Dwarf galaxias targeted investigation - Wills Street, Warragul

View looking east across Hazel Creek on the Wills Street development property

John McGuckin
Streamline Research Pty. Ltd.

Report prepared for Advantage All Development Group

November 2022

EXECUTIVE SUMMARY

Advantage All Development Group commissioned Streamline Research to conduct a targeted survey for the dwarf galaxias (*Galaxiella pusilla*) on the proposed development site at Wills Street, Warragul. This report provides information related to this species which can accompany the Planning Permit Application for the development of the property.

The dwarf galaxias is a small native fish of national significance which is listed as vulnerable under the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act, 1999. In Victoria, the dwarf galaxias is considered an endangered threatened species under the Flora and Fauna Guarantee Act, 1988 (Department of Environment Land, Water and Planning, 2021).

Although the dwarf galaxias was not captured in this investigation, there is potential for the species to benefit from the Wills Street development.

In the Hazel Creek catchment the dwarf galaxias is currently only known to a minor tributary of Hazel Creek, on the property at 295 Warragul Lardner Road, Warragul South. Relatively large numbers of dwarf galaxias were found on the property as recently as December 2021 (Ecolink Consulting, 2022), yet the fish do not seem to have suitable habitat downstream in Hazel Creek. This limited distribution is mainly due to the past degradation of Hazel Creek and its surrounds with the urban development of Warragul.

The Wills Street development is planning to rehabilitate a section of Hazel Creek and to construct an off-stream wetland. The works are expected to provide aquatic habitat variability, something that is currently absent in the reach that crosses the property. The works are a positive move towards improving the ecological value of Hazel Creek in Warragul. Providing shading, aquatic native vegetation and permanent water could provide favourable habitat for dwarf galaxias establishment.

With the right characteristics the newly created habitats may allow for the future establishment of dwarf galaxias, extending the existing range of the species in the Hazel Creek catchment.

CONTENTS

1.0 INTRODUCTION

Advantage All Development Group commissioned Streamline Research to conduct a targeted survey for the dwarf galaxias (*Galaxiella pusilla*) on the proposed development site at Wills Street, Warragul. This report provides information related to this species which can accompany the Planning Permit Application for the development of the property.

The dwarf galaxias is a small native fish of national significance which is listed as vulnerable under the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act, 1999. In Victoria, the dwarf galaxias is considered an endangered threatened species under the Flora and Fauna Guarantee Act, 1988 (Department of Environment Land, Water and Planning, 2021).

By surveying the Wills Street development property it was hoped that a better understanding of the distribution of the dwarf galaxias could be added to the existing information that has been provided for two other nationally threatened species, the Giant Gippsland Earthworm (GGE) (*Megascolides australis*) and the Warragul Burrowing Crayfish (WBC) (*Engaeus sternalis*). The GGE and WBC have previously been surveyed on the Wills Street development property (Van Praagh, 2021).

2.0 BACKGROUND INFORMATION

2.1 Study area

The development property is located at 14-70 Wills Street and 110 King Street, Warragul. The northern side of the property is along Wills Street. The western boundary is on King Street. The Princes Highway is on the southern boundary (Figure 1).

