw the trout's environment (e.g. rocks, plants, sand, or deep water) to illustrate the environment in which their trout lives.
- After students have finished coloring in their trout, discuss the adaptations they drew.

Focus on the connection between the trout and their environment.

Discussion:

- What type of environments do these trout live in?
 - What do you see in their environment? Are there a lot of rocks? What about plants?
 - What differences do you see between the trout?
 - Why do you think they are different?
- How do you think these adaptations help the trout?

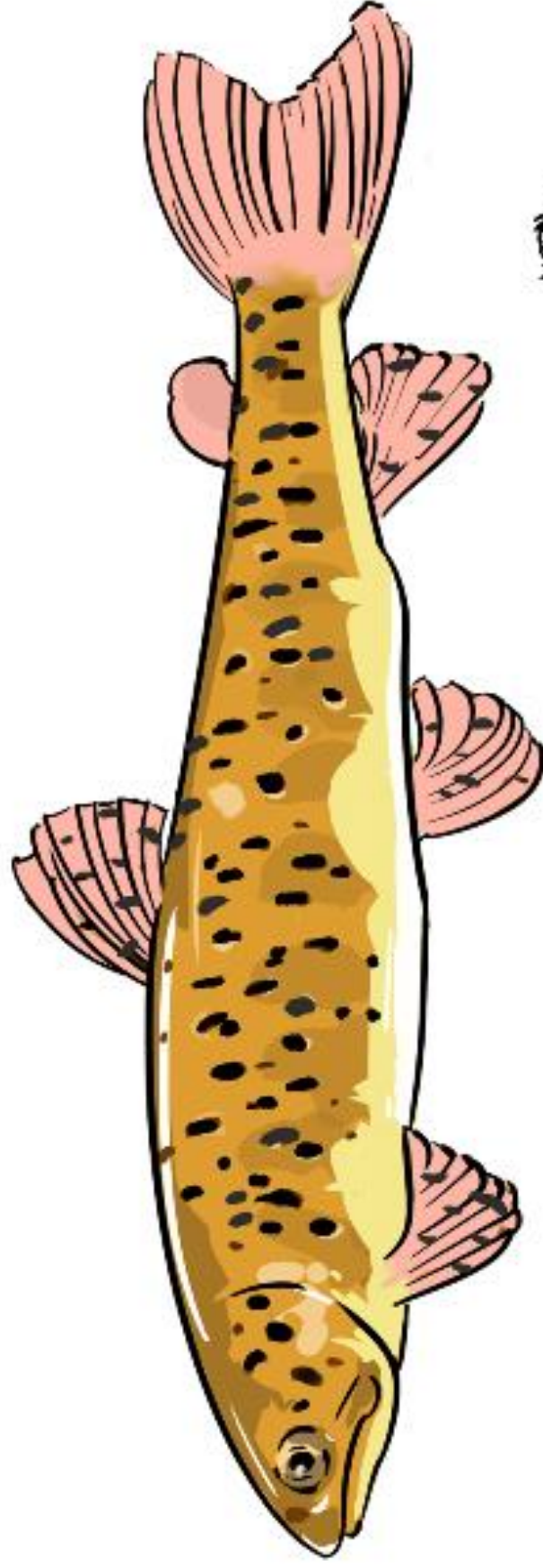
Extension:

- Ask students to draw their own trout. After understanding adaptations related to environment, students can create their own environments and draw what adaptations their trout would have without referencing the illustrations.
- Have the class build their own trout environments in groups. Using recycled materials like plastic cups, bags, and paper clippings, students can create different trout environments, using the trout images from the lessons as reference.
- Teach a lesson on internal trout anatomy for a more holistic view of trout evolution and adaptation.
- Incorporate a geography component where students mark different species of trout on a world map or globe.
- Discuss different cultural contexts of the various countries in which each trout species originates. Does the local culture enjoy fishing? Eat the trout? Are any of the species endangered?

