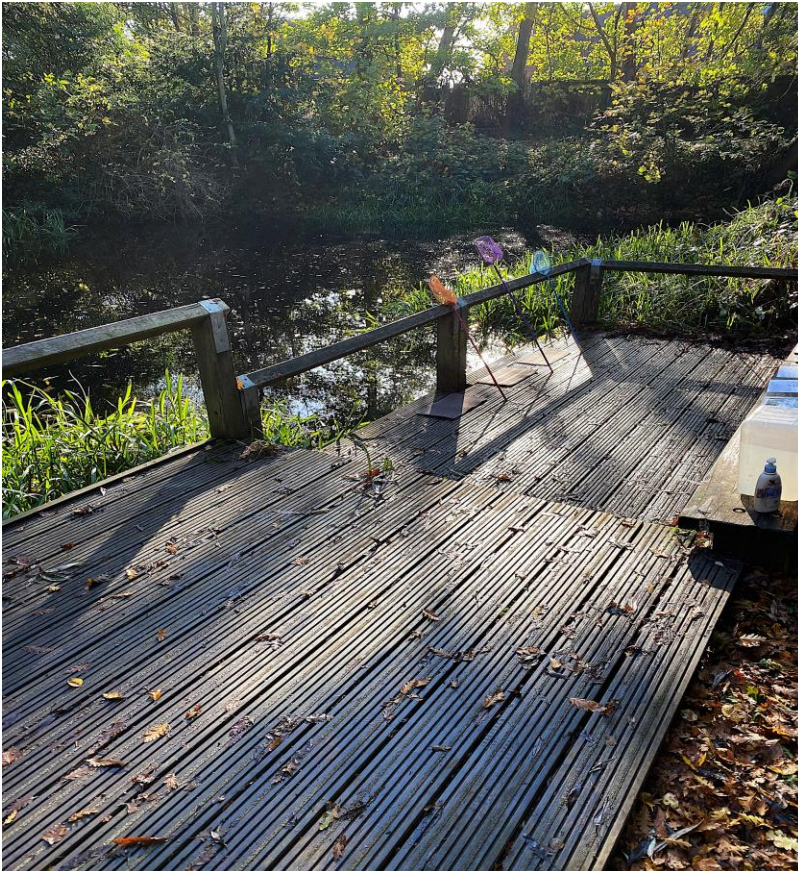


# INVERTEBRATE SURVEY

## AT DACRES WOOD NATURE RESERVE

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### ABOUT THE POND



The pond is located near the entrance to the wood and has a bridge that leads to the dipping platform, where a weekly pond dipping study is being conducted by Free We Grow.

The pond has deeper water at its centre, and towards the northern end, it becomes shallower with an extensive area of thick marshy growth ([dacreswood.org.uk](http://dacreswood.org.uk)).

### ABOUT THE SURVEY

Preliminary invertebrate surveys were conducted in 1996 and 2009 in order to record what type of animals were living in the water and discover the water's health of the pond ([dacreswood.org.uk](http://dacreswood.org.uk)). The 2009 survey was conducted in spring, where the invertebrate fauna was sampled on one day at different locations of the pond.