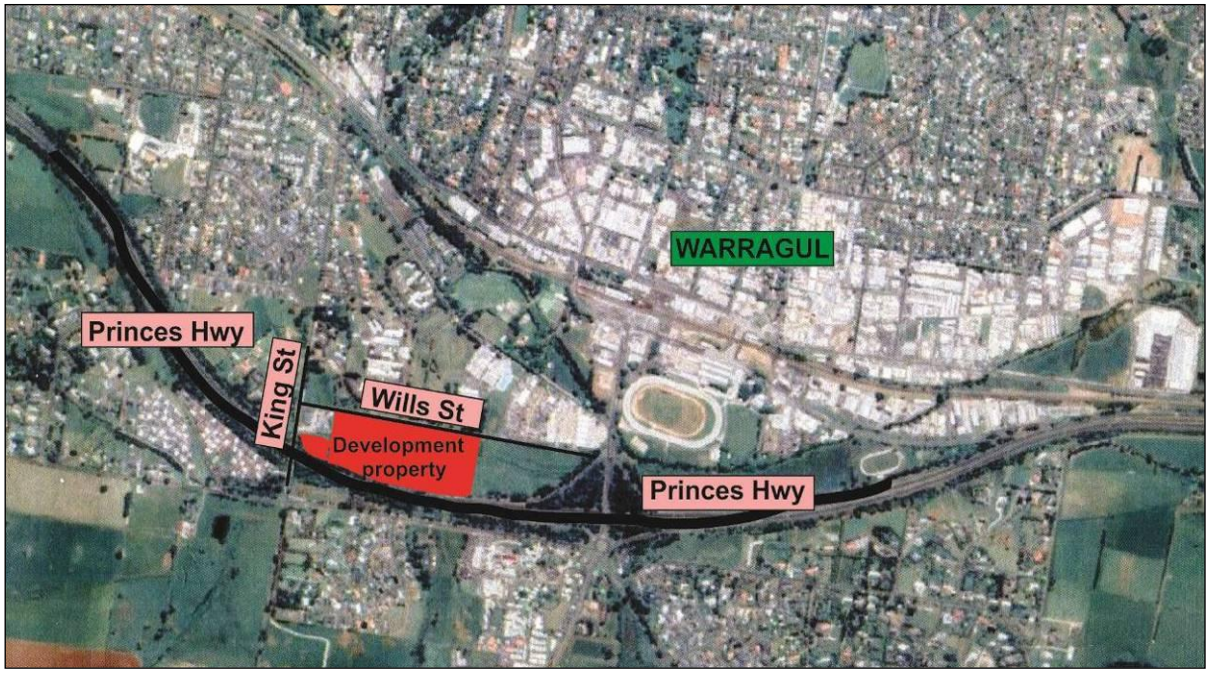

Figure 1. The location of the proposed Wills Street development.

Hazel Creek, a tributary of the Moe River passes through the middle of the Wills Street development property (Figure 2). The creek originates a couple of kilometres to the west and south of Warragul. Several headwater tributaries flow into a man-made wetland on the western side of King Street. From here water flows under the Princes Highway, across the Wills Street development property, past the Warragul showgrounds and the sewerage treatment plant, before draining into the Moe River about two kilometres to the east of Warragul.

The reach of Hazel Creek on the Wills Street development property has been seriously degraded by past instream works. Just prior to May 2020 extensive earthworks were conducted to remove willows (Kelly, 2022). These works have left the stream without riparian shading and with a homogenous channel with little aquatic habitat.

