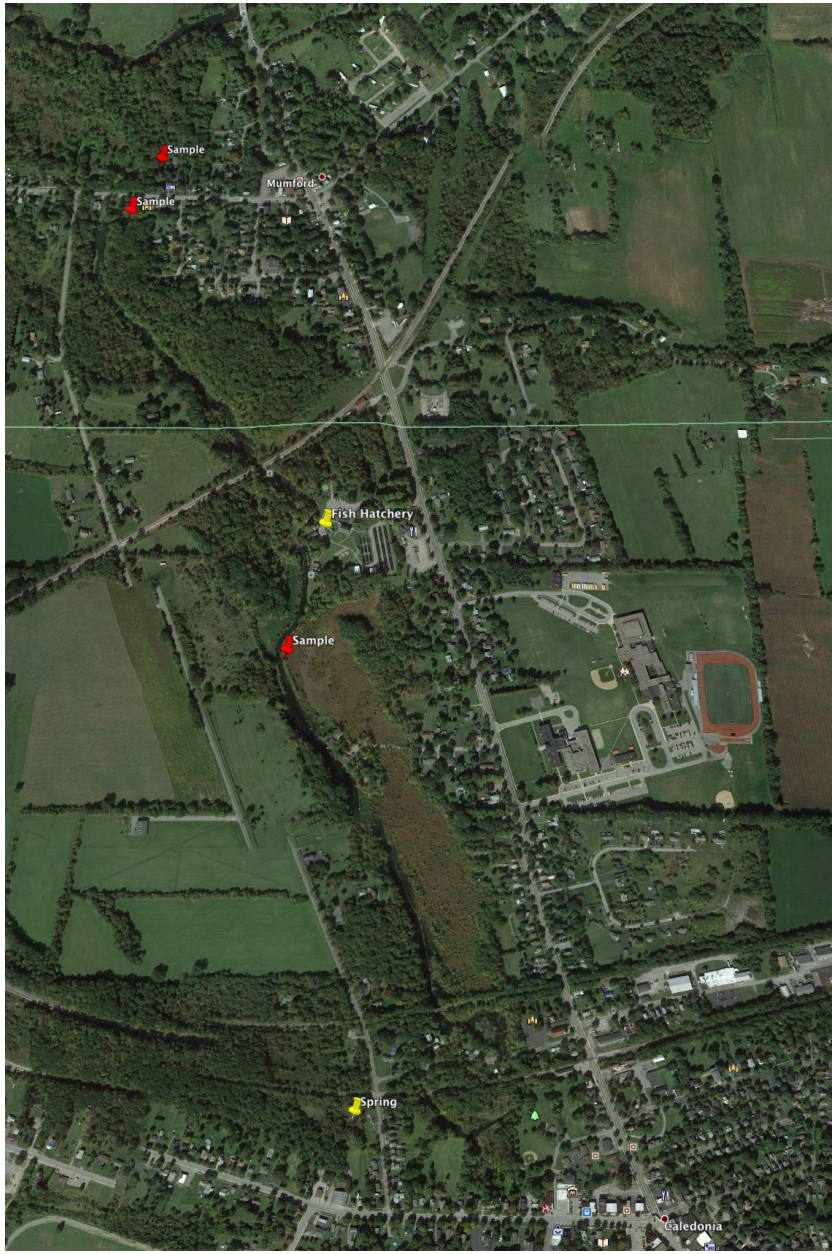
Monsters of Spring Creek

Bobby Gold

The Creek

The creek itself spans between the towns of Caledonia and Mumford New York and is a tributary to the much larger Oatka creek. This area is very well known for it's fly-fishing as well as the oldest fish hatchery in the western Hemisphere, which is controlled by the Department of Environmental Protection (DEP). What makes Spring Creek so unique is the fact that, like the name entails, it is spring fed. This keeps the spring at an average annual temperature of about 52˚F.

