van cortlandt park alliance

Benthic Macroinvertebrates of Freshwater Systems in New York City

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BIVALVIA- Clams and Mussels

- Filter Feeders
- High amounts of calcium carbonate in the water favors more bivalves
- For many kinds of the larger Unionidae species of mussels, reproductive capabilities may not be ready for several year, and some species can live 10-20 years, while one is known to live for 100 years.

Found in VCP

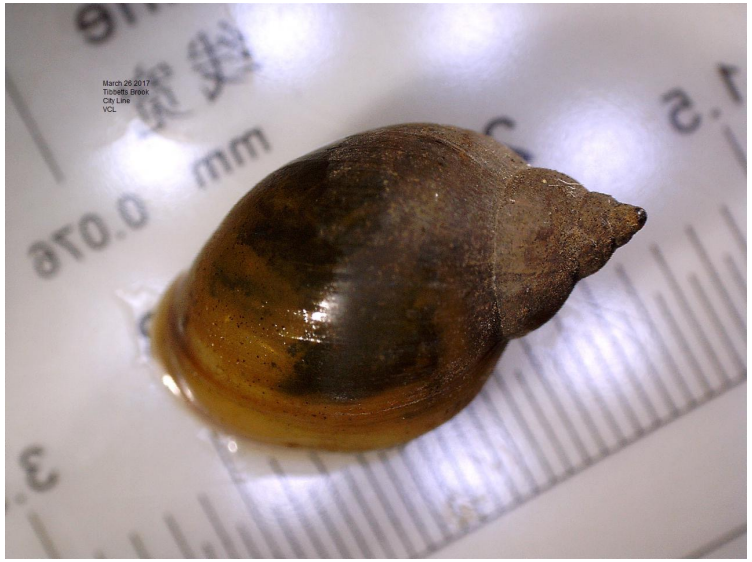
- Sphaerium sp.

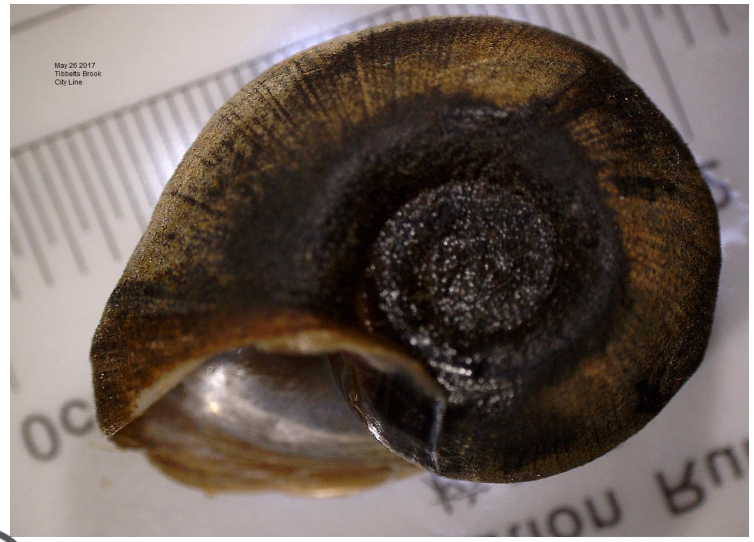
- Musculium sp.

- Pisidium sp.

- Anodonta cataracta- Eastern floater

GASTROPODA -Snails





Found in VCP:

- *Physella sp.- bladder snails*
- *Planorbella sp.- ramshorn snails*
- *Gyraulus sp.-ramshorn snails*
- *Viviparus georgianus- Banded mystery snail*
- *Cipangupaludina chiensis- Chinese mystery snail*

HIRUDINEA- Leeches

Distinguishing Characteristics:

- Flattened body
- Very muscular
- Segmented body
- There are two distinct suckers on the body, one on the top at one at the rear
- Almost all have some pattern and are generally brightly colored

Found in VCP

- *Helobdella sp.*
- *Erpobdella sp*.