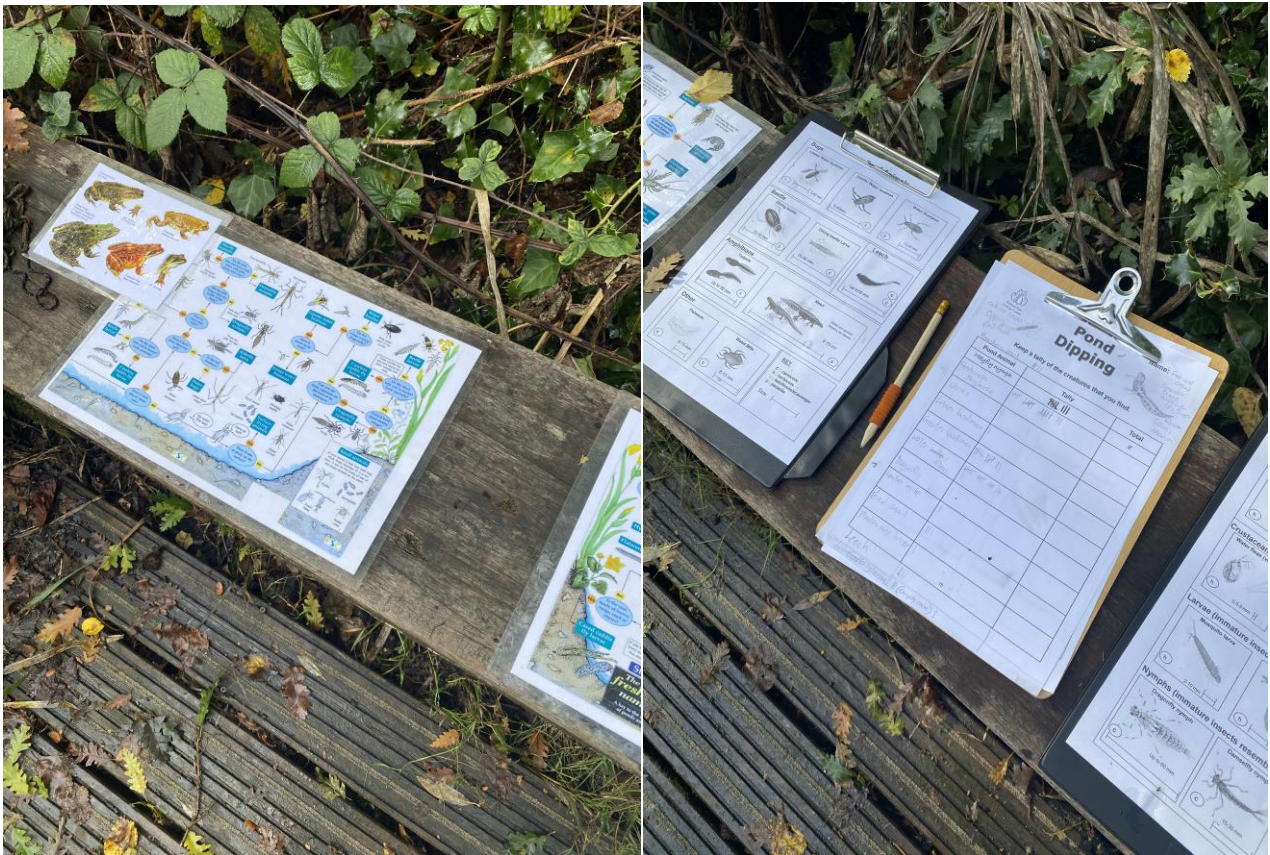
Currently, a weekly pond dipping study has been established at Dacres Wood, and it'll be conducted over a period of six months. There is a great interest to learn more about how healthy the pond at Dacres Wood is. The pond dipping started with the children of FWG in mid-October (autumn) and it'll continue up to early spring.



## *SAMPLING METHODS*

Sampling locations have been randomly selected around the pond, where the first six weeks of the survey were conducted on the dipping platform, and the following ones will be carried out on the pond bridge. Surveyors have been collecting aquatic invertebrates from shoreline areas of the pond, amongst plants, as well as from open water, ensuring that the habitat of the diverse wildlife at Dacres Wood would not be adversely affected.

Standard pond nets of size of side 86cm and mesh size 1mm have been used, pond-net samples have been placed directly into white trays containing water to allow identification and quantitative sampling. Field guides and keys have been used to identify invertebrates.



## *OBJECTIVES*

- The invertebrate survey will allow to determine how the pond life activity changes over a period of six months and how is the water quality of the pond.
- After completing a six-month pond dipping study, children at FWG will have learned a range of skills in identifying aquatic invertebrates that live in freshwater environments.
- After each survey, children at FWG will know basic freshwater surveying techniques, and will learn more about their local environment.

## WATER QUALITY ASSESSMENT

For the purposes of this study, benthic macroinvertebrates are being used as a tool for biomonitoring. Aquatic macroinvertebrates are generally localised so their response to any stress is related to local conditions. They also live for a period sufficient to identify impacts and display a wide range of sensitivity to water quality (Rose et al., 2016). These freshwater invertebrates are relatively easy to sample and identify; making its use well suited to public involvement studies (O’Leary et al., 2004) and especially with school aged children (Reynoldson et al., 1986).

In order to quickly assess the pond water quality, the OPAL Water Survey has been selected. This approach classifies aquatic invertebrates into 13 broad taxonomic classes, to each of which has allocated a ‘health score’ using a three-tiered system based on the invertebrate group’s tolerance to a broad range of stressors (Table 1) (Rose et al., 2016). Note: A classification of a pond to ‘quite healthy’ therefore required the presence of at least one medium-sensitivity (5 score) invertebrate class while a ‘very healthy’ classification required the presence of at least one high-sensitivity (10 score) class (Rose et al., 2016).

