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Our Ref: 000118.10

25 February 2021

Narre Warren Central Pty Ltd
Att Mr Paul Nio
52-54 Rathdowne Street
Carlton VIC 3053

Via email: pnio@osanrae.com.au
CC: cmistica@fidus.com.au; inga@natureadvisory.com.au

Dear Paul

Re: 2020 Annual Report of Water Quality and Dwarf Galaxias Monitoring for Casey Green

Aquatica Environmental was engaged by Narre Warren Central to undertake the 2020 annual monitoring of water quality and Dwarf Galaxias (*Galaxiella pusilla*) at the site of the Casey Green residential development at 96-166 Centre Road, Narre Warren, Victoria (the project).

The annual monitoring was undertaken to meet specific management actions outlined in the project's commonwealth, state and locally approved Dwarf Galaxias Management Plan (DGMP; BL&A 2015) and Dwarf Galaxias Salvage and Translocation Plan (DGSTP; Aquatica Environmental 2015). These actions were interpreted by the federal Department of Agriculture, Water and the Environmental (DAWE) to include the following monitoring requirements (DE 2016, including Aquatica Environmental 2015):

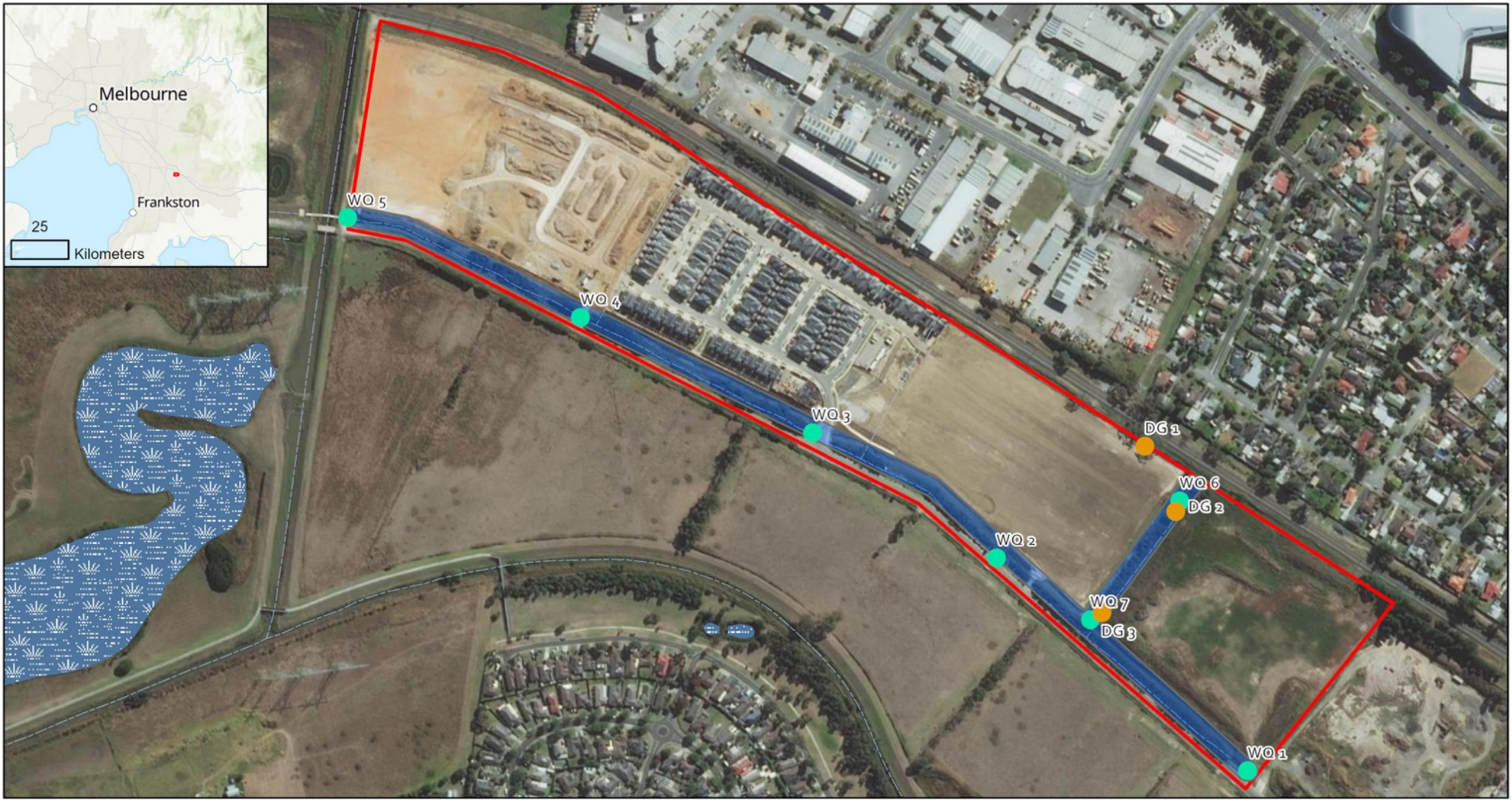
- **Dwarf Galaxias**: Survey Dwarf Galaxias and predatory fish populations at established/baseline and translocation release sites in November/December annually during construction and for least five years post completion of construction on the site.
- **Aquatic and riparian habitat condition**: Assess condition in conjunction with the Dwarf Galaxias survey.
- **Water quality**: Assess water quality at established sites once per fortnight and/or after rainfall events >10mm during construction, including during Dwarf Galaxias monitoring (Condition 3b and 3d).