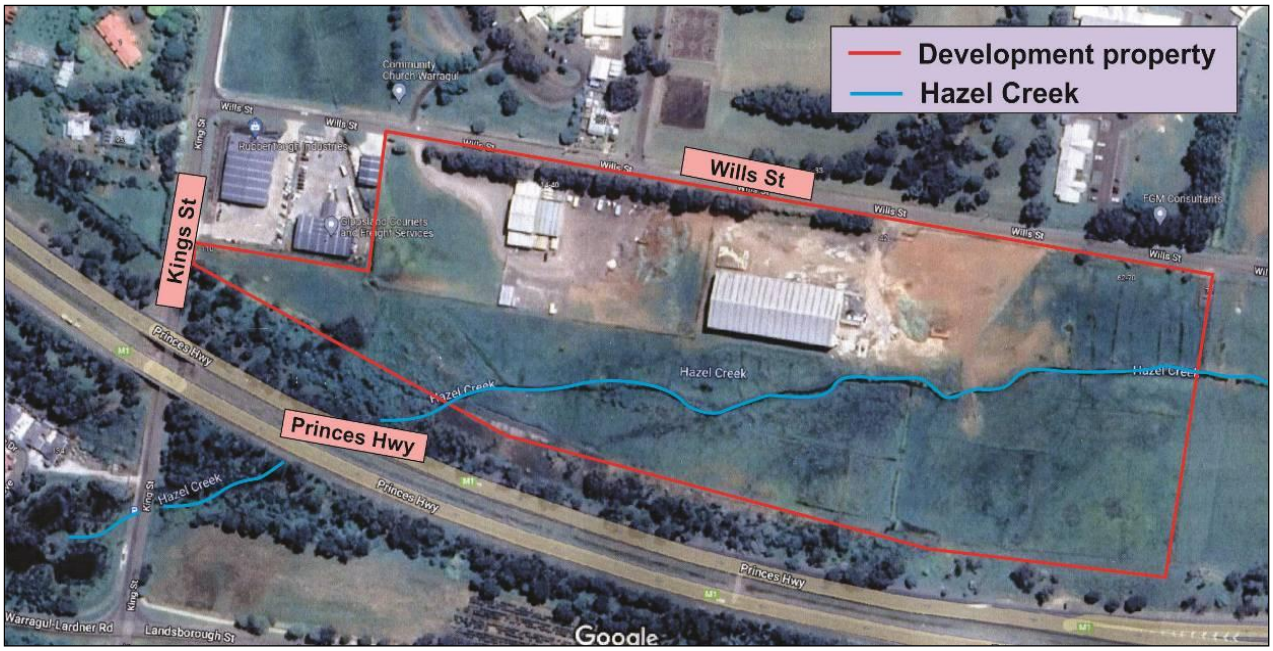

Figure 2. Wills Street development property and the existing alignment of Hazel Creek.

2.2. Aquatic fauna

The known fish fauna for Hazel Creek and surrounds includes four native fish species and five exotic fish species (Department of Environment Land, Water and Planning, 2022).

The native fish species are the short finned eel (*Anguilla australis*), the dwarf galaxias, the Flinders pygmy perch (*Nannoperca sp. 1*) and Australian smelt (*Retropinna semoni*).

The exotic species include goldfish (*Carassius auratus*), carp (*Cyprinus carpio*), eastern gambusia (*Gambusia holbrooki*), redfin (*Perca fluviatilis*) and brown trout (*Salmo trutta*).

For the targeted dwarf galaxias, the species has a natural range extending throughout south-eastern Australia, but the species has a fragmented distribution.

There is just one record for the dwarf galaxias for the Hazel Creek catchment on the Victorian Biodiversity Atlas. The 2011 record confirmed the presence of dwarf galaxias in a channel along Warragul Lardner Road, just 400 metres upstream from the Wills Street development property.

More recently, a targeted investigation on the property at 295 Warragul Lardner Road, Warragul South found dwarf galaxias in a headwater tributary (Ecolink Consulting, 2022). This tributary is expected to provide primary habitat for the dwarf galaxias, responsible for the long term survival of the species in the Hazel Creek catchment. Downstream movement of fish from this headwater location is likely to be attributed to the finding of dwarf galaxias at Warragul Lardner Road in 2011.

Dwarf galaxias have also been captured in the King Parrot Creek catchment (which is located just a few kilometres to the west of the Hazel Creek catchment), with the one known record from nearly 20 years ago (McGuckin, 2003).

Figure 3 (from Ecolink Consulting, 2022) shows the locations in which dwarf galaxias have been captured in the Hazel Creek catchment.