**Table 1.** *OPAL Water Survey invertebrate classification and ‘Invertebrate group health’ score based on the tolerance of the group to a range of stressors.*

<b>Tolerance class</b>	<b>Groups</b>	<b>Group health score</b>
<i>High sensitivity</i>	Cased caddisfly larvae; Caseless caddisfly larvae; Dragonfly larvae; Damselfly larvae; Alderfly larvae	<b>10</b>
<i>Medium sensitivity</i>	Mayfly larvae; Water beetles (adults and larvae); Water bugs (including water boatmen, water scorpions, water stick insects etc.); Pond skaters; Water shrimps	<b>5</b>
<i>Low sensitivity</i>	Water slaters (water hoglice); Worm-like animals (including chironomid larvae; flatworms; leeches; worms etc.); Water snails (spired; limpets; planorbids)	<b>1</b>
<b>Pond health score</b>	<b>OPAL Water Survey (2010) description</b>	
0–5	<b>Poor or ‘could be improved’</b>	
6–30	<b>Quite healthy</b>	
31 and above	<b>Very healthy</b>	



# LOCATION 1: DIPPING PLATFORM

DATE: 14/10/2020



## RESULTS:

Table 2. Invertebrate Survey 14/10

Pond Invertebrate	Abundance	Pond Health Score
Water fleas	Lightly populated	N/A
Freshwater hoglouse	18	1
Midge larvae	18	1
Flatworm	3	1
Greater boatman	10	5
Lesser boatman	4	5
Pond snail	3	1
Ramshorn snail	4	1
Mayfly nymph	1	5
Caddisfly nymph	0	0
		<b>20</b>

Pond Health Score Total = 20 = "Quite healthy"

\*Graph 1 in Annexes

DATE: 21/10/2020



Mayfly Nymph

Pond dipping tray  
w/macroinvertebrates

**RESULTS:**

**Table 3.** *Invertebrate Survey 21/10*

Pond Invertebrate	Abundance	Pond Health Score
Freshwater hoglouse	55	1
Midge larvae	104	1
Flatworm	5	1
Greater boatman	33	5
Lesser boatman	4	5
Diving beetle	14	5
Saucer bug	1	5
Water scorpion	3	5
Pond snail	4	1
Ramshorn snail	13	1
Freshwater shrimp	2	5
Mayfly nymph	3	5
		<b>40</b>

Pond Health Score Total = 40 = **“Quite healthy”**

Note: The pond health was classified as “quite healthy” as there isn’t any high-sensitivity invertebrate to classify it as “very healthy”.

\*Graph 2 in Annexes

**DATE: 04/11/2020**

**RESULTS:**

**Table 3. Invertebrate Survey 04/11**

<b>Pond Invertebrate</b>	<b>Abundance</b>	<b>Pond Health Score</b>
Freshwater hoglouse	9	1
Midge larvae	41	1
Flatworm	2	1
Greater boatman	35	5
Lesser boatman	4	5
Diving beetle	3	5
Pond snail	6	1
Ramshorn snail	4	1
Freshwater shrimp	3	5
Mayfly nymph	4	5
		<b>30</b>

Pond Health Score Total = 30 = "Quite healthy"

