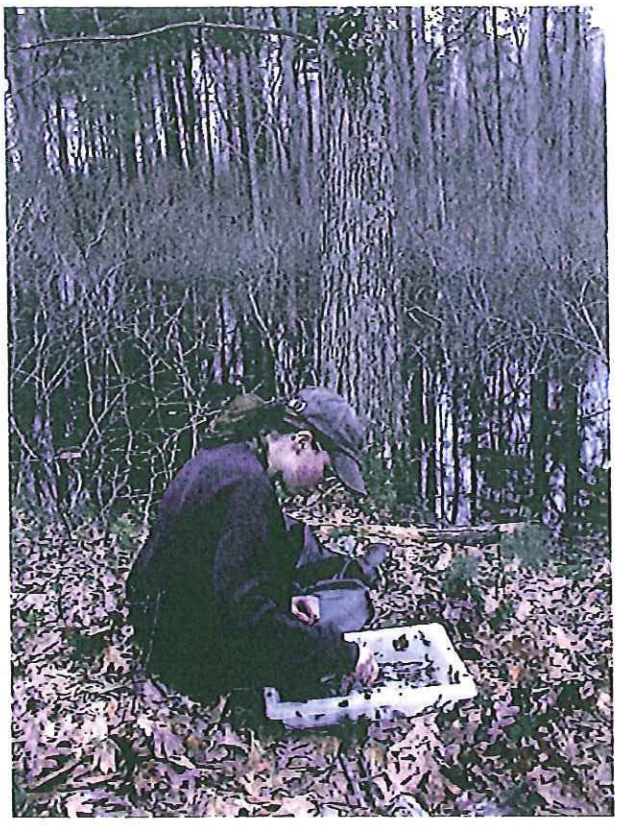
SESSION WOODS WILDLIFE MANAGEMENT AREA

Vernal Pool Invertebrate Report

Report Prepared for the DEP Wildlife Division



By

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Introduction

A small vernal pool located at 41° 43' 48'' Longitude and 72° 58' 01'' Latitude in Session Woods Wildlife Management Area was studied for a period of several springs and summer between 3-31-95 to 7- 25-02.

During that time several invertebrate collections were collected and a number of chemical parameters tested and recorded. The original intent was to collect crustaceans from the pool for a statewide inventory, but as all other macroinvetebrates were taken I have prepared a small report to provide the Session Woods Wildlife Management area with additional macroinvertebrate information.

Analyses of these collections are based on other collection taken at other vernal pools located in other areas in New England and past research completed by me at other locations.

Physical Descriptions

This vernal pool is located with in a mix deciduous forest habitat adjacent to the main hiking trail. The vernal pool is used as an education site, and small trail lead to the pool from the main trail. A small platform was erected to improve the view for the general public.

The pool substrate is composed of a number of leaves, twigs, grasses, and soil. Inside the pool there are a number of small shrubs and it is surrounded by deciduous trees about 10'' in diameter. The total pool area is about 300 sq. ft.

Hydrology

The pool is rain feed especially during the spring. This pool was empty at the end of the summer and remained empty during the early fall. At the end of the fall and during the winter it would gain some water, so that during the winter a small sheet of ice would be found on the bottom. In the very early spring a small amount of water would be found in the pool. There are no inlets and there are no outlets.

Chemistry

Basic chemistry parameters were taken on 3-31-95, on 4-14-95, on 5-7-95, on 5-9-95, on 5-9-95, on 5-20-95, on 11-10-95, on 4-6-96, on 6-18-99, and on 4-12-2000. Not all parameters were tested each time. Here are the results from these tests.

Date	DO	T° C	pH	NO_3	PO_4	HNO_4
3-31-95	6.0	7.1	5.2	.02	.023	
4-14-95	6.8	12.2	5.1	.00	.04	
5-7-95	6.2	12.6	5.3			
5-9-95	7.3	15	6.6			
5-9-95	6.1	17.8		0.0	0.06	

5-10-95					.3	
5-20-95	3.7	17.3	4.7	0.0	.06	
11-10-95	6.2	4.0	4.7	0.0	0.0	
4-6-96	7.8	4.5	6.2	0.0	0.06	
6-18-99	2.7	17.0	4.4			
4-12-00	7.2	9.1	4.9	0.02	0.02	0.03

Dissolved Oxygen
Because this pool is a very small and shallow, dissolved oxygen levels in the spring and summer reflects temperatures. Early in the day oxygen levels are high as the water is cool from the night before but as the day advances the water looses its oxygen as it warms up. Due to its shallow nature dissolved oxygen levels can be very low.

pH
pH levels are low in the spring and fall, staying on the acidic side. It is interesting that this pool has optimal or neutral pH conditions during the animal-breeding season.

Nutrients
All nutrients tested very low. It is interesting to see that Nitrates and Orthophosphates stay low even when it is obvious that during the fall there is lots of decomposition. Nutrients are probably absolved by the primary producers that happen to be there during the spring and summer.

Additional chemistry could prove that vernal pools reach optimal chemistry levels during the spring active season. This would make these habitats the smallest self-regulation habitats on earth.

Dissolved Oxygen and Temperature levels were obtained using a YSI instrument. pH was obtained using a LAMOTTE pH meter calibrated for 7.0 and 4.0 before each testing date. Nitrates, Orthophosphates, and Ammonia were tested using the LAMOTTE Colorimeter. This colorimeter is less accurate at very low levels. So any tests with less that 0.05 ppm are only approximations. Levels written as 0.0 are numbers < 0.02 ppm.