NYC Department of Environmental Protection

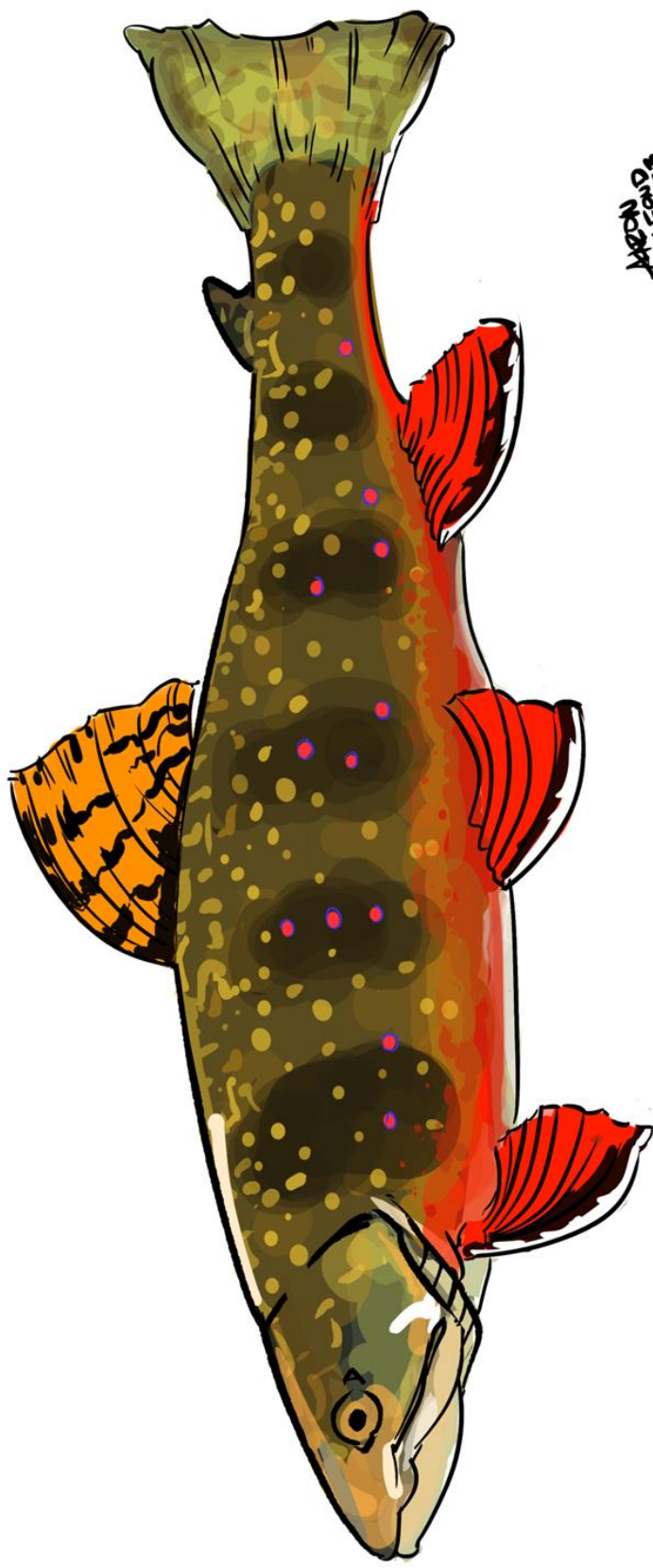