This report has been produce to provide a summary record of the 2020 water quality and Dwarf Galaxias monitoring in accordance with the DGMP and DGSTP.

1 Methodologies

1.1 Sampling Sites

During initial baseline and salvage surveys in 2016-17 a number of water quality and Dwarf Galaxias survey sites were established (Aquatica Environmental 2017). However, in the time since these surveys were undertaken development of the site (and neighbouring sites) has progressed significantly and not all of the originally established site still exist. Figure 1 shows the sites that were monitored during the 2020 year. The only variation to the 2019 ,monitoring locations was the addition of an additional water quality sampling site at the main entrance to the development … (now referred to as Site WQ3)



0 50 100 200
Metres

Spatial Reference
Name: GDA2020 MGA Zone 55
PCS: GDA2020 MGA Zone 55
GCS: GDA2020
Datum: GDA2020
Projection: Transverse Mercator

N

Site
Wetland
Structure
Connector or drain
Retained Habitat

Monitoring Points
Water Quality Site (WQ)
Dwarf Galaxias Site (DG)

Casey Green, 96-166 Centre Road, Narre Warren

Dwarf Galaxias and Water Quality monitoring sites

Figure 1

AQUATICA ENVIRONMENTAL

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1.2 Dwarf Galaxias and Predatory Fish Monitoring

Dwarf Galaxias and predatory fish monitoring was undertaken at the three locations identified in Figure 1. These align with previous years monitoring, with Sites 2 and 3 corresponding to where Dwarf Galaxia were released during the 2016 salvage and translocation program (Aquatica Environmental 2017).

Sampling for adult Dwarf Galaxias and predatory was undertaken using hand-held dip-nets, sampling in and around areas of suitable habitat, and bait traps set overnight with phosphorescent baits. Sampling for larval Dwarf Galaxias was also undertaken by collecting a sample of water (approximately 10 litres) and placing it in a shallow white tray, where any larva would have been visible.

Active searching using dip-nets and bait-trapping are standard methods for sampling Dwarf Galaxias and are the most effective methods outlined in the Survey Guidelines for Australia's Threatened Fish (DSEWPaC 2004) and Biodiversity Precinct Structure Planning Kit (DSE 2010). They are also most appropriate method for sampling in the small and heavily vegetated water bodies, like those at the site.

Dwarf Galaxias sampling was undertaken by Aquatica Environmental at another nearby site, where Dwarf Galaxias also occur and as reference/baseline as to whether Dwarf Galaxias should have been detectable on the site.

1.3 Aquatic and Riparian Habitat Condition Monitoring

Aquatic and riparian habitat condition was visually and assessed at the Dwarf Galaxias survey sites. The assessment was primarily based on a comparison of the aquatic and riparian vegetation condition during this survey as compared to previous surveys (i.e. temporal comparison).

1.4 Water Quality Monitoring

Water quality monitoring was undertaken monthly between January and May, fortnightly and following rainfall events >10mm between late May and December and during the annual Dwarf Galaxias survey. In situ water quality data was collected by using a calibrated Hanna Instruments HI9829 multiparameter water quality metre. The parameters collected included temperate, electrical conductivity, pH, dissolved oxygen and turbidity.

2 Results

2.1 Sampling Frequency and Conditions

During the 2020 monitoring year a total of 22 sampling events had occurred in 2020, including 15 scheduled, 6 post >10mm rainfall and one during annual Dwarf Galaxias monitoring. The annual Dwarf Galaxias monitoring and associated water quality sampling occurred on the 9th and 10th of November. A single emergency site inspection was also undertaken on the 6th of August, however no water quality monitoring was undertaken at the time as it was deemed not necessarily following sampling the day prior.

A summary of the 2020 Dwarf Galaxias and water quality sampling schedule is provided in Table 1.

It should be noted that the 2020 monitoring year saw a change from what was initially understood to be a requirement for monthly water quality monitoring to fortnightly monitoring, as was stipulated in the DAWE approval (DE 2016). The change from monthly to fortnightly occurred in June.