DECAPODA-Crayfish

Distinguishing Characteristics:

- 5 pairs of walking legs, with claws on the first three
- First pair of claws are greatly enlarged and hardened
- The end of the body has a large flipper

Found in VCP

- Procamberus acutus- White River Crayfish

- Orconectes limosus- Spiny-cheek Crayfish

AMPHIPODA- Scuds or Sideswimmers

Distinguishing Characteristics

- Body strongly flattened from side to side
- Seven pairs of walking legs on the thorax
- Appendages are present underneath the abdomen

Found in VCP

- *Dexamine thea*
- *Gammarus sp.*
- *Crangonyx sp.*

ISOPODA- Sowbugs

Discover Earth

Distinguishing Characteristics:

- Body strongly flattened from top to bottom
- Two pair of antennae, one much larger than the other
- Seven pairs of walking legs
- All thorax segments have a shelf like projection on it covering the base of the legs

Found in VCP

- Asellus sp.
- Caecidotea sp.

ODONATA-Dragonflies and Damselflies
Damselflies (Zygoptera)

Diagnostic Characteristics

- **labium is long and elbowed, folded back against head when not feeding**
- **Wing pads present on thorax**
- **Head wider than thorax and abdomen**
- **Body elongate and slender**
- **Three flat gills project from rear of abdomen**

Found in VCP:
Enallagma divagans- Turquoise bluet
Enallagma antennatum- Rainbow bluet*
Enallagma signatum- Orange bluet
Ischnura sp.- forktails
Calopteryx sp.- jewelwing
Amphiagrion saucium- Eastern red damsel*

Photos: Enallagma divagens nymph and adult

ODONATA- Dragonflies & Damselflies Dragonflies(Anisoptera)

Diagnostic Characteristics

- **labium is long and elbowed, folded back against head when not feeding**
- **Wing pads present on thorax**
- **Head is narrower than thorax and abdomen**
- **No gills found at the end of the abdomen**
- **Abdomen ends in three short stiff points**

Found in VCP:
Anax junius- Common Green darner
Aeshna sp.-Hawker *
Arigomphus villosipes- Unicorn clubtail
Dorocordulia sp.- Little emerald *
Erythemis simplicicollis- Eastern pondhawk
Perithemis tenera- Eastern amberwing
Plathemis lydia- Common whitetail
Nannothemis bella- Elfin skimmer *

Ephemoptera- Mayflies

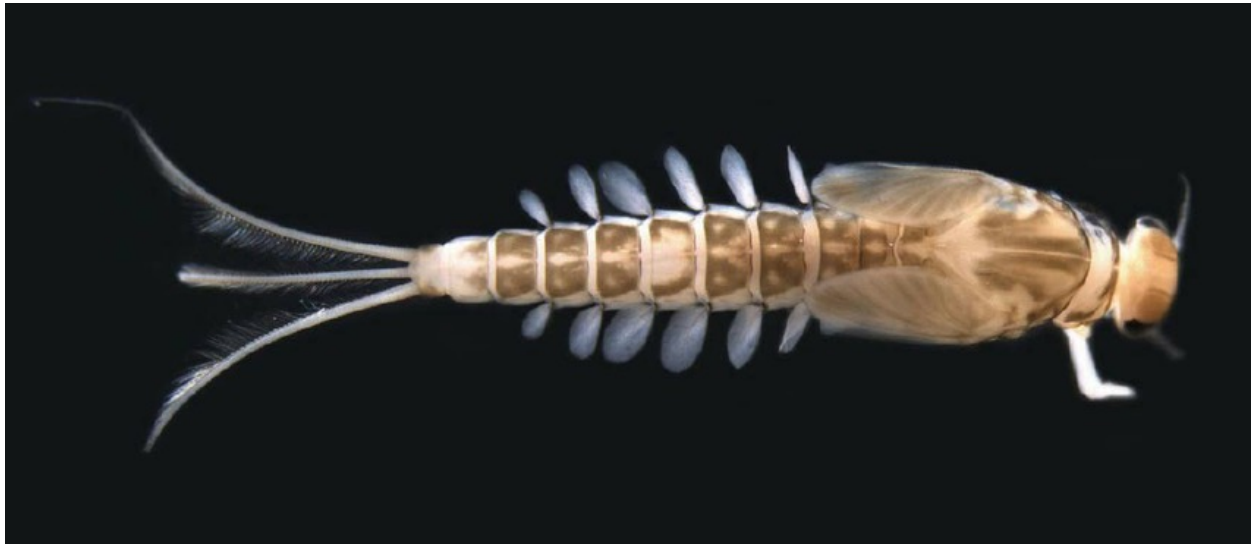
Distinguishing Characteristics:

- Generally 3 long tails occur at the end of the abdomen
- Gills are attached to the sides of the abdomen but sometimes extend over the top
- Gills consist of either flat plates or filaments

Found in VCP

Caenis sp.- Small squaregill mayflies

Baetis sp. – Small minnow mayflies



Photos: Caenis and Baetis sp. nymphs and Caenis adult

Plecoptera- Stoneflies

Distinguishing Characteristics:

- Two long thin tails at the end of the abdomen
- Wing pads generally present on larvae
- Gills are either single or branched filaments, or there are no gills


Michigan State Uni.