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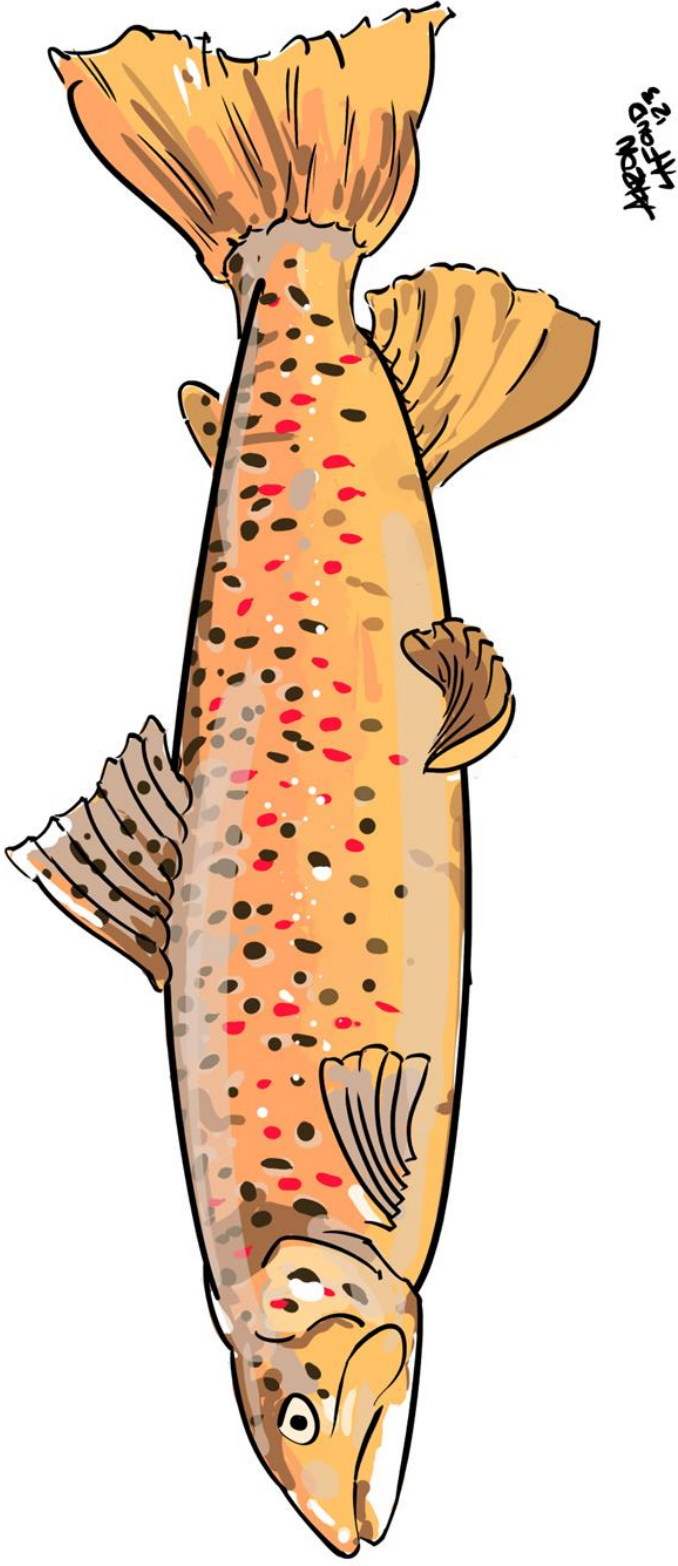