\*Graph 3 in Annexes

**DATE: 11/11/2020**

**RESULTS:**

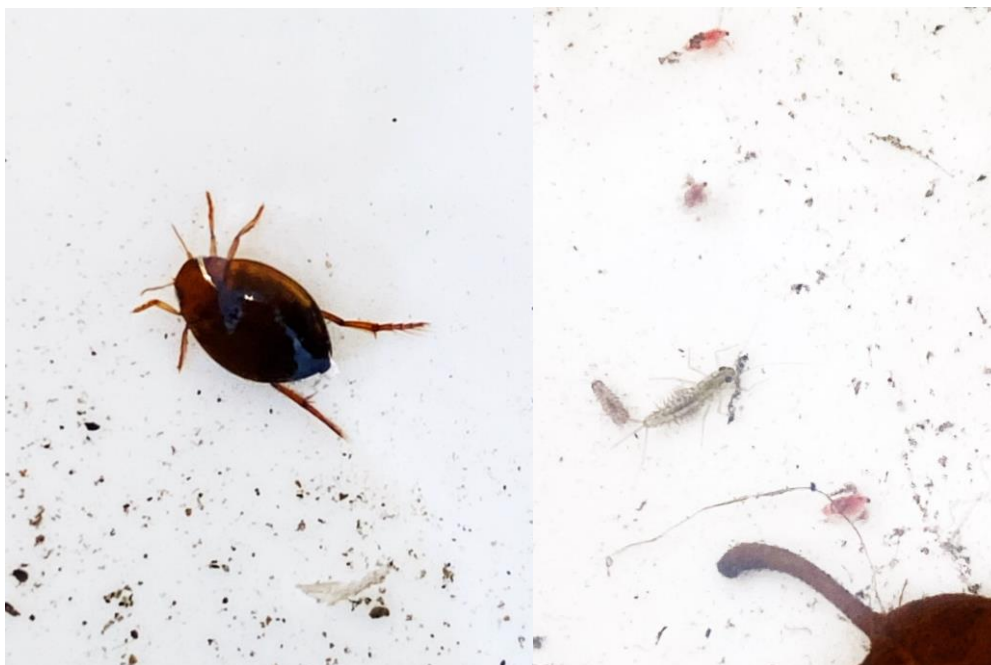
**Table 4. Invertebrate Survey 11/11**

<b>Pond Invertebrate</b>	<b>Abundance</b>	<b>Pond Health Score</b>
Freshwater hoglouse	54	1
Midge larvae	708	1
Flatworm	10	1
Greater boatman	15	5
Lesser boatman	0	0
Diving beetle	9	5
Pond snail	9	1
Ramshorn snail	22	1
Pond skater	1	5
Mayfly nymph	5	5
		<b>25</b>

Pond Health Score Total = 25 = "Quite healthy"

\*Graph 4 in Annexes

**DATE: 18/11/2020**



Diving beetle

Mayfly Nymph

**RESULTS:**

**Table 5. Invertebrate Survey 18/11**

<b>Pond Invertebrate</b>	<b>Abundance</b>	<b>Pond Health Score</b>
Freshwater hoglouse	68	1
Midge larvae	198	1
Flatworm	5	1
Diving beetle	5	5
Greater boatman	19	5
Lesser boatman	0	0
Pond snail	5	1
Ramshorn snail	26	1
Mayfly nymph	4	5
Caddisfly nymph	0	0
		<b>20</b>

Pond Health Score Total = 20 = "Quite healthy"

\*Graph 5 in Annexes