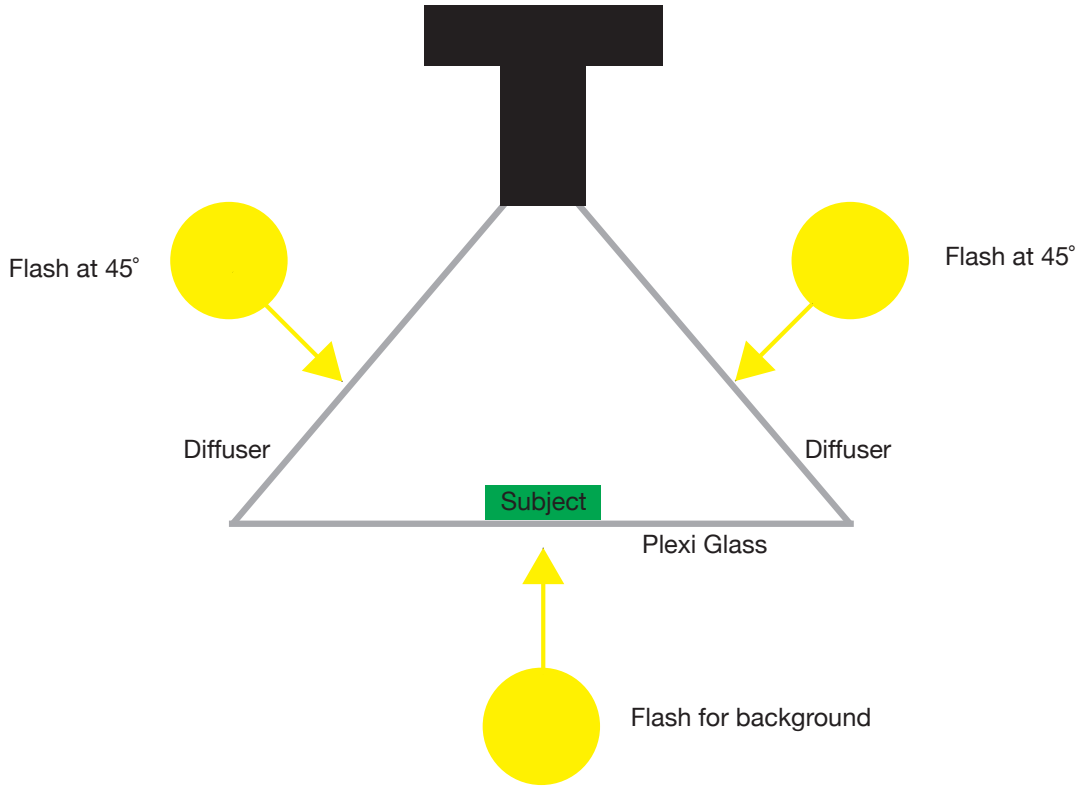
To add on top of the complexity of this ecosystem, the spring itself has formed underneath a limestone deposit, making the water fairly basic, with a pH around 8.5. The heightened pH of the creek provides the aquatic life with the ideal environment to flourish. The pH is just high enough to provide a buffer from acid rain and suppress unwanted vegetation like mosses and algae while remaining low enough to not cause disruption to their bodily functions.



Protocol

Water samples were taken at several points along the creek including at the origin of the spring, the fish hatchery and far downstream, about 1000 feet from the intersection the Spring Creek and Oatka Creek. These samples were not only taken to observe the macro and microorganisms in the water but also to test some of the water qualities such as coliforms and pH. All imaging was done in an off site lab to better control the lighting environment and then the subjects are returned back to the creek.

For imaging specimens up to 5 times life size a Canon 5D mark III was used with either the Canon 65mm macro lens (for images between 1x and 5x) or the Canon 100mm f/2.8L (for images at 1x or less). Two or three flashes, depending on the subject were remotely triggered, with one flash being under the subject with a piece of white plexi glass between to both diffuse the light and create a white background. The other lights were positioned around the subject, with diffusers to provide a relatively flat light. The goal of this lighting arrangement was to completely isolate the subject from its habitat to draw focus to the specimen.



Wolf Spider (*Hogna helluo*)

Habitat

A wide array of climates and habitats ranging from dry arid deserts to aquatic regions.

Diet

Insects and small rodents.

Characteristics

H. helluo is typically 18-21mm long. They have a clearly defined line black medial line running from the middle set of eyes to the joint where their carapace meets their abdomen. The abdomen has a larger, lighter stripe running the edges of its body. Its underbelly is black and sometimes spotted.

Unlike most species of spiders, wolf spiders will live up to several years after laying eggs so they can be found year round. The wolf spider is also not poisonous but their bite can cause a fair amount of mechanical damage, comparable to a bee sting. For the most part they will not attack anything larger then themselves unless absolutely necessary, so bites to humans are rare.

Woolly Bear (*Pyrrharctia Isabella*)

Habitat

Cool Climates, will reach as far north as Alberta, Canada.

Diet

Primarily herbs and forbes.

Characteristics

In it's caterpillar form this specimen is called the woolly bear, the larva will present to either be all black or black with a redish to orange band in the center. The moth form, also known as a tiger moth is typically orange or yellow and has a relatively small, fuzzy body. Their typical wind span is 5 cm.

Wooly Bears are so common they have become subject to many folklore, where each of their middle 13 segments represent a week of winter and each orange band represents a bad week of weather. A woolly bear will emerge from their larva in late fall and spends the winter in its caterpillar form where it will freeze solid. It does this by producing cryoprotectant, which is a substrate used to protect tissue. Once the caterpillar thaws in the spring it will enter the pupate stage and then become a moth.

Brown Planaria (*Girardia tigrina*)

Habitat

Freshwater ecosystems.