Table 1 2020 Water quality sampling schedule

DAY	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	KEY
Wednesday	1/1/20			1/4/20			1/7/20						Standard WQ Monitoring Event
Thursday	2/1/20			2/4/20			2/7/20			1/10/20			Post >10mm rainfall event
Friday	3/1/20			3/4/20	1/5/20		3/7/20			2/10/20			**Incident**
Saturday	4/1/20	1/2/20		4/4/20	2/5/20		4/7/20	1/8/20		3/10/20			Next scheduled
Sunday	5/1/20	2/2/20	1/3/20	5/4/20	3/5/20		5/7/20	2/8/20		4/10/20	1/11/20		Annual DG Survey
Monday	6/1/20	3/2/20	2/3/20	6/4/20	4/5/20	1/6/20	6/7/20	3/8/20		5/10/20	2/11/20		
Tuesday	7/1/20	4/2/20	3/3/20	7/4/20	5/5/20	2/6/20	7/7/20	4/8/20	1/9/20	6/10/20	3/11/20	1/12/20	
Wednesday	8/1/20	5/2/20	4/3/20	8/4/20	6/5/20	3/6/20	8/7/20	5/8/20	2/9/20	7/10/20	4/11/20	2/12/20	
Thursday	9/1/20	6/2/20	5/3/20	9/4/20	7/5/20	4/6/20	9/7/20	6/8/20	3/9/20	8/10/20	5/11/20	3/12/20	
Friday	10/1/20	7/2/20	6/3/20	10/4/20	8/5/20	5/6/20	10/7/20	7/8/20	4/9/20	9/10/20	6/11/20	4/12/20	
Saturday	11/1/20	8/2/20	7/3/20	11/4/20	9/5/20	6/6/20	11/7/20	8/8/20	5/9/20	10/10/20	7/11/20	5/12/20	
Sunday	12/1/20	9/2/20	8/3/20	12/4/20	10/5/20	7/6/20	12/7/20	9/8/20	6/9/20	11/10/20	8/11/20	6/12/20	
Monday	13/1/20	10/2/20	9/3/20	13/4/20	11/5/20	8/6/20	13/7/20	10/8/20	7/9/20	12/10/20	9/11/20	7/12/20	
Tuesday	14/1/20	11/2/20	10/3/20	14/4/20	12/5/20	9/6/20	14/7/20	11/8/20	8/9/20	13/10/20	10/11/20	8/12/20	
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Thursday	16/1/20	13/2/20	12/3/20	16/4/20	14/5/20	11/6/20	16/7/20	13/8/20	10/9/20	15/10/20	12/11/20	10/12/20	
Friday	17/1/20	14/2/20	13/3/20	17/4/20	15/5/20	12/6/20	17/7/20	14/8/20	11/9/20	16/10/20	13/11/20	11/12/20	
Saturday	18/1/20	15/2/20	14/3/20	18/4/20	16/5/20	13/6/20	18/7/20	15/8/20	12/9/20	17/10/20	14/11/20	12/12/20	
Sunday	19/1/20	16/2/20	15/3/20	19/4/20	17/5/20	14/6/20	19/7/20	16/8/20	13/9/20	18/10/20	15/11/20	13/12/20	
Monday	20/1/20	17/2/20	16/3/20	20/4/20	18/5/20	15/6/20	20/7/20	17/8/20	14/9/20	19/10/20	16/11/20	14/12/20	
Tuesday	21/1/20	18/2/20	17/3/20	21/4/20	19/5/20	16/6/20	21/7/20	18/8/20	15/9/20	20/10/20	17/11/20	15/12/20	
Wednesday	22/1/20	19/2/20	18/3/20	22/4/20	20/5/20	17/6/20	22/7/20	19/8/20	16/9/20	21/10/20	18/11/20	16/12/20	
Thursday	23/1/20	20/2/20	19/3/20	23/4/20	21/5/20	18/6/20	23/7/20	20/8/20	17/9/20	22/10/20	19/11/20	17/12/20	
Friday	24/1/20	21/2/20	20/3/20	24/4/20	22/5/20	19/6/20	24/7/20	21/8/20	18/9/20	23/10/20	20/11/20	18/12/20	
Saturday	25/1/20	22/2/20	21/3/20	25/4/20	23/5/20	20/6/20	25/7/20	22/8/20	19/9/20	24/10/20	21/11/20	19/12/20	
Sunday	26/1/20	23/2/20	22/3/20	26/4/20	24/5/20	21/6/20	26/7/20	23/8/20	20/9/20	25/10/20	22/11/20	20/12/20	
Monday	27/1/20	24/2/20	23/3/20	27/4/20	25/5/20	22/6/20	27/7/20	24/8/20	21/9/20	26/10/20	23/11/20	21/12/20	
Tuesday	28/1/20	25/2/20	24/3/20	28/4/20	26/5/20	23/6/20	28/7/20	25/8/20	22/9/20	27/10/20	24/11/20	22/12/20	
Wednesday	29/1/20	26/2/20	25/3/20	29/4/20	27/5/20	24/6/20	29/7/20	26/8/20	23/9/20	28/10/20	25/11/20	23/12/20	
Thursday	30/1/20	27/2/20	26/3/20	30/4/20	28/5/20	25/6/20	30/7/20	27/8/20	24/9/20	29/10/20	26/11/20	24/12/20	
Friday	31/1/20	28/2/20	27/3/20		29/5/20	26/6/20	31/7/20	28/8/20	25/9/20	30/10/20	27/11/20	25/12/20	
Saturday		29/2/20	28/3/20		30/5/20	27/6/20		29/8/20	26/9/20	31/10/20	28/11/20	26/12/20	
Sunday		1/3/20	29/3/20		31/5/20	28/6/20		30/8/20	27/9/20		29/11/20	27/12/20	
Monday			30/3/20			29/6/20		31/8/20	28/9/20		30/11/20	28/12/20	
Tuesday			31/3/20			30/6/20			29/9/20			29/12/20	
Wednesday									30/9/20			30/12/20	
Thursday												31/12/20	