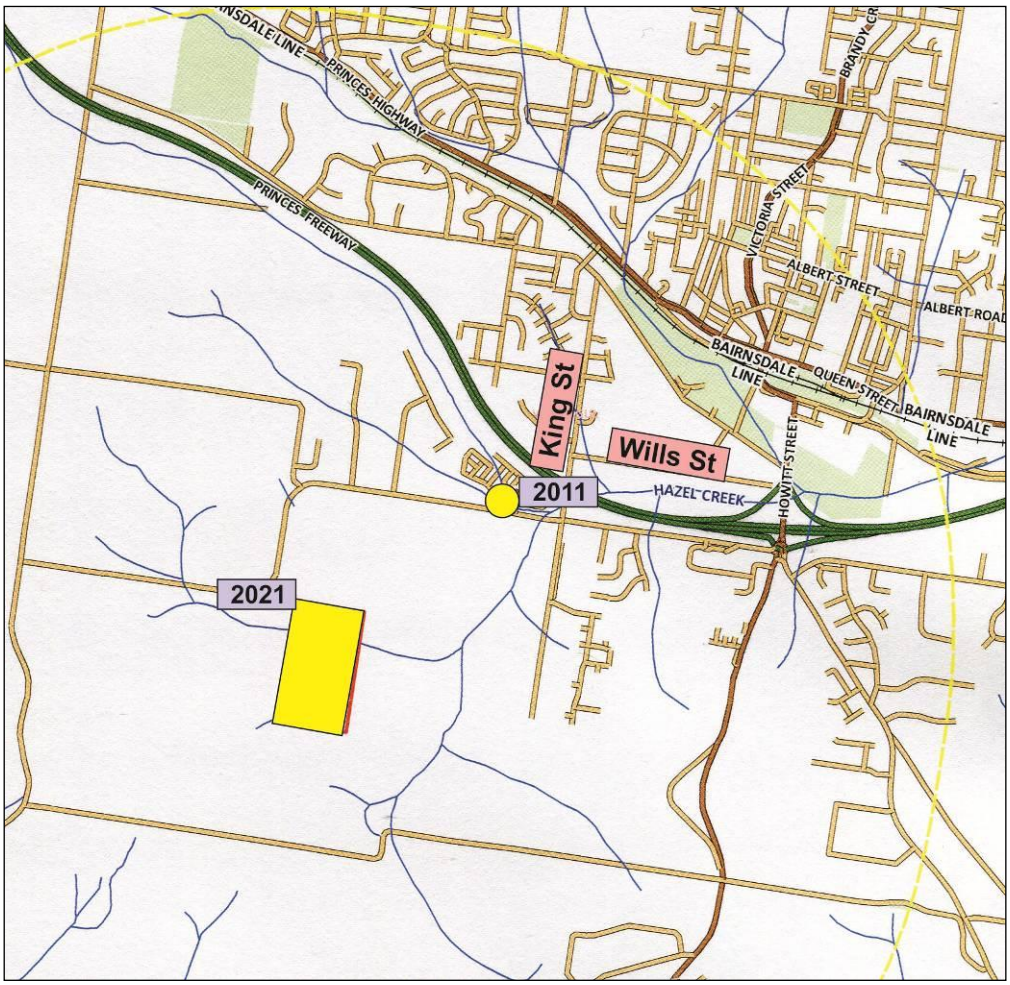

Figure 3. Locations where dwarf galaxias have been recorded in the Hazel Creek catchment, all of which are upstream of the Wills Street development property (base map from Ecolink Consulting, 2022).

3.0 FIELD SURVEY

A targeted field survey for the dwarf galaxias was made on the 17-18 October 2022. Locations surveyed included areas both upstream and downstream of the development property in the Hazel Creek catchment. The small tributary where the dwarf galaxias has recently been recorded (Ecolink Consulting, 2022) was not resurveyed in this investigation.

One location was surveyed on King Parrot Creek, to try and reconfirm the presence of dwarf galaxias in the creek. In total, 16 sites were surveyed, 15 on Hazel Creek (Figure 4) and one on King Parrot Creek. Appendix 1 shows representative photographs.