**DATE: 25/11/2020**



Dragonfly nymph



Dragonfly nymph, hoglouse, water fleas

**RESULTS:**

**Table 6. Invertebrate Survey 25/11**

<b>Pond Invertebrate</b>	<b>Abundance</b>	<b>Pond Health Score</b>
Freshwater hoglouse	50	1
Midge larvae	42	1
Flatworm	9	1
Diving beetle	2	5
Greater boatman	4	5
Lesser boatman	0	0
Pond snail	4	1
Ramshorn snail	10	1
Freshwater shrimp	3	5
Mayfly nymph	9	5
Dragonfly nymph	1	10
		<b>35</b>

Pond Health Score Total = 35 = **“Very healthy”**

\*Graph 6 in Annexes



# LOCATION 2: POND BRIDGE

DATE: 02/12/2020



Damselfly nymph



Phantom midge larvae

## RESULTS:

**Table 7.** *Invertebrate Survey 02/12*

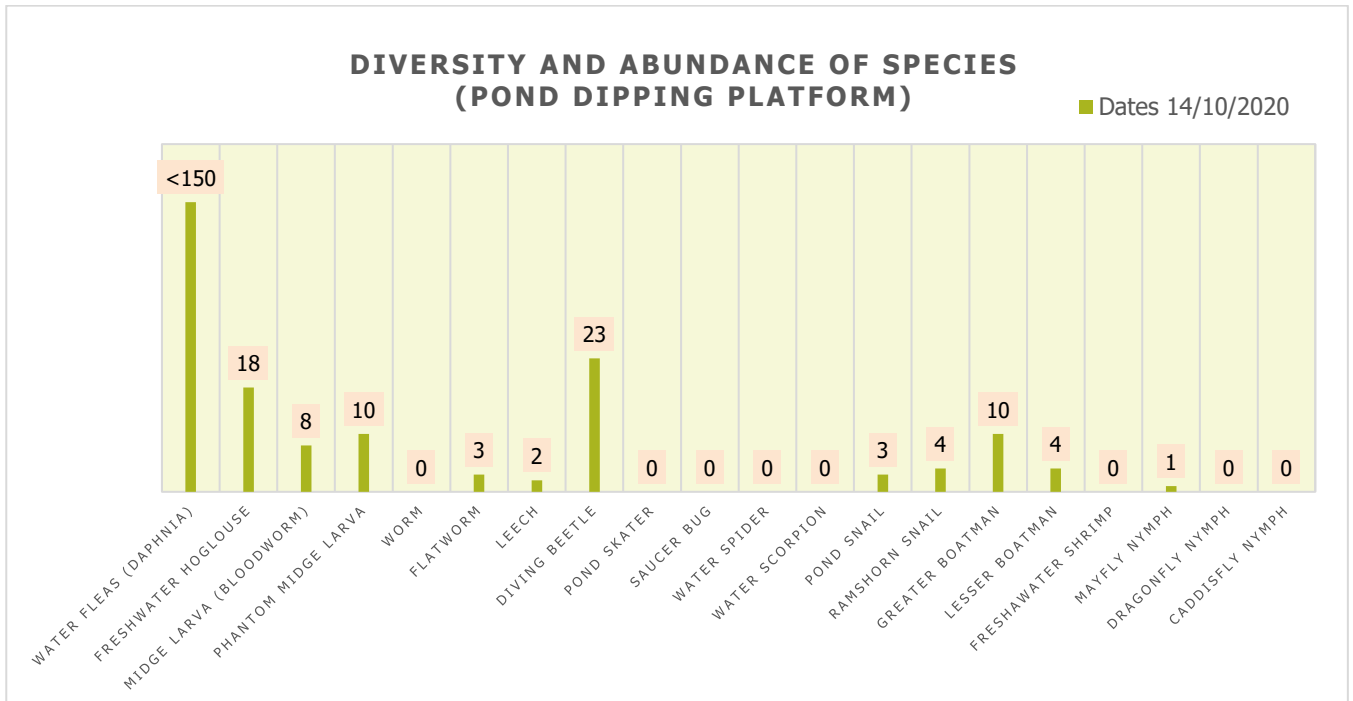
Pond Invertebrate	Abundance	Pond Health Score
Freshwater hoglouse	25	1
Midge larvae	23	1
Flatworm	26	1
Greater boatman	0	0
Lesser boatman	0	0
Pond snail	0	1
Ramshorn snail	5	1
Freshwater shrimp	0	0
Mayfly nymph	6	5
Damselfly nymph	1	10
		<b>20</b>