Invertebrate Collections
Below you will find a listing of all macroinvertebrates found and collected during the study. All crustaceans were identified to the genus and species level. Most insects were identified to the genus level.
After each collection date I have included some of my notes regarding the collection. These notes are shown as comments.

DATE 4/14/95

1	Megaloptera	Corydalidae	*Chanlindes Lateille*
1	Trichoptera	Phryganeidae	*Agrypnia Spp.*

8	Diptera	Culicidae	*Orthopodomyia Spp.*
2	Anacostraca	Chirocephalidae	*Eubrachipus Vernalis*
3	Isopopda	Asellidae	*Caecidptea Communis*
3	Coleoptera	Scirtidae	*Cyhon Spp.*

Comments:
Megaloptera (Corydalidae) (*Chauliodes*)
Fish Flies and Dobsonflies
Occurs in quiet pools of streams, ponds or intermittent forest pools. Under leaf detritus and shallow lakes. Can obtain atmospheric Oxygen via a pair of elongated breathing tubes that contact the air/water interface.

Tricoptera (Phryganeidae) (*Agryphia*)
Giant Case Makers
Omnivorous. At an early state feeding on plant material and during their last instars totally predatorily.

Diptera (Culicidae) (*Orthopodamyia*)
Mosquitoes
Typical of Lentic Waters. Capable of breathing through a siphon, atmospheric Oxygen.

Anastraca (Charocephalidae) (*Eubraquipus vernalis*)
Fairy Shrimp
This fairy shrimp is typical of vernal pools.

Isopoda (Aselidae) (*Caecidotea Communis*)
Very Common in Connecticut in eutrophic habitats. Capable of surviving at very low Oxygen levels.

Coleoptera (Scirtidae) (*Cyphon*)
Marsh Beetles
These beetles are associated with marshes and other wet places. Living under leaves and in small ponds on the vegetation. Not a common Insect.

Comments
Here I find no surprise, as all these organisms belong to habitats such as vernal pool where they were collected.
Culicidae is still operating. All the insects are able to withstand oxygen deficiency. This fact may me think that oxygen may be a limiting factor during the day.

DATE 5/9/95

5	Diptera	Chrironomidae	*Dodonamidae Spp.*
5	*Isopoda*	*Aselidae*	*Caecidotea* Communis
2	Hemiptera	Corixidae	*Cymatiinae Spp.*
1	Odonata	Lestidae	*Archlestes Spp.*

Comments
Corixidae – a very common insect, therefore it will make sense to be also here. It is capable of standing pollution. Lestidae – Archilestes is found in streams and deserts. Deposits eggs on trees.

DATE 4/11/2001

4	*Isopoda*	*Aselidae*	*Caecidotea* Communis

DATE 4/25/2001

25	Anatraca	Cherocephalidae	*Eubriquipus vernalis*
1	Hemiptera	Notonectidae	
6	Isopoda	Aselidae	*Caecidotea communis*

DATE 5/17/2001

4	Isopoda	Aselidae	*Caecidotea communis*
5	Diptera	Culicidae	
5	Diptera	Chironomidae	
3	Hemiptera	Nolonectidae	
2	Diptera	Tipulidae	
1	Diptera	Tabunidae	

Comments:
Notonectidae over winters as adults above the ice and in many occasions in the substrate.
Tipulidae: Craneflies may be aquatic and semi-aquatic habitats, preferring marginal and moist areas.
Most aquatic larvae are aerophneustic utilizing the posterior spirals for obtaining air.
Although those occur in well-oxygenated waters they may also obtain oxygen through their body walls for extended periods of time.
Some genus (Anocha) is hydropneustic and larvae open spirals. Pupae on antocha and lipsothrix apparent adaptations for living in streams environments subject to periodic drying or inundations by water.
Most spp have a pre-year life cycle. Active predators to periphyton feeding.
Tabnidae: Horse or deer flies. Aquatic and semi-aquatic habitats. Tabanos are more typical of marshes and swamps.
Some spp can be terrestrial and semi-aquatic most predatory.
Future Research:
It would be important to monitor what kinds of amphibians breed on this pool. The use of sodium chloride on roads in New England affects pools close to roads. This pool is far from any road and could be used as a comparatives site for studies done on other pools nearby.

References:

Colburn, Elizabeth A. (2004)."Vernal Pools. Natural History and Conservation". The McDonald & Woodward Publishing Company. Blacksburg, Virginia.

Merritt R. W., K. W. Cummins. (1996). "An Introduction to the Aquatic Insects of North America" Kendall/ Hunt Publishing Company. Dubuque, Iowa.

Mimo, Alberto F. (1989). "New Records for Asellus in Connecticut". Natural History, Connecticut Geological and Natural History Survey. Notes. Vol. 3 No. 1.

Mimo, Alberto F. (2002). "Freshwater Crustaceans of Connecticut" The Amature Naturalist, Prospect. CT.

Mimo, Alberto F. (1990). "Distribution and Ecology of the Freshwater Isopods (Caecidotea) in Connecticut". Unpublished

Smith, Douglas G. (1991). "Keys to the Freshwater Macroinvertebrates of Massachusetts" Department of Zoology. University of Massachusetts. Amherst, MA.

Voshell, J. Reese Jr. (2002). "A guide to Common Freshwater Invertebrates of North America" The McDonald & Woodward Publishing Company. Blacksburg, Virginia.