Bugguide.net

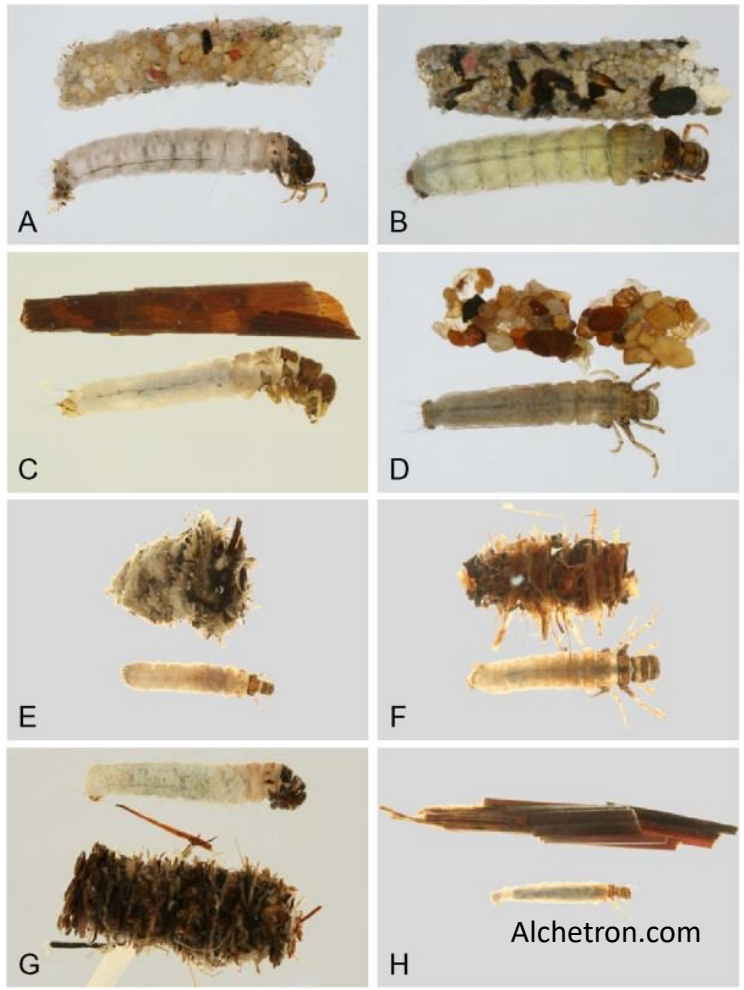

Friends of the Rouge

TRICOPTERA- Caddisflies

Distinguishing Characteristics:

- Resemble caterpillars
- Antennae usually not visible
- Top of first thorax segment has hardened plate
- Larvae live in various types of portable cases except for one family
- Some have single or branched gills on the abdomen, and some have no gills
- A pair of prolegs with one claw attached to each is at the end of the abdomen

Found in VCP:
Hydropsychidae species- Netspinners
Limnephilidae species- northern casemakers




Macroinvertebrates.org

MEGALOPTERA-
Hellgrammites/ Dobsonflies

Diagnostic Characteristics:

- Large and elongate
- Head large with robust toothed jaws
- Abdomen segments each have a stout, pointed filament that project out to the side
- The end of the body has a pair of appendages (prolegs) that project near the rear

Found in VCP-
Chauliodes rastricornis- Spring fishfly

Facts:

- Active predator and scavenger
- Will burrow on shoreline
- Places eggs on vegetation and rocks
- 10-12 instars
- Respiratory tubes used in identification
- Have been known to eat vertebrates such as fish