Pond Health Score Total = 20 = "Quite healthy" – with the presence of a high-sensitivity invertebrate.

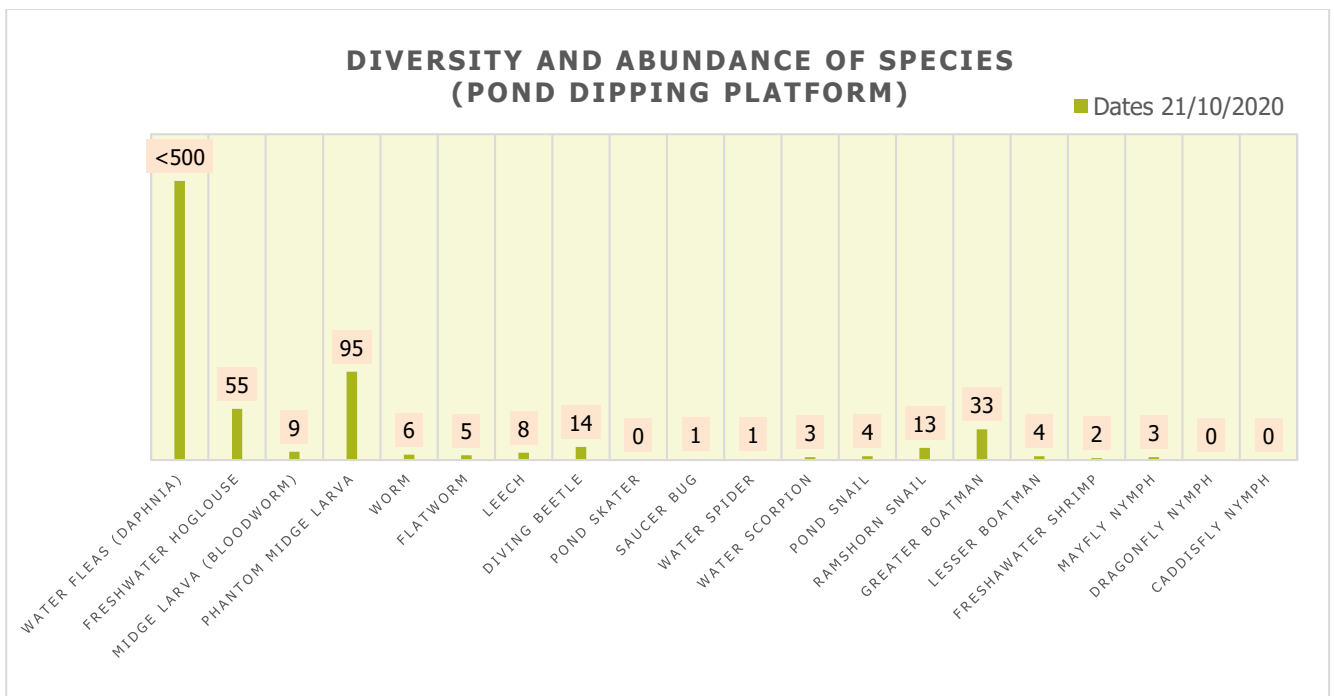
\*Graph 7 in Annexes

# ANNEXES

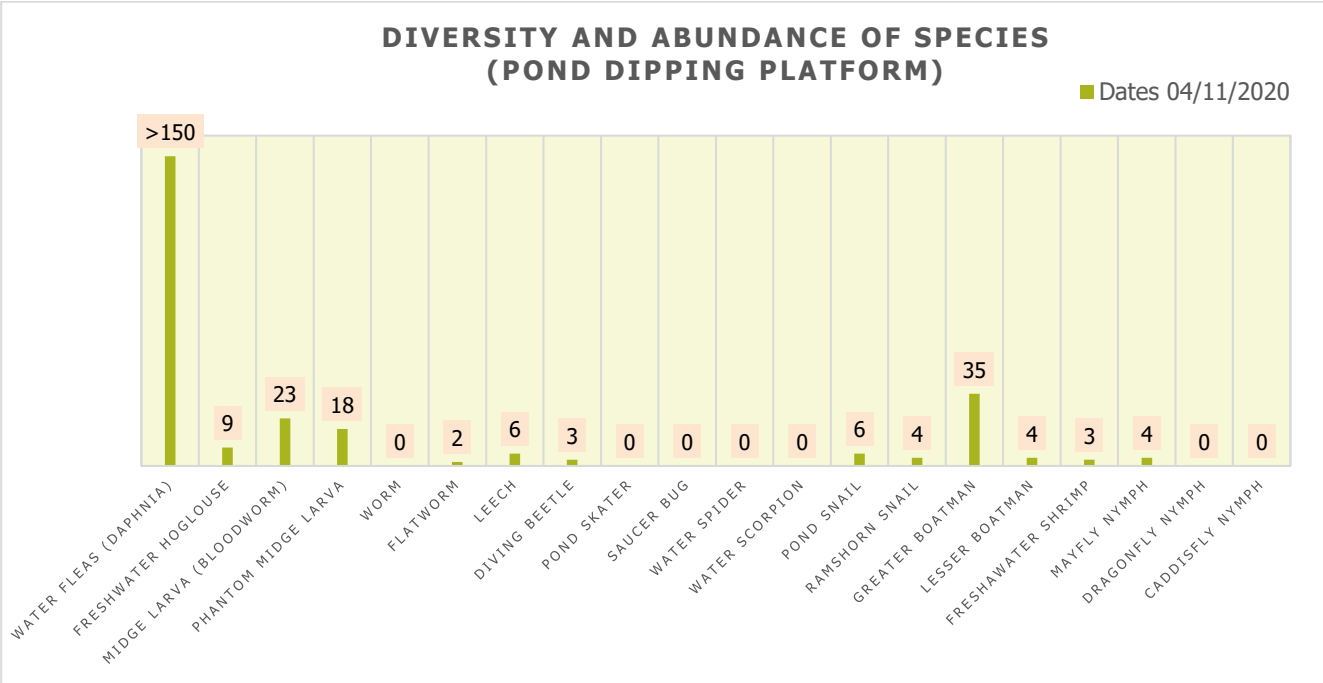