Diet

Planaria are a carnivorus species preying on many small isopods, mollusks and insects.

Characteristics

G. tigrina are about 10 mm long and has an equilateral-triangular head with two eyes in the middle surrounded by a large pigment free area. As part of the Platyhelminthes phylum, planarea are bilaterally symmetrical and contain a simple organ system comprised of three tissue layers.

Originally from the Americas, this species of flatworm has been accidentally introduced to Europe as well as Japan. Planaria are capable of both sexual reproduction as well as regeneration, where if an organism is split in half both ends will become a whole new organism. Planaria are considered hermaphroditic and sexual reproduction will only occur is some populations, where two mates will fertilize each others eggs. Due to their regenerative abilities planaria show no sign of degenerative aging.

Backswimmer (*Notonecta insulata*)

Habitat

Small freshwater ecosystems with a preference towards still water.

Diet

Backswimmers are very generalized carnivores eating almost anything they can find. In their juvenile stage their prey of choice is daphnia and zooplankton, where in their adult stage mosquito eggs are preferred. They have also been known to eat small fish and tadpoles.

Characteristics

N. insulate can grow to be up to 18mm long. As their name might suggest, backswimmers swim upside down. They use their long hind legs to propell themselves through water.

To stay submerged under water, *N. insulata* and other members of the genus, will take in extra oxygen, store it the hemoglobin and regulate the ration between oxygen and dissolved nitrogen to stay buoyant. While it is uncommon, backswimmers can also fly, which they only do in the most dire of situation to relocate to a new habitat.

Sow Bug (*Asselus aquaticus*)

Habitat

Common in temperate zones of Europe and North America. Found in fresh water rivers and streams and still water.

Diet

Decaying debris and plants.

Characteristics

Sow bugs are generally 1 cm long and their body contains several segments. They have several pairs of legs and two pairs of antenna.

A. aquatucus's reproduction cycles is heavily influenced by the climate in which they inhabit. They will bread throughout the year provided temperatures are high enough. The maturation process can take up to two years, in cold climates and their average life span is between 9 months in warmer climates and 20 months in cooler climates.

Water Strider (*Aquarius remigis*)

Habitat

Still freshwater ecosystems. Water temperatures around 70˚F are preferred.

Diet

Water Striders are a predatory species that will feed on mosquito larva under the surface of water and other, mostly dead insects on the surface. Zooplankton are commonly consumed as well.

Characteristics

A. remigis will grow to be about 0.5 inches long and have elongated legs. They have a dark brown body with black speckles. Water striders also have retractable claws and a rostrum, a needle like structured used to pierce prey and suck out the insides.

Water strides have several adaptations, which allow them to walk on water. They will use water tension to support themselves on the surface in combination with a hydrophobic layer on the bottom of their feet, creating further repellant. The length of their legs also works greatly to their benefit, allowing for even weight distribution. Further, water striders are coated with tiny hydrofuge hairs, which will make water roll off of their body, cutting down any additional weight.

Scud (*Gammarus lacustris*)

Habitat

Still and slow moving waters in temperate regions. Scud tend to follow the thermocline of water.

Diet

Being detritivores , *G. lacutris* will consume mostly decaying matter. They will also eat algea and diatoms.

Characteristics

Often mistaken for shrimp, scud will grow to be about 10mm long. *G. lacutris* have a fused cephalothorax and seven abdominal segments. Unlike most other crustaceans, this species of scud lack a carapace, a piece of exoskeleton that covers the head. They also have two sets of antennae. *G. lacustris* is semi-transparent and usually clear, brown red or blue depending on the environment.

Gammarus lacustris and most other species of scud are considered to be indicator species. Meaning that they define a trait in an ecosystem and are capable of detecting even slight changes. Scuds are particularly sensitive to heavy metal pollution as well as pesticides. They are also extremely sensitive to dissolved oxygen concentrations in the water.

Diving Beetle (*Acilius semisulcatus & Graphoderus liberus*)

Habitat

Freshwater ecosystems.

Diet

Diving Beetles are carnivorus, eating anything from small insects to fish larger then themselves.

Characteristics of *Acilius semisulcatus* (top):

Color is not a very accurate way to identify members of the *Acilius* genus. Instead patterns are used in identification. One predominant marking on *A. semisulactus* is the “M” shaped marking on its head. This genus of diving beetle also has long hind legs, fringed with setae, hair like structures. When spread these setae will form a paddle like structure and aid the beetle in swimming. *A. semisulactus* will also have suction cups present around their mouth area, which are used for holding on to females during mating.

Characteristics of *Graphoderus liberus* (bottom):

G. liberus will grow to about 12mm long. Unlike other members of the genus, this species lacks a dark band on the pronotum. The middle leg’s femur will have a series of stiff setae that are about half as long as the femur itself.

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