2.2 Dwarf Galaxias and Predatory Fish

The survey was undertaken on 9th to 10th November 2020 (approximately 5-6 weeks earlier than 2018 and 2 weeks earlier than 2019). The weather during the survey was mild to warm with temperatures ranging between 20°C (day time maximum) and 8.1°C (night time minimum). No rain fell during the survey The seasonal timing for the survey (late spring) was ideal and young of year and adults would be expected to be found following the usual late autumn to spring breeding season.

It's worth noting that larvae Dwarf Galaxias were also observed at Site WQ6 during water sampling on 28 September 2020, indicating breeding was/had occurred (Plate 1a).

A total of 25 Dwarf Galaxias were recorded during the November survey, including 20 young adults of year (i.e. from this most recent breeding season) and 5 previous year surviving adults (Plate 1b). All were recorded at Site DG2, with none at DG3 and DG1 which were too dry/low water to survey. All were recorded near Site DG2/WQ6 with Site DG1 being mostly dry/drying and unable to be sampled and limited access for sampling to Site DG3 (Due to dense vegetation).

Unlike the 2019 survey, no breeding adults were recorded during the early November survey, suggesting breeding had ended. This finding was further supported by a general lack of breeding adults at a nearby refence site and by juveniles being incidentally recorded while collecting water samples on 28 September 2020.

Based on the number and condition of the individuals recorded during this survey, it appears there has been another good year for the species on the site (i.e. 2019 and 2020). This has also been our experience at other sites in the region, mostly due to above average winter/spring rains and mild temperatures.

The results also confirm that the constructed swales are continuing to function well and as intended, by supplying consistent water levels to the retained habitat, but limiting pest fish ingress to the retained habitat drain.

The results of the November 2020 survey are provided in Table 2 and compared to previous rounds of monitoring.

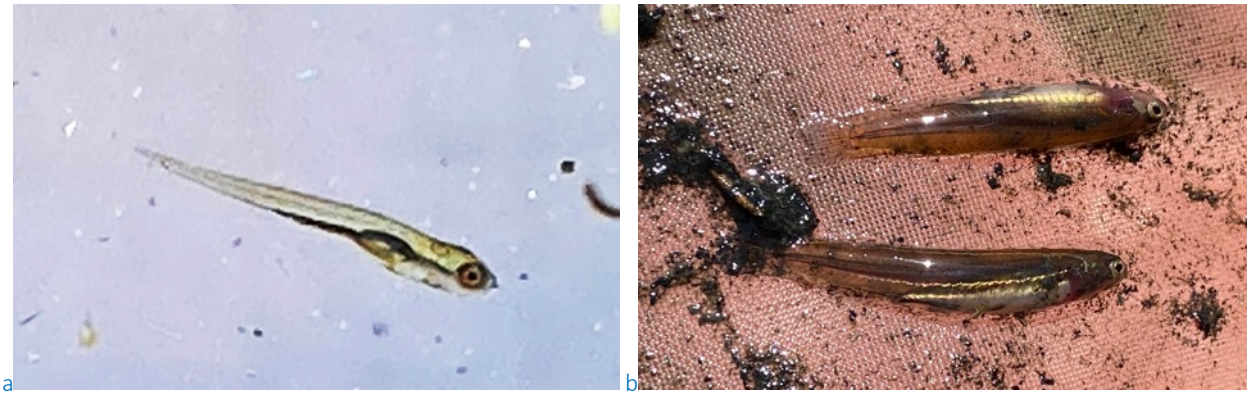
Similarly to the 2018 and 2019 surveys, Mosquitofish (*Gambusia holbrooki*) (Plate 2a) were recorded in small numbers in the retained habitat at Site DG2. This is very low abundance compared to the unvegetated reaches of the main Centre Road drain and new swales, where Mosquitofish are observed in the many thousands and large adult Goldfish

(and other pest species) are known to reside. It is likely the dense emergent vegetation and Melaleuca overstory, which is favoured by Dwarf Galaxias, it not preferential for the pest species.