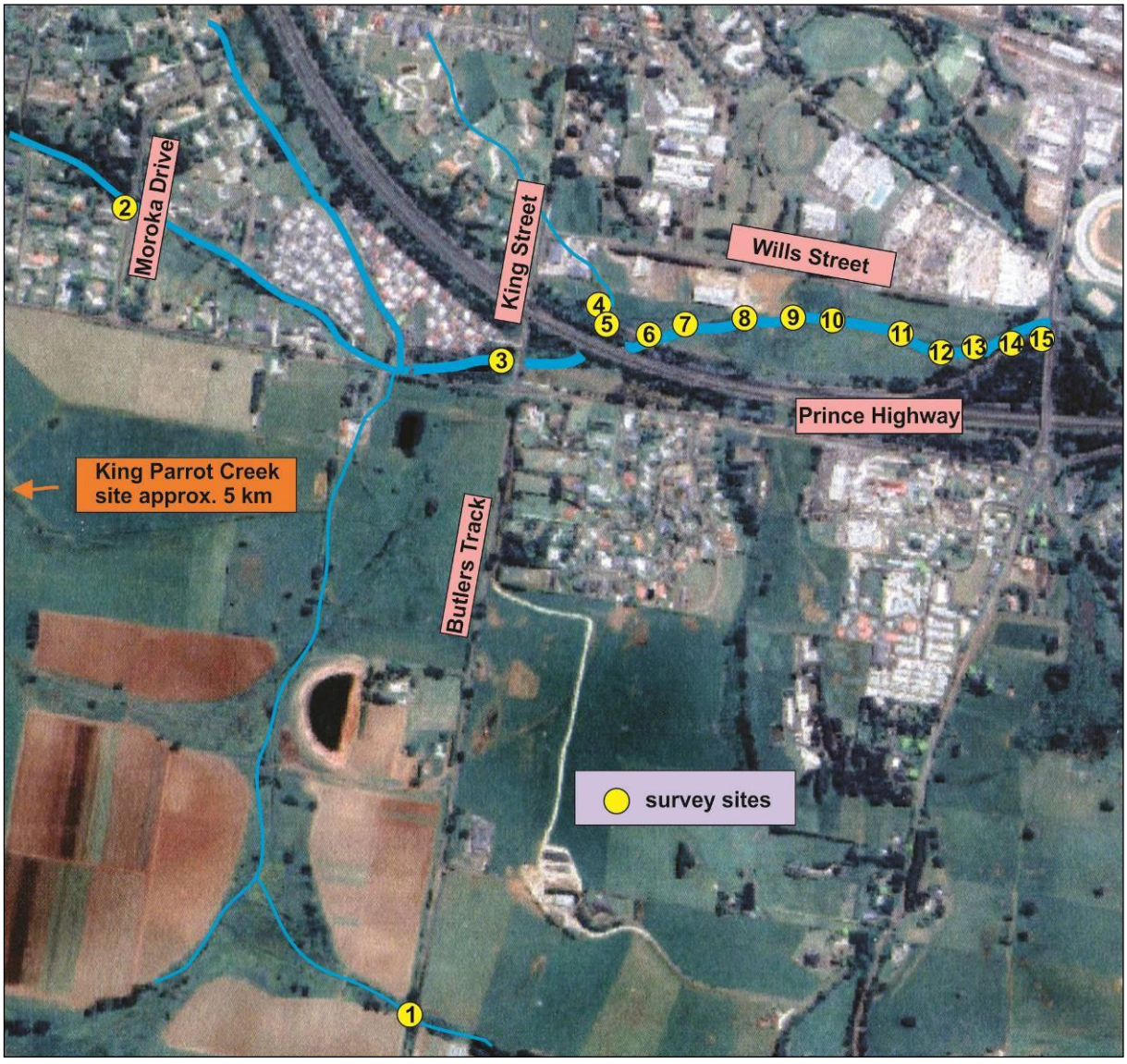

Figure 4. Fish survey sites.

Hazel Creek was surveyed at three sites upstream of the Wills Street development property. Two headwater tributaries were surveyed (sites 1 and 2) and a wetland downstream of their junction (site 3).

On the Wills Street development property seven locations were surveyed, one was on a minor tributary (site 4), the others within the Hazel Creek channel (sites 5-10). Additional Hazel Creek locations surveyed included three on the adjoining property (sites 10-13) and two along the Princes Freeway off ramp (sites 14 & 15).

Hazel Creek on the Wills Street development property and on the adjoining property is in very poor ecological condition. There is no native riparian vegetation and the channel itself appears to have been graded. There is little aquatic vegetation on the substrate. The channel is trapezoidal, with angled banks and a flat homogeneous bottom which is suspected to have been shaped when the willows were removed.

The one location surveyed on King Parrot Creek (site 16), was at the reserve at Garner and Holman Road, Drouin.

Dip netting and bait traps were employed for fish capture. Dip netting was undertaken at each site and then two bait traps were set overnight at all Hazel Creek locations downstream from King Street (sites 3-15).

Dip netting was the favoured fish capture technique as it is very effective for the capture of the dwarf galaxias and is a technique which minimises the need for handling fish, reducing impact on individual fish. Dip netting allows for dwarf galaxias to be viewed and returned unharmed at their point of capture. Other small resident fish species are also often captured when dip netting.

Under the expected Commonwealth dwarf galaxias survey guidelines the overnight setting of collapsible bait traps is one of the preferred survey methods for the species, particularly in areas of heavy cover or where conductivity is too high for electrofishing (Department of Sustainability, Environment, Water, Population and Communities, 2011).

4.0 FINDINGS

Table 1 shows the topographical map reference of each survey location and the capture of fish made at each.

The dwarf galaxias was not captured at any of the locations surveyed on Hazel Creek, and given the poor ecological condition of the waterway and surrounds is unlikely to be present anywhere downstream of King Street, Warragul.