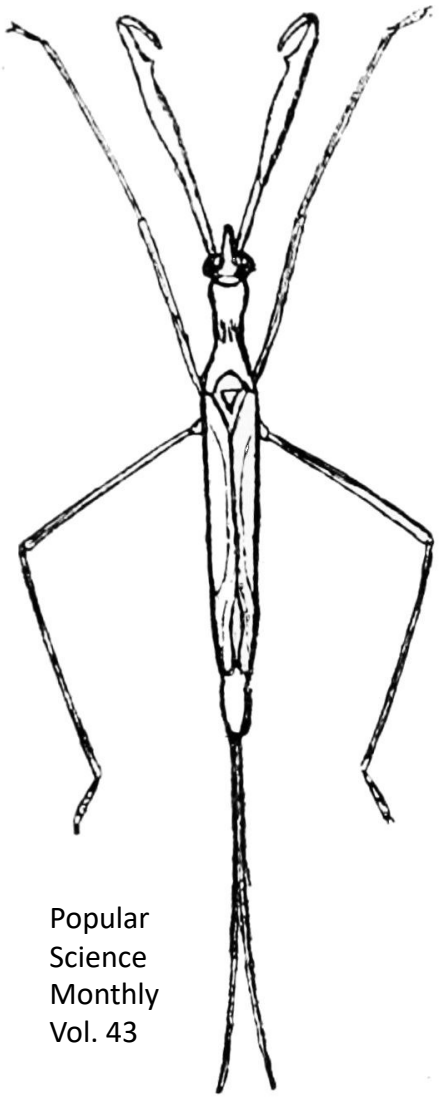
HEMIPTERA- True Bugs
Giant Water Bug

Diagnostic Characteristics
- Broad oval body with narrow head
- End of abdomen has two appendages used for breathing air
- Front wings has visible veins
- Tubelike beak pierces prey

Facts:
- Venomous
- Males brood and oxygenate eggs
- Can prey on vertebrates
- Strong fliers

Found in Van Cortlandt Park- *Belostoma sp*.

HEMIPTERA- True Bugs
Water Scorpions



Popular Science Monthly Vol. 43

Diagnostic Characteristics

- Long cylindrical bodies
- End of abdomen has two long appendages used for breathing air
- Tubelike beak pierces prey
- Eyes generally protrude outward

Found in VCP- Ranatra sp

HEMIPTERA- True Bugs
Water Boatmen Vs. Backswimmers


Stephen Luk @ pbase

Diagnostic Characteristics:

- Water boatmen are generally smaller than backswimmers
- Water boatmen are usually darkly colored with yellow lines on the top and lighter colored on the bottom
- Backswimmers are usually dark on the bottom and lightly colored on top as they swim upsidedown


Bugguide.net


Aphotofauna.com

Water Boatmen Found in VCP- Trichocorixa sp.

Backswimmers Found in VCP- Notonecta sp.

COLEOPTERA- Beetles

- Beetle larvae differ greatly from adults

Found in VCP:

- ***Peltodytes sp.- Crawling water beetles***
- ***Cybister sp.- Predaceous diving beetles***

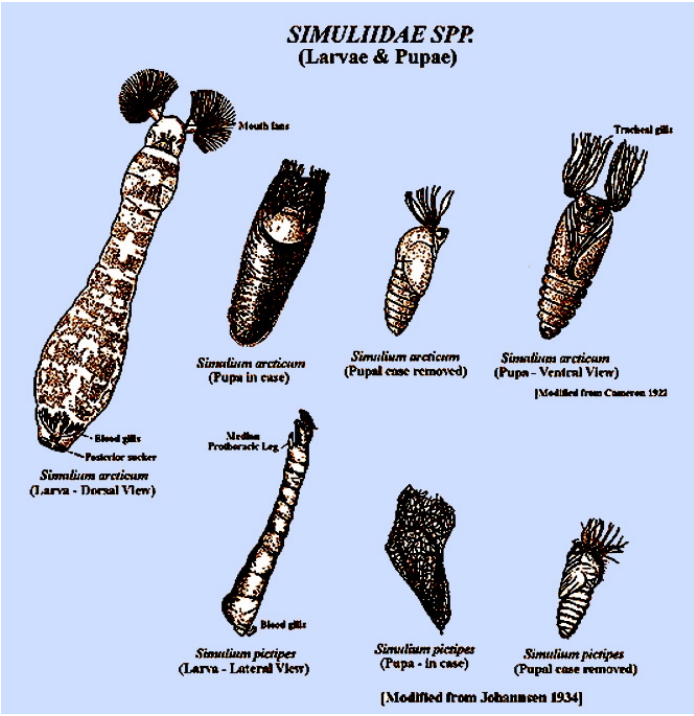
DIPTERA- True Flies

INSECTA

Found in VCP
- Simuliidae: Black Flies (biting)
- Chironomidae: Midge Flies (non-biting)