A single Oriental Weatherloach (*Misgurnus anguillicaudatus*) was also recorded for the first time at Site DG2 (Plate 2b).

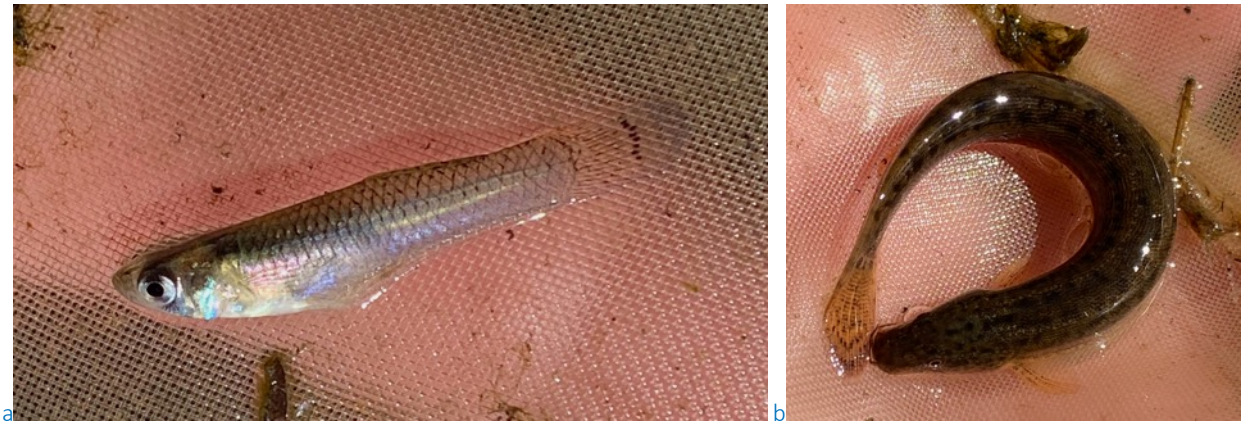
Table 2 Number of individuals recorded

Common Name	Scientific Name	Sampling Event			
		2020	2019	2018	2017
Dwarf Galaxias	*Galaxiella pusilla*	25	12	3	2
Mosquitofish	*Gambusia holbrooki*	12	6	3	-
Goldfish	*Carassius auratus*	-	2	4	-
Freshwater Burrowing Crayfish	*Engeus spp.*	-	1	1	-
Oriental Weatherloach	*Misgurnus anguillicaudatus*	1			



a b

Plate 1 Larval (a) and adult (b) Dwarf Galaxias



a b

Plate 2 Mosquitofish (a) and Oriental Weatherloach (b)

2.3 Aquatic and Riparian Habitat Condition

Aquatic and riparian habitat condition was assessed during the Dwarf Galaxias survey at sites DG1, 2 and 3.

Aquatic and riparian habitat at site DG 2 appeared to have further improved upon that observed during the 2019 survey. As previously reported the swales either side of this habitat maintain a relatively consistent water level yet still allowing some drying and filling on an ephemeral basis. This provides excellent conditions through the retained habitat for aquatic, emergent and overstory vegetation. Compared to the 2019 survey there appeared to be a continued increase in the area, density and abundance in particular of emergent vegetation such as Persicaria and Juncus, and further recruitment of Melaleuca (Plate 3a and b).

During the survey sites DG1 and DG3 had mostly dried, with negligible surface water present at the time. habitat conditions at these sites were similar to previous years of monitoring with some sparse patches of aquatic an emergent vegetation and an overstory of Melaleuca, In much the same condition as during previous years of monitoring.

a   b

Plate 3 Habitat edge vegetation at Site DG2 showing Melaleuca recruitment (a) and existing retained habitat (b)

2.4 Water Quality

The raw water quality data is provided in Appendix B. Table 1 provides a summary of the relevant statistical analysis and/or relevant State Environmental Protection Policy (Waters)(SEPP; EPA 2018) objectives for the Urban, Lowlands of Dandenong Creek segment.

Overall the data showed the following patterns:

