2020-2024

MERI eDNA Program Report

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Client name: Melbourne Water

EnviroDNA

Melbourne Water

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Executive Summary

The Healthy Waterways Strategy 2018-28 forms the basis of Melbourne Water's long-term vision for managing rivers, wetlands, and estuaries across its 69 subcatchments. Monitoring 'key values'—platypuses, native fish, birds, frogs, macroinvertebrates, and vegetation—is a fundamental component of the Monitoring, Evaluation, Reporting and Improvement (MERI) framework of the Healthy Waterways Strategy. The current report presents initial results of the first broad-scale biodiversity monitoring program utilising environmental DNA (eDNA) in support of the MERI framework. The design of this program was consistent with the sampling design outlined in the Monitoring and Evaluation Plan under the MERI Framework, and was guided by a previous report that used quantitative methods to inform sampling design considerations (Tingley, Wu & Weeks, 2020).

Water samples (n=4,277) were filtered from 1,925 spatially-distinct sites across rivers, wetlands, and estuaries in each of Melbourne Water's 69 subcatchments during five sampling seasons (Spring 2021, Autumn 2022, Spring 2022, Autumn 2023, Spring 2023). Filtered samples from all three ecosystem types were subjected to an eDNA assay targeting vertebrates using amplicon metabarcoding, whereas wetland samples were also processed using an amphibian-specific metabarcoding assay. Quantitative PCR (qPCR) and a species-specific primer and probe were also used to detect Platypus eDNA and verify detections for other key taxa detected with metabarcoding.

The MERI eDNA program resulted in 54,821 detections of 355 aquatic and terrestrial taxa. Fifteen aquatic species were non-native, whereas 10 were considered threatened under the Federal Environment Protection and Biodiversity Conservation Act 1999 or the Victorian Flora and Fauna Guarantee Act 1988.

Nearly all detected species were detected in one or more subcatchments for which there was no record in Melbourne Water's catch database post-2010 (98.7% of fish species; 100% of frogs). Notable range extensions documented by the program include new detections of threatened species such as the Pale mangrove goby, Australian mudfish, and Australian grayling. Range extensions were also observed for species that are threatened yet more widespread, such as the Platypus. Indeed, historical Platypus records (post-2010) were absent from 13 subcatchments in which Platypus eDNA was detected via qPCR. Overall, Platypus eDNA was detected in 799 samples collected from 514 spatially-unique sites.

The results of this report demonstrate the immense power of broad-scale biodiversity monitoring via eDNA sampling for informing the MERI program. The current program achieved unprecedented spatial, temporal, and taxonomic coverage, targeting multiple key values and ecosystem types that are required to be reported on in all subcatchments for the Healthy Waterways Strategy. Importantly, a 'biobank' of samples created through the MERI sampling program presents opportunities to explore other methods or assays to detect additional taxa and provide additional value to the MERI program (e.g., native mussels, decapods, macroinvertebrates etc). Future improvements to the program could include exploring a multi-assay eDNA approach to potentially reduce costs while increasing detection sensitivity and taxonomic breadth (e.g., to incorporate additional key values), as well as the development of a simplified dashboard based on biodiversity metrics derived from MERI eDNA data.

Introduction

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Introduction

Environmental DNA

A key challenge for biodiversity conservation is the ability to detect species. Determining the presence or absence of a species is integral to making informed management decisions. Unfortunately, detecting species, particularly in an aquatic environment, can be difficult, time consuming, expensive, and often highly invasive. Analysis of environmental DNA (eDNA) is a relatively new, cheap, quick and non-invasive method for detecting species (Rees et al. 2014; McColl-Gausden et al. 2021; Thomsen and Willerslev 2015). As the name suggests, eDNA refers to the genetic material that an organism leaves behind in its environment. Quantitative comparisons with traditional sampling methods for fauna indicate that eDNA methods can be superior in terms of sensitivity and cost efficiency, particularly for scarce, elusive, or cryptic species (Biggs et al. 2015; Lugg et al. 2018; Smart et al. 2015; Thomsen et al. 2012; Valentini et al. 2016), enabling effective detection of cryptic species or species at low densities.