Distinguishing Characteristics for Black Flies:
- Two large clumps of hairs on the top of the head, they can be opened or closed
- Have an aquatic pupae phase before becoming an adult
- The rear one third of the body is enlarged

Photo courtesy of BLM/USU National Aquatic Monitoring Center



Distinguishing Characteristics for Chironomids:
- No hair on head
- Narrow and elongate body
- Have aquatic pupae
- Some species are bright red, but not all

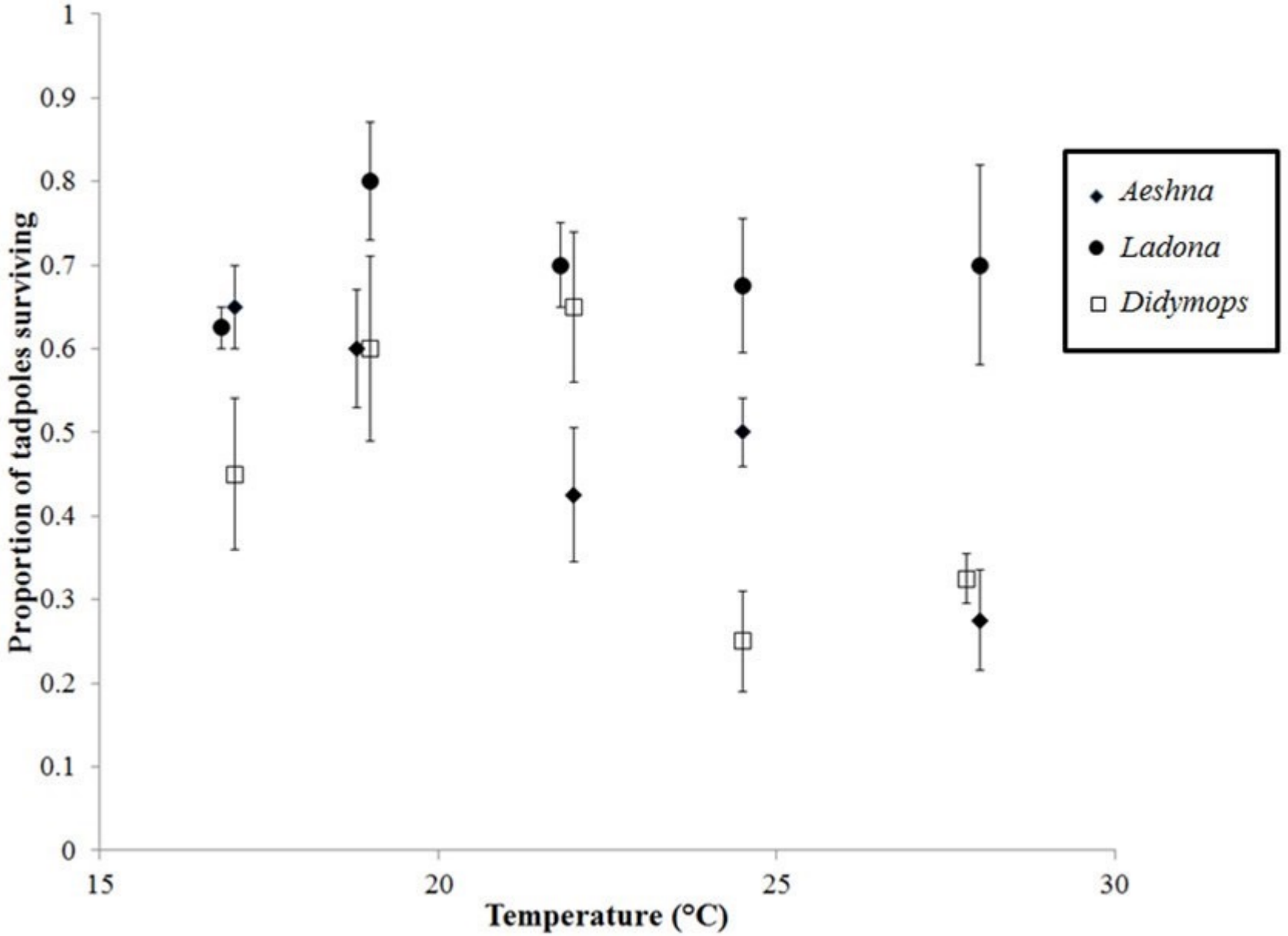