- Temperature was on average very consist across the year, with the highest combined site average occurring during the 29th January sampling event (mean = 24.42°) and lowest in during the 17th July event (mean = 8.53°). Comparing sites, the lowest average temperatures were observed at those with more vegetation (i.e. shading at Sites 6 and 7) and highest at those with the least shading (i.e. Sites 1 and 5).
- pH was on average consistent across all sites and did not exceed the SEPP Waters objectives.
- Electrical conductivity was consistently and significantly higher at Sites 6 (mean=1346 µS/cm compared to 640-911 µS/cm at Sites 1-5 and 7), most likely reflective of the lack of direct flows and the concentration of salts due to evaporation. The SEPP Waters objective of ≤500 µS/cm was exceeded at all sites. However, the levels observed were not attributable to the development of the site, rather occurred naturally and/or other influences, and were clearly of no concern for Dwarf Galaxias due to their ongoing presence and increased abundance at the site.
- Percent dissolved oxygen was consistently low across all sites. The SEPP Waters objective of ≥75% was not met at any site. Similarly to electrical conductivity, the levels observed were not attributable to the development of the site, rather occurred naturally and/or other influences, and were clearly of no concern for the resident Dwarf Galaxias population.
- Turbidity was on average highest at Site 1, indicating a high turbidity input from unknown upstream sources and which was visually observed during sampling events on 5th August, 17th July and 25th May. The data showed that turbidity generally reduced through the downstream flowing sites (i.e. Site 1 to 5) with no strong indication of inputs from the development of the site. The SEPP Waters objective of ≤25 NTU was not met at any site. Again, the overall levels observed were not attributable to the development of the site, rather occurred naturally and/or other influences, and were clearly of no concern for the resident Dwarf Galaxias population.

Table 3 Water quality sampling summary

Parameter		SEPP (Waters) Objective	Centre Road Drain Sites					Habitat Sites	
			Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
Temperature (°C)	Min.	NA	8.24	8.36	8.49	8.55	8.53	7.22	8.23
	Max.		22.75	26.20	18.30	25.90	24.73	22.50	19.89
	Mean		14.60	14.09	14.32	14.41	14.87	14.03	13.14
pH	25th %tile	≥6.4	6.48	6.52	6.72	6.65	6.59	6.67	6.59
	75th %tile	≤7.9	7.05	6.91	7.06	7.12	7.17	7.02	6.99
	Mean	NA	6.77	6.75	6.94	6.84	6.82	6.88	6.74
Electrical Conductivity (µS/cm)	75th %	≤500	812	730	911	689	640	1346	852
	Mean	NA	640	610	803	554	518	988	727
Dissolved Oxygen (%)	25th %tile	≥75	28.93	24.00	32.60	30.73	42.83	45.00	31.65
	Max.	130	81.40	62.80	46.90	60.30	60.10	87.40	68.90
	Mean	NA	42.93	37.42	38.26	39.41	48.72	52.11	44.92
Turbidity (NTU)	75th %tile	≤25	101.5	90.2	49.9	83.5	83.3	55.7	72.5
	Mean	NA	113.2	61.4	36.2	64.4	53.1	41.4	60.5

3 Summary and Recommendations

The 2020 annual Dwarf Galaxias monitoring event detected 25 individual Dwarf Galaxias in the retained habitat drain (compared to 12 in 2019 and 3 in 2018). This was the highest never recovered at any stage of the program and indicates that conditions for the species have improved over recent years. The primary reason for this is the constructed swales retained water level in the retained habitat drain in a manner that is clearly suited to the resident Dwarf Galaxias population (i.e. Still maintaining ephemerality but not allowing over drying).

Considering this and previous rounds of sampling for the project and historical records (Aquatica Environmental 2017, 2019 and 2020), it is considered likely the abundance and distribution of the Dwarf Galaxias population in the habitat areas is somewhat dynamic, varying between years and due to seasonal influenced on water availability and therefore habitat. However, with the continued improvement of the retained habitat and expansion of suitable habitat into the constructed swales it is safe to say there has been an overall increase in the quality and area of available habitat for Dwarf Galaxias. This appears to have also correlated with a slight increase in the number of predatory fish species (i.e. Mosquitofish and Oriental Weatherloach), however their presence doesn't appear to have impacted the successful breeding and increasing numbers of Dwarf Galaxias. This is probably due to the habitat being more suitable to Dwarf Galaxias than the pest/predatory species.

Based on the results of the 2020 survey and the 2020 data, it is our option that development of the Casey Green site to date has been undertaken in accordance the DGSTP and associated approvals. No ecologically significant impacts have been observed to the retained habitat, with the constructed swales having improved overall conditions for Dwarf Galaxias.

The 2021 monitoring year commenced in January 2021. In accordant with approved DGSTP (and the project Dwarf Galaxias Management Plan; BL&A 2015) the following monitoring should occur during the year:

- Water quality monitoring: Fortnightly and/or after rainfall events > 10 millimetres until all construction is completed (i.e. all works on site completed) and then monthly following completion.
- Dwarf Galaxias monitoring: Annually in November/December for at least five years post construction.

Please note, we interoperate the “completion of construction” to be the point at all major works including site clean-up, landscaping, etc. Have been completed and there is not further risk to the Dwarf Galaxias and their habitat (i.e. all possible sources of sediment/contaminant runoff have been mitigated.

If you have any questions or would like to discuss this assessment, report or any other matter further, please do not hesitate to call me on 0413 935 497.

Kind Regards,

Aaron Jenkin
Director and Principal Ecologist
Aquatica Environmental

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4 References

Aquatica Environmental (2015). Dwarf Galaxias Salvage and Translocation Plan for 96-166 Centre Road, Narre Warren. Report prepared for Narre Warren Central Pty Ltd c/- The Fidus Group Pty Ltd, dated January.