Abant trout, *Salmo abanticus*

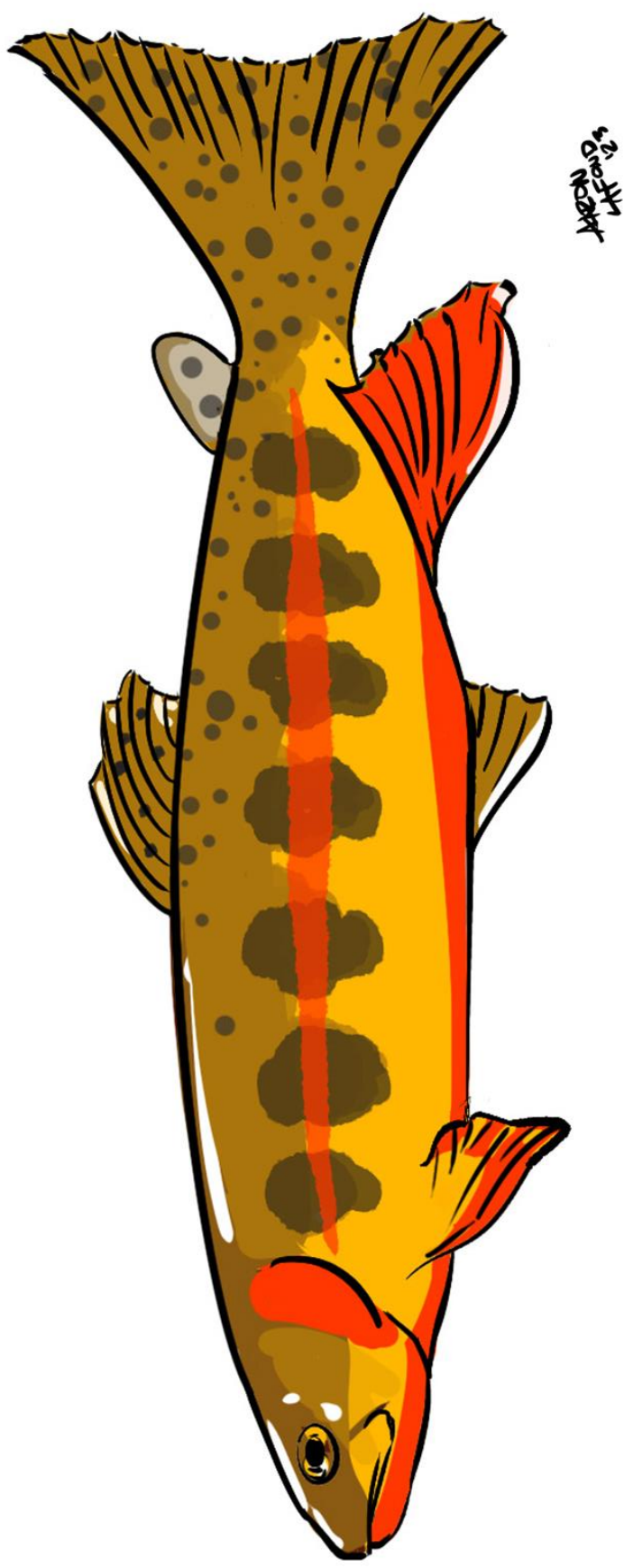
Abant Lake, Northern Turkey



Brook Trout, *Salvelinus fontinalis*
North America



Brown Trout, *Salmo trutta*