Despite these findings, dwarf galaxias are expected to persist in one minor headwater tributary of Hazel Creek. The tributary, which passes through the property at 295 Warragul Lardner Road, Warragul South supports a population of dwarf galaxias, with 37 fish being captured as recently as December, 2021 (Ecolink Consulting, 2022). Further to this, the finding of dwarf galaxias in King Parrot Creek in this investigation, reconfirms another nearby waterway where dwarf galaxias also occur.

The two fish species captured in Hazel Creek in this study, gambusia and goldfish are both exotic species and have previously been found in the catchment. Both species were present in the reach of Hazel Creek on the Wills Street development property. Fish capture were few in number, further indicating the existing poor quality condition of instream habitat of Hazel Creek downstream of King Street.

Three adult goldfish (one coloured bright red) were also observed in the creek whilst setting bait traps. The only bycatch were a few shrimp at several locations and a Richards Burrowing Crayfish captured in a bait trap (site 12).

Table 1. Survey sites and fish capture.

Site Number	Location	Warragul 1:100000 8021 zone 55		Dip netting	Bait traps (x2)
		East	North		
1	Hazel Creek (Butlers Track)	405154	5773720	no fish	-
2	Hazel Creek (Moroka Drive)	404449	5775010	no fish	-
3	Hazel Creek wetland (King Street)	405314	5774697	15 eastern gambusia	3 eastern gambusia
4	Hazel Creek tributary (development site)	405473	5774828	5 eastern gambusia	9 eastern gambusia
5	Hazel Creek (development site)	405557	5774795	2 eastern gambusia 1 goldfish	4 eastern gambusia
6	Hazel Creek (development site)	405632	5774796	6 eastern gambusia 3 goldfish*	no fish
7	Hazel Creek (development site)	405702	5774781	no fish	no fish
8	Hazel Creek (development site)	405837	5774789	no fish	no fish
9	Hazel Creek (development site)	405979	5774809	6 eastern gambusia	2 eastern gambusia
10	Hazel Creek (adjoining property)	406001	5774808	3 eastern gambusia	8 eastern gambusia
11	Hazel Creek (adjoining property)	406145	5774763	1 eastern gambusia	no fish
12	Hazel Creek (adjoining property)	406242	5774752	no fish	1 Richards Burrowing Crayfish
13	Hazel Creek (adjoining property)	406309	5774750	1 eastern gambusia	2 eastern gambusia
14	Hazel Creek (Prince Hwy off take)	406356	5774781	no fish	no fish
15	Hazel Creek (Prince Hwy off take)	406404	5774781	no fish	no fish
16	King Parrot Creek (Gardner & Holman Rd)	396000	5777352	dwarf galaxias	-

*observation
- bait traps not set at this site

As part of the Wills Street development, Hazel Creek is to be realigned along the Princes Highway and a wetland is to be constructed (as depicted in Figure 5). These new habitats have the potential to provide improved habitat for the dwarf galaxias but also for GGE and WBC.

'*A drainage reserve will be established along the realigned Hazel Creek. This reserve is principally a meandering regular flow channel within the flood plain. The channel is proposed to contain several online ponds and riffles. The banks and riparian areas will provide opportunity for GGE and WBC habitat. The eastern section of the drainage reserve is proposed to provide a constructed wetland system to provide opportunistic habitat for Dwarf Galaxias*' (Kelly, 2022).