Aquatica Environmental (2017). Dwarf Galaxias Salvage and Translocation Program for 96-166 Centre Road, Narre Warren. Draft report prepared for Narre Warren Central Pty Ltd c/- The Fidus Group Pty Ltd, dated 9 January.

Aquatica Environmental (2019). 2018 Annual Water Quality and Dwarf Galaxias Monitoring for 7-11 Fullard Road Narre Warren. Report prepared for Narre Warren Central Pty Ltd c/- The Fidus Group Pty Ltd, dated May.

Aquatica Environmental (2020). 2019 Annual Water Quality and Dwarf Galaxias Monitoring for 7-11 Fullard Road Narre Warren. Report prepared for Narre Warren Central Pty Ltd c/- The Fidus Group Pty Ltd, dated May.

BL&A (2015). Dwarf Galaxias Management Plan. report prepared by Brett Lane and Associates for Narre Warren Central Pty Ltd c/- The Fidus Group Pty Ltd, dated January.

DE (2016). EPBC Act Referral Decision and Approval for the residential development of 96-166 Centre Road Narre Warren (EPBC 20014-7380). Australian Government Department of the Environments, Canberra. Signed 5 February.

DSE (2010). Biodiversity Precinct Structure Planning Kit. Department of Sustainability and Environment (now Department of Environment, Land, Water and Planning), Melbourne.

DSEWPaC (2004). Survey guidelines for Australia's threatened fish. Guidelines for detecting fish listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999. Department of Sustainability, Environment, Water, Population and Community (now Department of the Environment), Canberra.

EPA (2018), State Environmental Protection Policy (Waters). Victorian Environmental Protection Authority.

Appendix a: Water Quality Results

Temperature (°C)

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
23/12/20	18.60	18.60	18.30	18.50	18.70	19.56	19.77
14/12/20	18.42	18.19	17.99	19.75	20.80	20.09	19.89
25/11/20	17.75	17.73	17.85	18.79	20.61	20.22	19.63
9/11/20	15.88	14.25	15.83	13.31	16.52	13.75	13.86
26/10/20	15.77	14.23		14.28	15.85	16.29	15.51
19/10/20	15.85	13.90		14.62	15.52	16.62	15.18
8/10/20	15.58	14.55		14.92	15.51	18.49	17.50
28/9/20	12.47	11.54		11.67	14.43	13.68	12.95
25/9/20	13.88	11.57		12.40	11.38	10.72	10.66
11/9/20	12.06	10.60		10.90	10.45	10.01	10.24
24/8/20	10.16	9.82		9.44	9.43	9.19	9.68
19/8/20	12.37	11.24		11.66	11.20	10.96	11.06
5/8/20	9.32	9.21		8.92	8.99	7.22	8.23
28/7/20	10.90	10.23		9.98	10.38	9.88	9.99
17/7/20	8.24	8.36	8.49	8.55	8.53	8.59	8.63
26/6/20	12.10	11.14	11.49	11.87	10.62	10.63	10.90
12/6/20	11.60	10.50	10.32	12.63	12.19	9.55	9.68
25/5/20	10.14	8.83		10.26	11.61	9.17	
14/4/20	18.60	19.60		18.50	18.70	17.30	
18/3/20	19.30	17.06		17.26	17.46	16.18	
24/2/20	19.40	22.70		22.80	23.60	18.10	
29/1/20	22.75	26.20		25.90	24.73	22.50	

pH

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
23/12/20	6.86	6.91	6.98	6.87	6.81	6.86	6.99
14/12/20	6.85	6.90	7.04	6.77	6.75	7.00	7.08
25/11/20	6.57	6.57	6.73	6.64	6.71	7.07	6.95
9/11/20	6.55	7.21	7.07	7.27	6.95	6.59	6.91
26/10/20	6.45	6.77		6.76	6.61	6.68	6.73
19/10/20	6.45	6.78		6.76	6.63	6.66	6.73
8/10/20	6.32	6.35		6.22	6.28	6.75	6.53
28/9/20	7.06	6.55		6.45	6.32	7.11	6.89
25/9/20	6.72	6.92		7.21	6.89	7.45	7.01
11/9/20	6.77	6.50		6.78	7.34	6.87	6.59
24/8/20	6.34	6.03		6.29	6.18	6.64	6.21
19/8/20	6.26	6.43		6.62	6.58	6.79	6.60
5/8/20	6.99	6.67		6.56	6.81	7.57	7.03
28/7/20	6.77	6.69		6.68	6.69	6.53	6.71
17/7/20	7.27	7.83	7.36	7.38	7.41	7.04	7.02
26/6/20	6.08	6.34	6.68	6.71	6.38	6.38	6.21
12/6/20	7.03	6.69	6.71	6.89	6.12	6.51	6.39
25/5/20	7.28	6.97		7.48	7.51	7.00	
14/4/20	7.12	6.64		7.23	7.33	7.03	