**Graph 1. Invertebrate Survey 14/10**



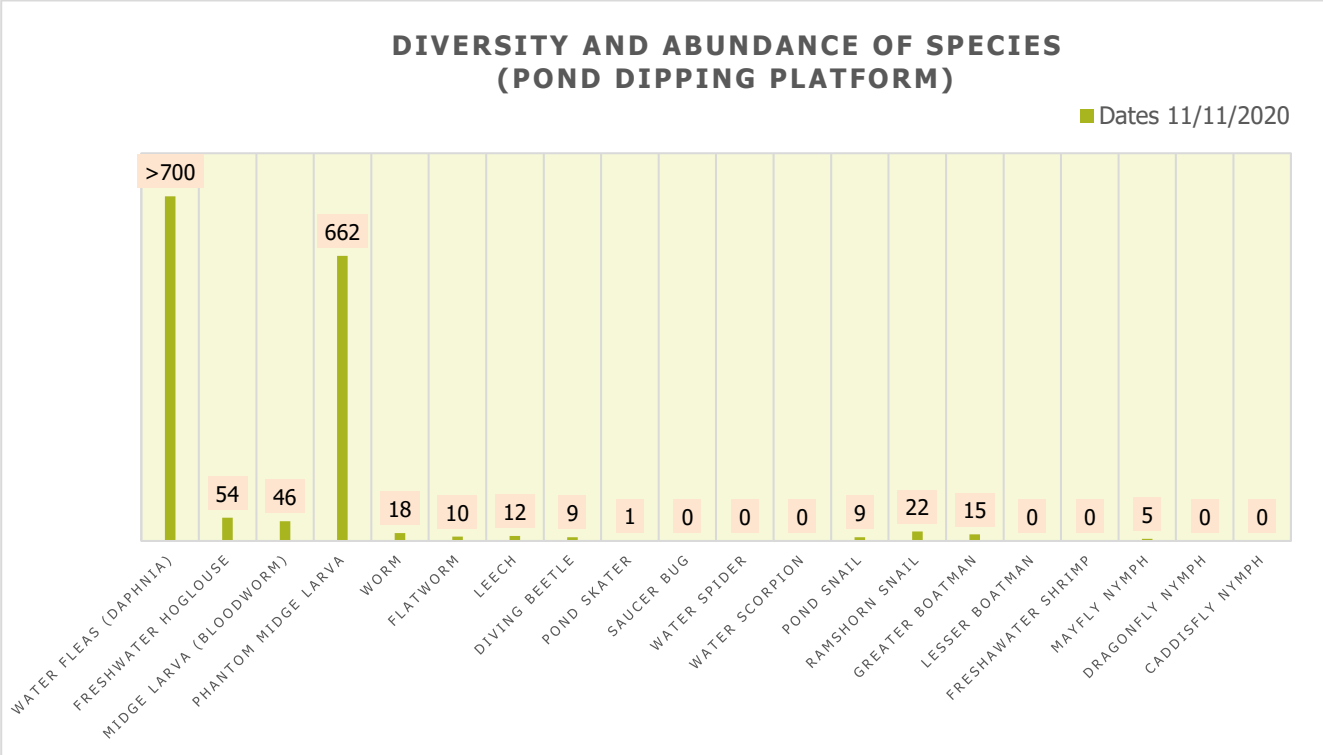
**Graph 2. Invertebrate Survey 21/10**



**Graph 3. Invertebrate Survey 04/11**

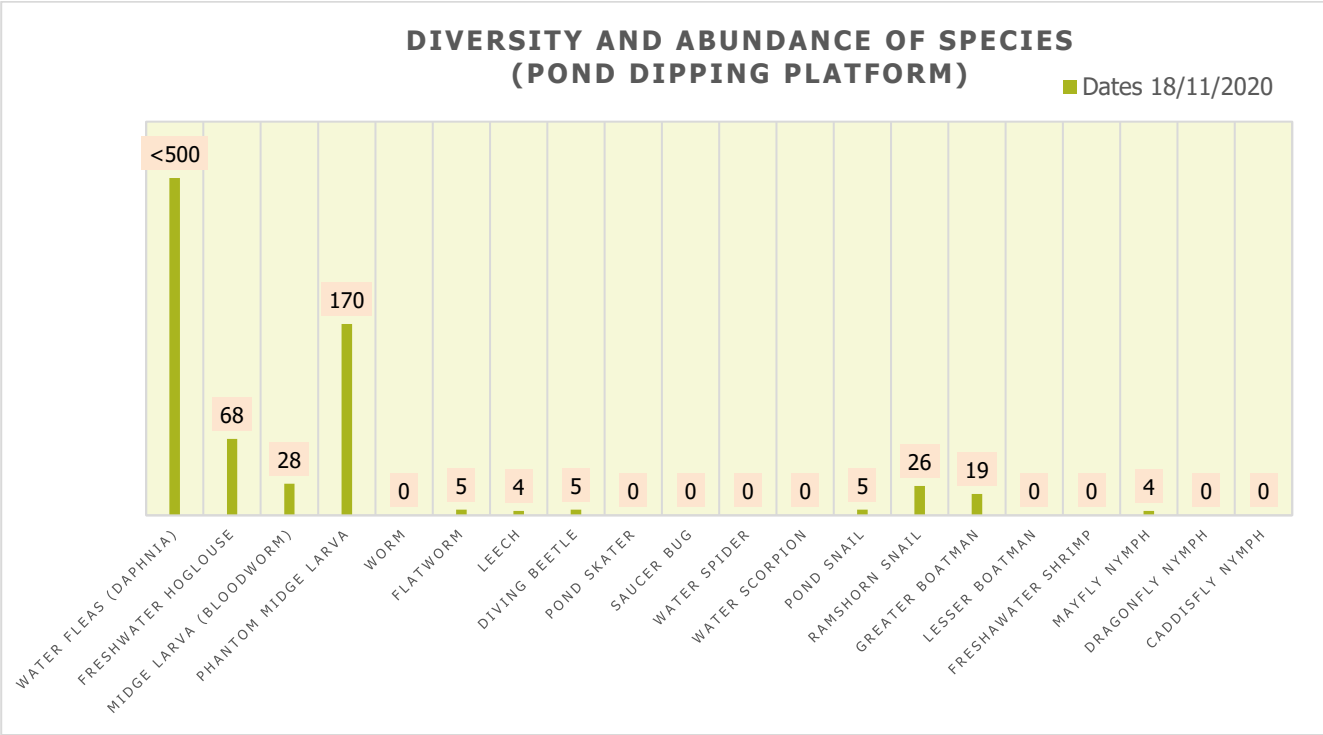