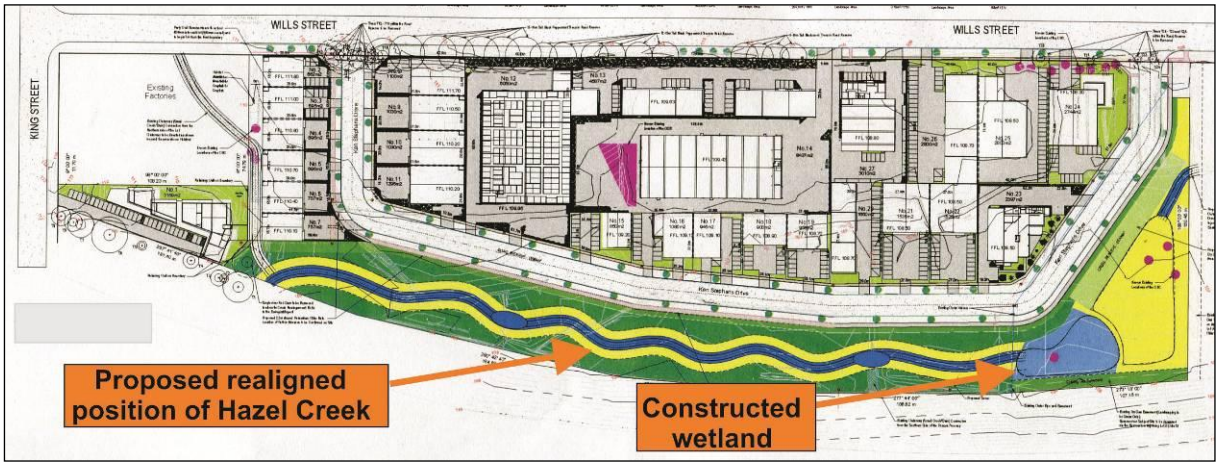

Figure 5. Future alignment of Hazel Creek and construction of wetland.

The West Gippsland Catchment Management Authority have reviewed the landscape and waterway management plans and have supported the proposed rezoning and subdivision of the Wills Street development property (a copy of the letter is included in Appendix 2). The Authority notes that a waterway offset arrangement has also been agreed upon, and this will include the translocation of WBC from several identified locations (Van Praagh, 2021) to the realigned reach of Hazel Creek and the wetland habitat.

5.0 CONCLUSION

Although the dwarf galaxias was not captured in this investigation, there is potential for the species to benefit from the Wills Street development.

In the Hazel Creek catchment the dwarf galaxias is currently only known to a minor tributary of Hazel Creek, on the property at 295 Warragul Lardner Road, Warragul South. Relatively large numbers of dwarf galaxias were found on the property as recently as December 2021 (Ecolink Consulting, 2022), yet the fish do not seem to have suitable habitat downstream in Hazel Creek. This limited distribution is mainly due to the past degradation of Hazel Creek and its surrounds with the urban development of Warragul.

The Wills Street development is planning to rehabilitate a section of Hazel Creek and to construct an off-stream wetland. The works are expected to provide aquatic habitat variability, something that is currently absent in the reach that crosses the property. The works are a positive move towards improving the ecological value of Hazel Creek in Warragul. Providing shading, aquatic native vegetation and permanent water could provide favourable habitat for dwarf galaxias establishment.

With the right characteristics the newly created habitats may allow for the future establishment of dwarf galaxias, extending the existing range of the species in the Hazel Creek catchment.

6.0 ACKNOWLEDGEMENT

Streamline Research is very appreciative to Gemma Phillips from Baw Baw Shire Council for providing the valued information on a past record of dwarf galaxias in the Hazel Creek catchment and for the link to the development of the property at 295 Warragul Lardner Road, Warragul South. Knowing a headwater population of dwarf galaxias exists allows for the potential range expansion of the species with the construction of favourable wetland habitat at part of the Wills Street development.

7.0 BIBLIOGRAPHY

Department of Environment Land, Water and Planning (2022). Victorian Biodiversity Atlas.

Department of Environment Land, Water and Planning (2021). Flora and Fauna Guarantee Act 1988 – Threatened List.

Department of Sustainability, Environment, Water, Population and Communities (2011). Survey guidelines for Australia's threatened fish. Australian Government.

Ecolink Consulting (2022). Targeted Dwarf Galaxias and Growling Grass Frog Surveys, 295 Warragul-Lardner Road, Warragul South.

Kelly P. (2022). Ecological (Flora & Fauna) Assessment (revised) 14-70 Wills St & 110 King St, Warragul. Prepared by PKA for Freeway Business Park P/L.

McGuckin, J (2003). Longwarry STP aquatic study. Prepared by Streamline Research for Parsons Brinckerhoff.

Van Praagh B. (2021). Giant Gippsland Earthworm and Warragul Burrowing Crayfish assessment at a proposed Industrial development – including four parcels of land Corner of Kings St and Wills St, Warragul. Prepared by Invert-Eco for Glenn Kell Planning Central.

APPENDIX 1. SITE PHOTOGRAPHS

HAZEL CREEK

Hazel Creek wetland (site 3).

Hazel Creek tributary (site 4).

Hazel Creek (site 5).

Hazel Creek (site 6).

Hazel Creek (site 7).

Hazel Creek (site 8).

Hazel Creek (site 9).

Hazel Creek (site 10).

Hazel Creek (site 11).