Research

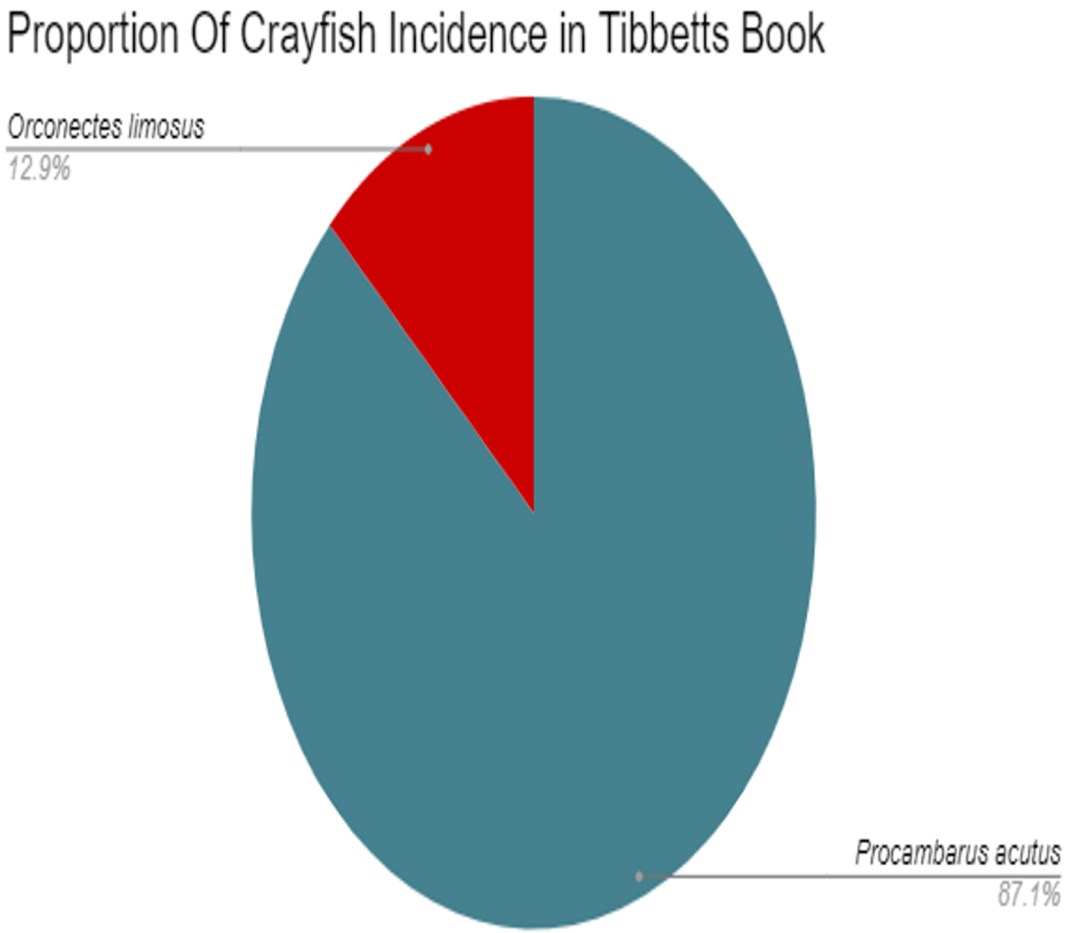
EFFECTS OF WATER TEMPERATURE ON LARVAL AMPHIBIAN PREDATOR-PREY DYNAMICS

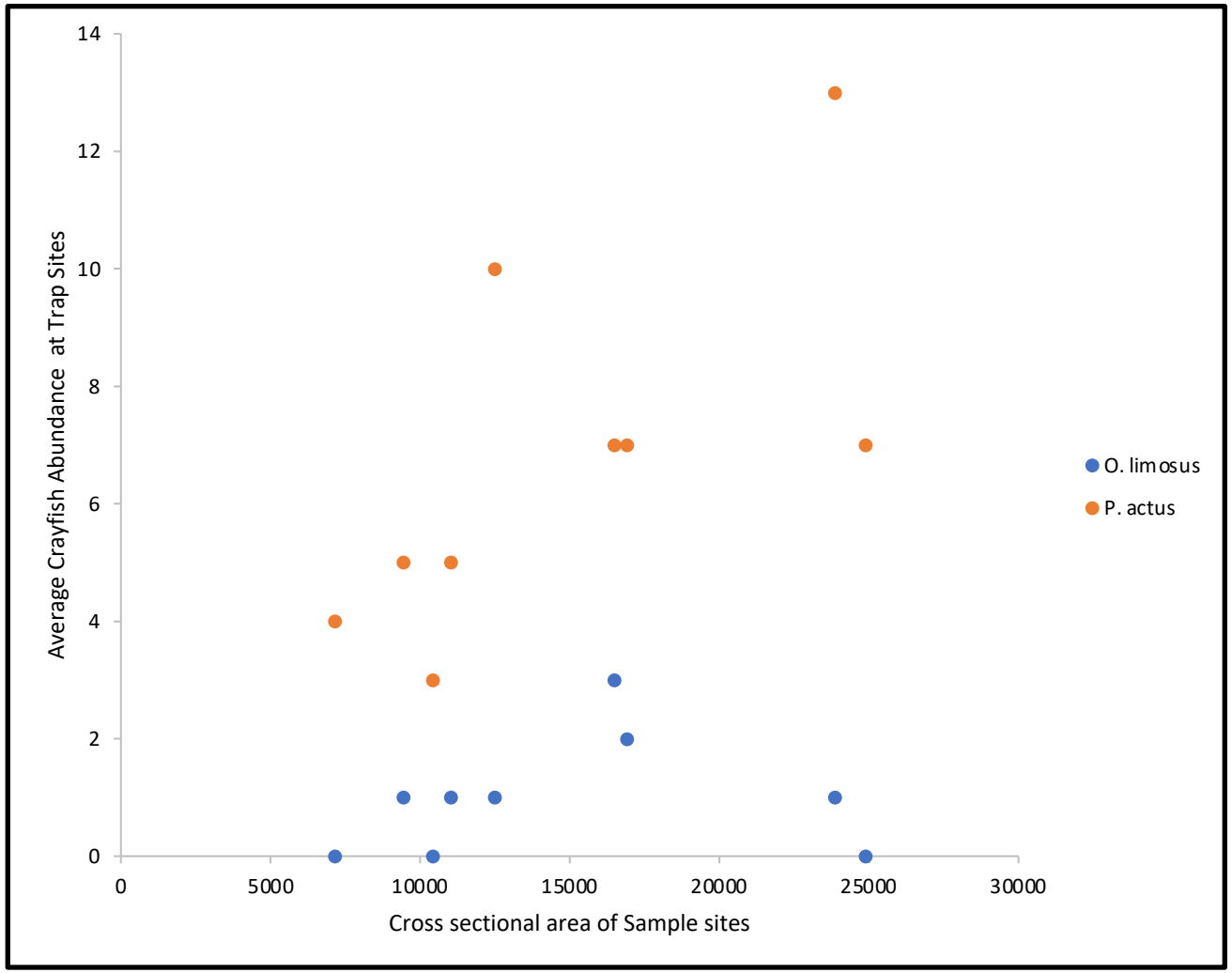
Temperature modulates Predation success in Odonate naiads.

Different Odonate species respond differently to increasing temperature

Based on this data, Darner dragonfly species will benefit most from increased temperatures associated with Climate Change.




Proportion Of Crayfish Incidence in Tibbetts Book
Orconectes limosus
12.9%
Procambarus acutus
87.1%


Average Crayfish Abundance at Trap Sites
Cross sectional area of Sample sites
0
2
4
6
8
10
12
14
0
5000
10000
15000
20000
25000
30000
O. limosus
P. actus

Experiments have provided evidence that Crayfish can shift their color to match substrate color

Freshwater Mussel Nutrient Removal Studies

Removal
Control < 0.001 mg/L-hr (no removal)
Tank = 0.032 mg/L-hr
Mesocosms = 0.021 mg/L-hr
(Comparable to Exp. 1)