**Graph 4. Invertebrate Survey 11/11**

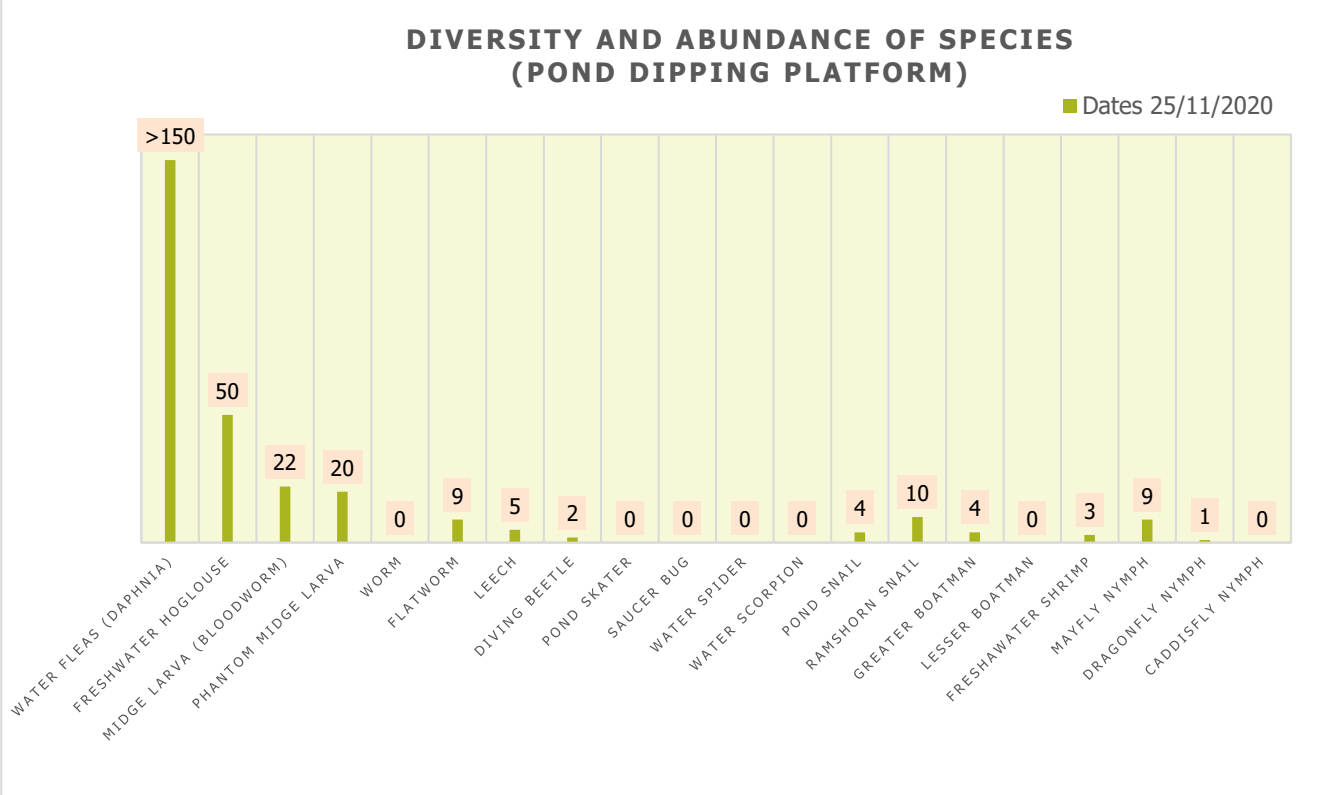




**Graph 5. Invertebrate Survey 18/11**



**Graph 6. Invertebrate Survey 25/11**



**Graph 7. Invertebrate Survey 02/12**