Hazel Creek (site 12).

Hazel Creek (site 13).

Hazel Creek along Princes Highway off take (site 14).

Hazel Creek along Princes Highway off take (site 15).

KING PARROT CREEK

King Parrot Creek at Gardner and Holman Road, Drouin (site 16).

APPENDIX 2. WEST GIPPSLAND CMA support letter

West Gippsland
Catchment Management Authority

WGCMA Ref: WGCMA-F-2020-00137
Document No: 3
Date: 09 November 2021

OFFICIAL

trevor@madcatconstructions.com.au

Trevor Reynolds
Mad Cat Constructions (Vic) Pty Ltd

Dear Trevor,

Application Number (CMA Ref): WGCMA-F-2020-00137

Property: **Street:** 14-70 Wills Street Warragul 3820
Cadastral: Lot 1 TP939243, Parish of Baw Baw

Thank you for your enquiry, received at the West Gippsland Catchment Management Authority ('the Authority') on 19 October 2021 in relation to request for letter of support for landscape and waterway management plans.

The Authority have reviewed the Site Landscaping Plan by Advantage All dated 06/10/2021 and Waterway Management Plan by Habitat Creations dated 07/10/2021 and is satisfied that these plans meet the requirements of the Authority. Based on these plans the Authority is willing to support the proposed rezoning and subdivision of the property.

The Authority notes that a waterway offset arrangement has also been agreed as part of the Authority's support for the rezoning of the Urban Flood Zone land to Industrial Zone..

Should you have any queries, please do not hesitate to contact Rhain Bateman on 1300 094 262 or email planning@wgcma.vic.gov.au. To assist the Authority in handling any enquiries please quote **WGCMA-F-2020-00137** in your correspondence with us.

Yours sincerely,

Adam Dunn
Executive Manager - Statutory Planning

The information contained in this correspondence is subject to the disclaimers and definitions attached.

ABN 88 062 514 481
Correspondence PO Box 1374, Traralgon VIC 3844
Telephone 1300 094 262 | **Facsimile** (03) 5175 7899 | **Email** westgippy@wgcma.vic.gov.au | **Website** www.wgcma.vic.gov.au
Traralgon Office 16 Hotham Street, Traralgon VIC 3844 | **Leongatha Office** Corner Young & Bair Streets, Leongatha VIC 3953

Definitions and Disclaimers

1. The area referred to in this letter as the 'proposed development location' is the land parcel(s) that, according to the Authority's assessment, most closely represent(s) the location identified by the applicant. The identification of the 'proposed development location' on the Authority's GIS has been done in good faith and in accordance with the information given to the Authority by the applicant(s) and/or the local government authority.

2. While every endeavour has been made by the Authority to identify the proposed development location on its GIS using VicMap Parcel and Address data, the Authority accepts no responsibility for or makes no warranty with regard to the accuracy or naming of this proposed development location according to its official land title description.

3. **AEP** as Annual Exceedance Probability – is the likelihood of occurrence of a flood of given size or larger occurring in any one year. AEP is expressed as a percentage (%) risk and may be expressed as the reciprocal of ARI (Average Recurrence Interval).

   Please note that the 1% probability flood is not the probable maximum flood (PMF). There is always a possibility that a flood larger in height and extent than the 1% probability flood may occur in the future.

4. **AHD** as Australian Height Datum - is the adopted national height datum that generally relates to height above mean sea level. Elevation is in metres.

5. **ARI** as Average Recurrence Interval - is the likelihood of occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100 year ARI flood will occur on average once every 100 years.

6. No warranty is made as to the accuracy or liability of any studies, estimates, calculations, opinions, conclusions, recommendations (which may change without notice) or other information contained in this letter and, to the maximum extent permitted by law, the Authority disclaims all liability and responsibility for any direct or indirect loss or damage which may be suffered by any recipient or other person through relying on anything contained in or omitted from this letter.

7. This letter has been prepared for the sole use by the party to whom it is addressed and no responsibility is accepted by the Authority with regard to any third party use of the whole or of any part of its contents. Neither the whole nor any part of this letter or any reference thereto may be included in any document, circular or statement without the Authority's written approval of the form and context in which it would appear.

8. The flood information provided represents the best estimates based on currently available information. This information is subject to change as new information becomes available and as further studies are carried out.

Page 2 of 2