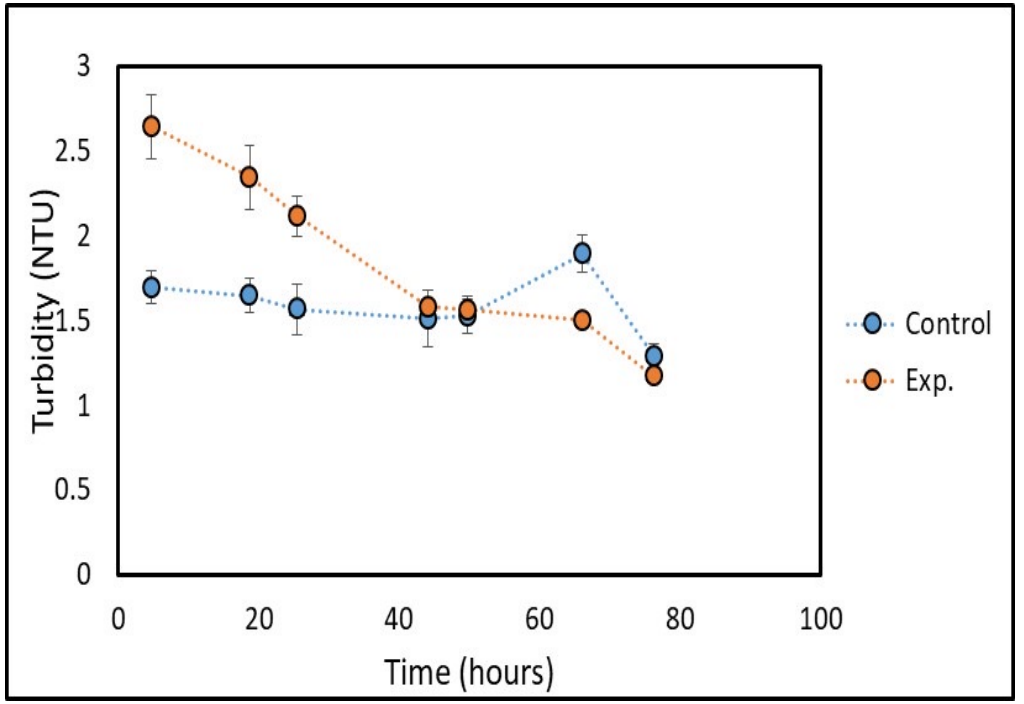
Higher rate of phosphorus removal for tank mesocosms when compared to control

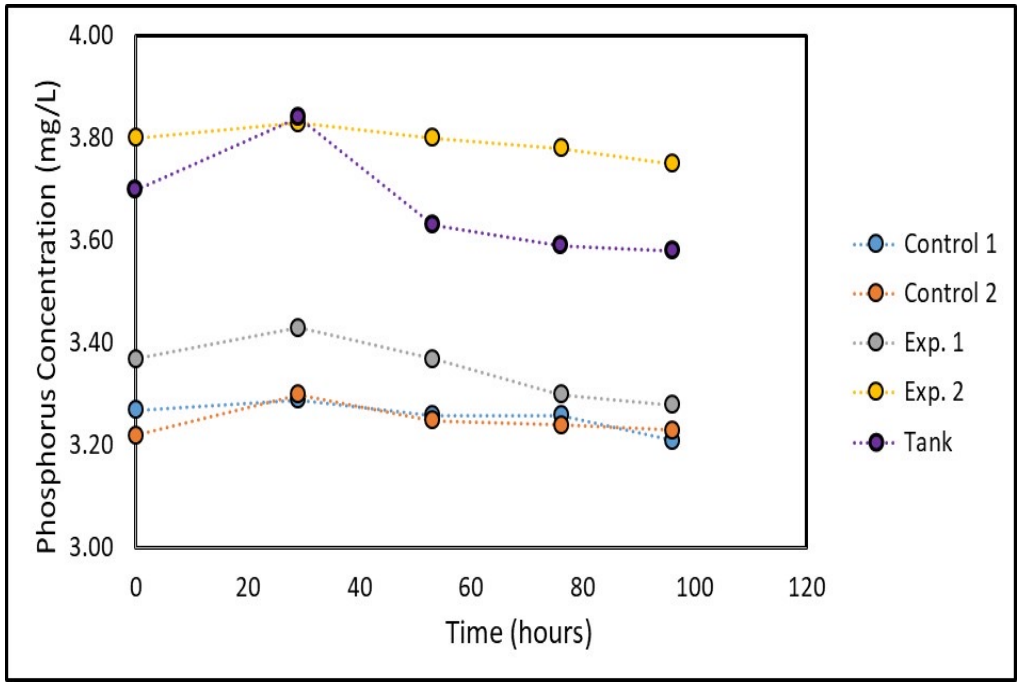
Removal

Control = 23% removal

Mesocosm = 56% removal

Higher average amount of turbidity removed for experimental than control





Field Sampling Methods

- Active sampling:
  - D-frame Dip Nets
  - Rectangular Kick Nets
  - Hand Picking
- Passive Sampling
  - Leaf Packs
  - Hester- Dendy Multiple Plate Samplers