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
18/3/20	6.76	6.51		6.77	7.35	6.86	
24/2/20	7.09	6.85		7.01	7.19	6.96	
29/1/20	7.31	7.29		7.15	7.12	6.95	

Electrical Conductivity (µS/cm)

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
23/12/20	1002	956	902	812	723	644	685
14/12/20	986	963	899	796	629	726	713
25/11/20	398	399	325	320	281	695	526
9/11/20	1006	995	920	692	584	369	469
26/10/20	634	710		536	475	532	579
19/10/20	631	707		540	472	536	576
8/10/20	264	428		377	370	692	692
28/9/20	284	355		375	399	1646	1153
25/9/20	768	900		620	644	1830	975
11/9/20	483	450		370	344	821	526
24/8/20	499	620		580	541	1426	852
19/8/20	412	653		755	786	804	806
5/8/20	395	685		901	898	1105	965
28/7/20	986	854		680	668	925	823
17/7/20	637	737	1424	824	853	755	865
26/6/20	492	439	529	505	506	506	487
12/6/20	758	408	623	533	469	1869	669
25/5/20	1052	392		486	387	2802	
14/4/20	826	431		418	368	1639	
18/3/20	600	469		350	348	476	
24/2/20	526	456		361	336	481	
29/1/20	432	409		349	315	465	

Dissolved Oxygen (%)

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
23/12/20	21.1	23.5	35.5	40.2	55.9	58.7	28.6
14/12/20	19.4	21.3	28.6	26.3	52.9	19.6	19.2
25/11/20	22.0	21.5	37.5	38.2	45.9	48.7	38.6
9/11/20	17.4	19.0	29.7	26.1	50.3	24.2	31.5
26/10/20	48.3	38.1		44.9	43.8	55.6	50.0
19/10/20	48.0	38.7		34.5	54.2	55.2	50.8
8/10/20	79.8	57.1		44.0	56.8	87.4	68.9
28/9/20	60.6	46.1		45.0	52.4	77.5	59.0
25/9/20	28.2	30.8		52.6	40.6	52.6	49.5
11/9/20	58.4	47.7		52.1	60.1	69.4	51.6
24/8/20	61.1	61.0		54.5	57.0	47.9	51.3
19/8/20	55.3	38.2		39.0	48.4	56.6	58.7
5/8/20	81.4	57.4		50.1	42.5	66.2	51.3
28/7/20	34.9	23.2		22.8	55.2	56.8	51.2
17/7/20	39.2	55.4	46.8	32.3	36.5	36.3	
26/6/20	36.2	25.5	46.9	60.3	37.4	37.4	26.8

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
12/6/20	31.1	33.6	42.8	58.6	42.3	45.6	31.7
25/5/20	53.9	62.8		37.9	33.0	44.8	
14/4/20	36.4	38.5		21.1	46.7	48.0	
18/3/20	24.9	10.1		14.3	58.3	43.2	
24/2/20	38.6	26.0		30.2	51.4	50.7	
29/1/20	48.3	47.8		42.0	50.2	64.1	

Turbidity (NTU)

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
23/12/20	25.90	24.6	23.9	19.3	21.6	15.0	19.5
14/12/20	12.6	13.5	16.0	9.6	12.6	19.6	12.3
25/11/20	17.75	16.8	18.7	18.7	19.1	16.3	17.0
9/11/20	18.8	3.1	16.8	5.6	9.3	13.0	12.9
26/10/20	78.9	48.0		47.7	29.1	21.5	22.7
19/10/20	102.0	78.0		228.0	89.0	55.0	73.0
8/10/20	146.0	93.0		215.0	118.0	56.6	72.3
28/9/20	100.0	118.0		86.7	67.5	18.7	22.9
25/9/20	44.6	23.5		26.8	24.9	27.0	21.8
11/9/20	50.5	47.8		72.9	75.0	59.4	67.4
24/8/20	96.4	151.0		159.0	165.0	132.0	153.0
19/8/20	104.0	81.7		73.9	95.1	40.5	55.0
5/8/20	790.0	203.0		98.9	61.6	47.7	52.3
28/7/20	88.3	56.7		20.4	23.1	21.6	22.9
17/7/20	46.6	130.0	17.7	57.5	49.3	18.4	
26/6/20	94.1	107.0	84.5	127.0	95.7	95.7	77.5
12/6/20	253.0	69.0	75.9	66.0	85.9	55.9	265.0
25/5/20	301.0	21.6		25.4	75.3	26.8	
14/4/20	55.3	16.0		14.9	12.3	42.6	
18/3/20	13.1	5.9		4.7	6.3	59.7	
24/2/20	22.0	15.5		15.4	12.3	35.7	
29/1/20	28.9	27.1		24.0	20.6	32.1	