Europe, West Asia, and North Africa



California golden trout, *Oncorhynchus aguabonita*
California, USA

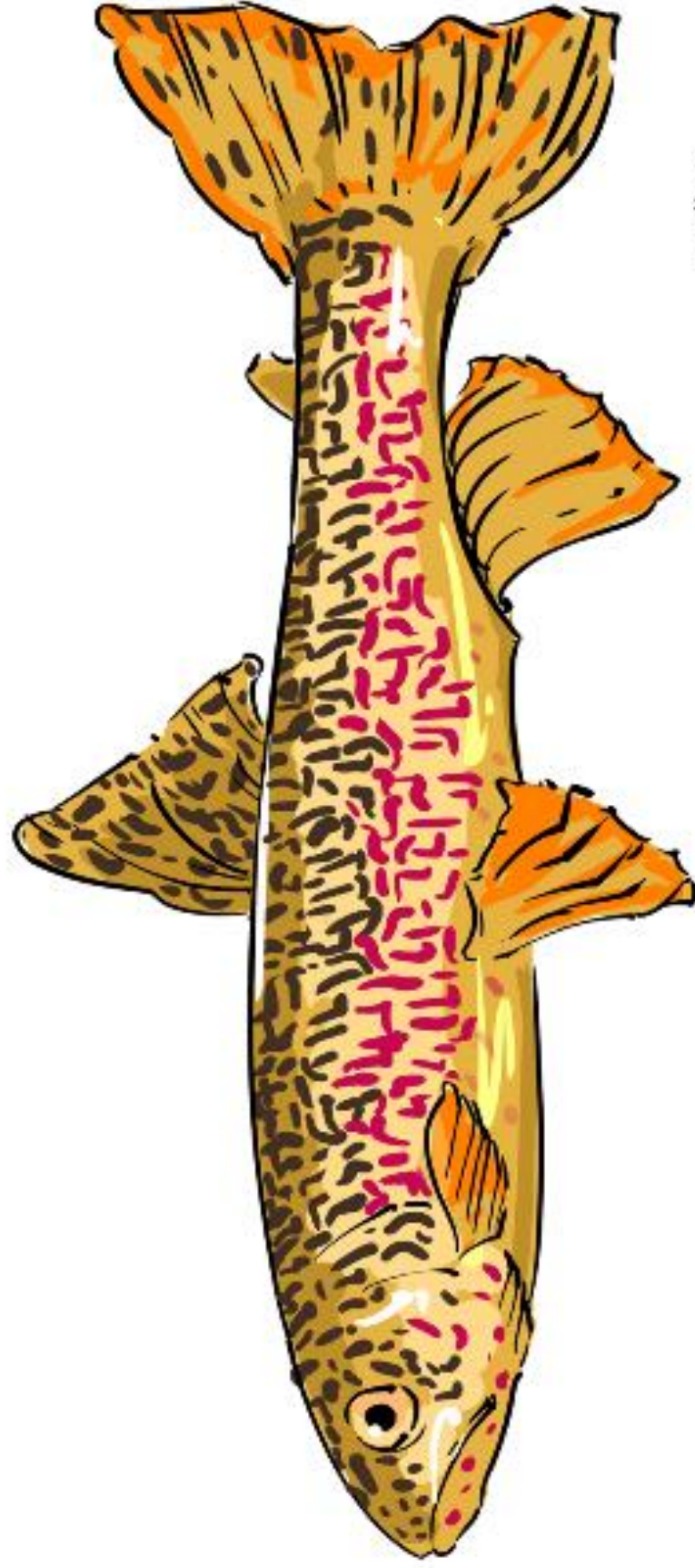
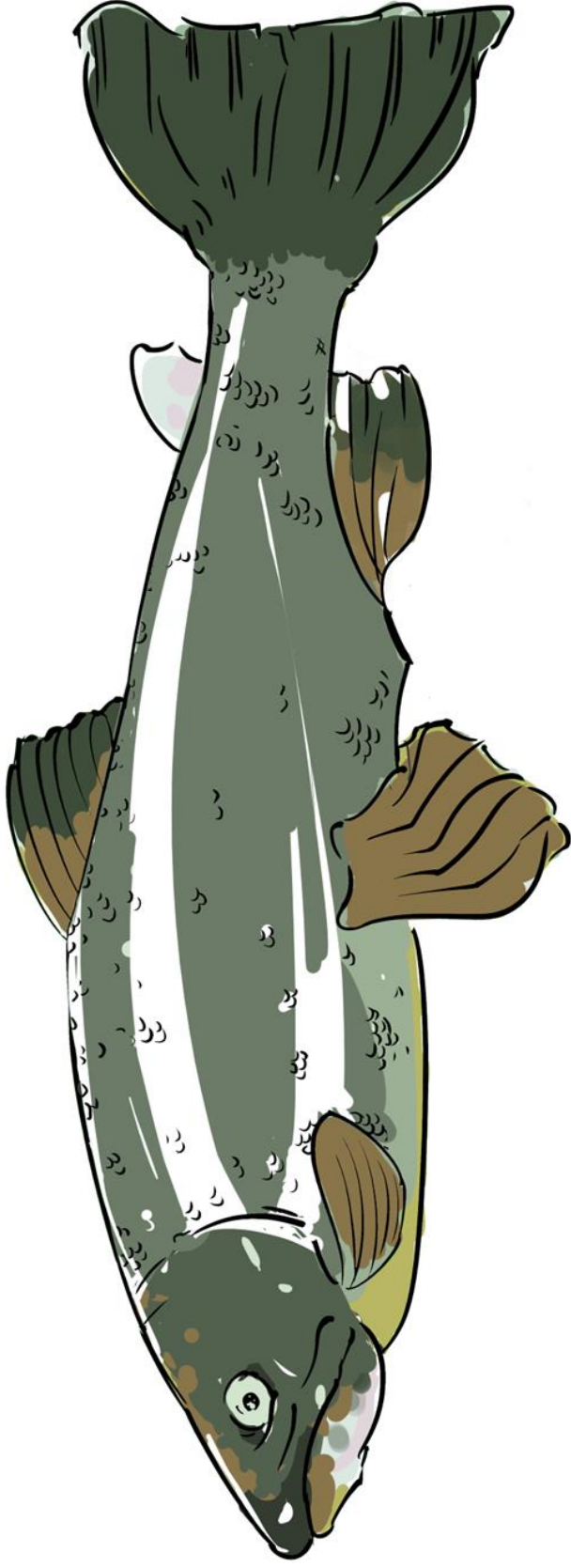


Illustration
by
J. Smith

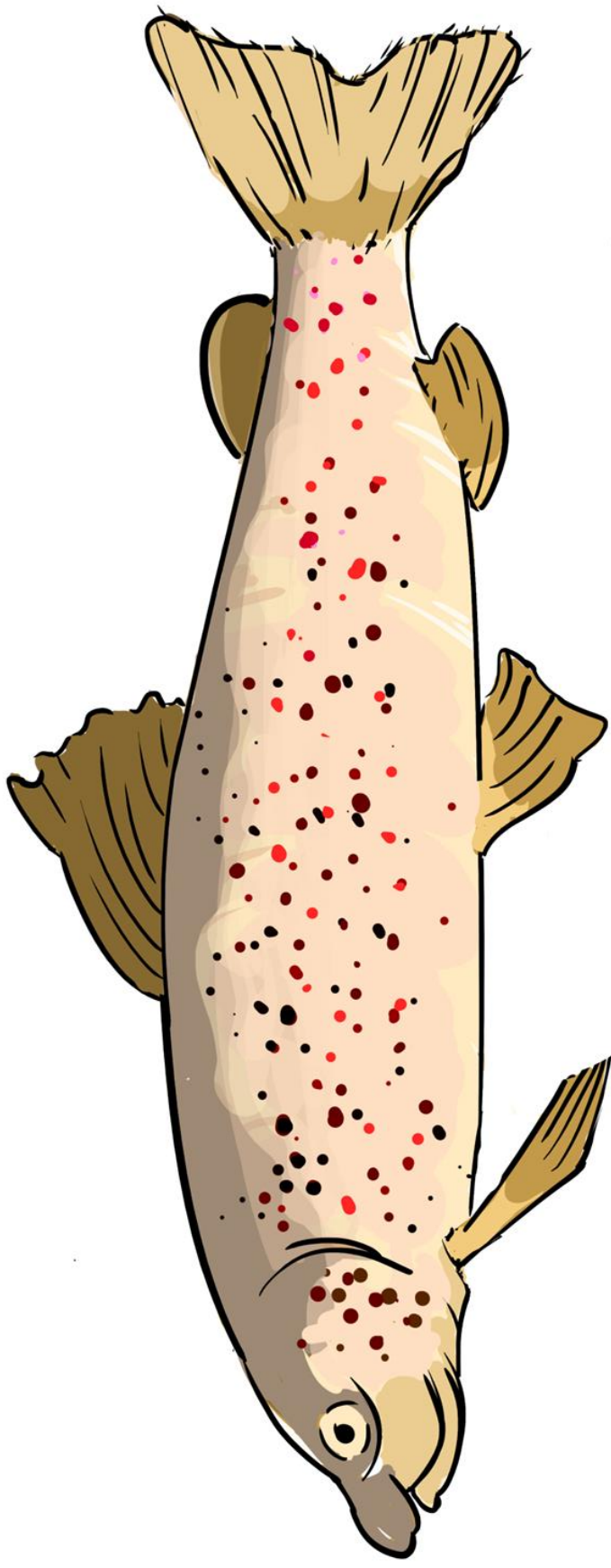
Marmorated Brown Trout, *Salmo marmoratus*

Norway



Sketch
4/15/12

Moroccan Green Trout, *Salmo viridis*
Morocco



Softmouth Trout, *Salmo obtusirostris*
Western Balkans (Albania, Bosnia, Serbia, etc.)



Belvica Trout, *Salmo ohridanus*
Lake Ohrid, Albania & Macedonia

Name: _____