There are two main ways that eDNA can be used to detect species, targeting one species at a time (known as a single species or target species approach) or to detect many species at once (DNA metabarcoding). Target species methods focus on eDNA quantification from a single target species using probes that are specific to the species or population(s) of interest and generally use real-time quantitative polymerase chain reaction (qPCR) methods. Multi-species detection methods—also known as DNA metabarcoding—take a broader, community focused approach. High-throughput next generation sequencing (NGS) technologies for DNA sequencing enable all species from one or more target groups (e.g., vertebrates, fish, amphibians) to be identified (Taberlet et al. 2012).

These two eDNA methods are now being used routinely to monitor aquatic fauna including platypuses, fish, and amphibians across waterways, estuaries, and wetlands in Melbourne's catchments.

Healthy Waterways Strategy MERI eDNA program

Melbourne Water's Healthy Waterways Strategy (HWS) 2018-28 sets a 50-year vision for managing the health of rivers, wetlands, and estuaries in the Port Phillip and Westernport region, to protect and improve their value to the community (Melbourne Water, 2018). Critical to the effective delivery of the HWS is the monitoring of 'key values' throughout the three ecosystem types (rivers, wetlands, and estuaries) present in Melbourne Water's 69 sub-catchments, as part of the HWS Monitoring, Evaluation, Reporting and Improvement (MERI) framework (Melbourne Water, 2019). The key biological values in the HWS include native fish, birds, frogs, platypuses, macroinvertebrates, and vegetation.

Progress towards the HWS waterways targets for a subset of key values will be assessed as part of the MERI reporting framework in all 69 sub-catchments, including a subset of high-priority estuaries and high-priority wetlands that are representative of the more than 1400 wetlands that occur across Melbourne's catchments. Undertaking such a broad-scale monitoring program has previously required the use of multiple survey techniques, such as electrofishing, visual, netting, and acoustic surveys, that are costly, time-consuming, invasive, often lack sensitivity, and can be relatively risky for operators. Such a monitoring program would require considerable investment (e.g., tens of millions of dollars) to implement to a level where the status of key values could be assessed and reported on for the life of the HWS across all 69 subcatchments (Tingley et al., 2020).

Environmental DNA (eDNA) sampling offers a cost-effective tool for monitoring the HWS key values at a landscape scale and for providing status updates between 5-year reporting periods throughout all of Melbourne's 69 HWS sub-catchments, estuaries, and priority representative wetlands. In 2020, Melbourne Water developed an eDNA monitoring framework (Tingley, Wu & Weeks 2020) using eDNA qPCR and metabarcoding methods for reporting on the distributions of some of the key values in Melbourne's subcatchments that could feed into the HWS MERI framework. The data presented in the current report were collected according to a sampling design that maximised statistical power while minimising total costs (see Tingley, Wu & Weeks 2020 for details).

Different monitoring strategies were developed for each subcatchment, and the statistical power of each strategy to detect changes in species occupancy under a defined budget was assessed, to provide recommendations on

the optimal number of sampling sites per subcatchment, and to inform mid- and end-term HWS reporting and investment planning.

Building on over 10 years of research, the HWS MERI eDNA program, based on the monitoring strategy developed in Tingley, Wu & Weeks (2020), aimed to monitor key values including fish, frogs, birds, and platypuses, facilitating widespread, repeatable, and consistent biodiversity surveys at a scale not previously possible through traditional survey methods. The baseline data collection began in Spring 2021 and was completed in Spring 2023, and included data collected during two time periods (Spring and Autumn) from >1800 sites (waterways, estuaries, wetlands) across Melbourne Water's 69 subcatchments.

Key objectives

The primary objectives of this report were to:

- Evaluate the sampling intensity of the MERI eDNA program across subcatchments, catchments, time-periods, and habitat types;
- Summarise the taxonomic composition, habitat affiliation (terrestrial vs aquatic), and conservation status of key values detected via eDNA sampling;
- Compare the spatial distribution of eDNA detections to previous detections of pertinent taxa from Melbourne Water's database of species sightings.

Companion reports describe the sampling methodology (Hale, Impey & Weeks, 2024) and statistical power (Tingley, Hale & Weeks, in prep.) of the HWS MERI eDNA program. The current report, therefore, provides a brief overview of field sampling, and focuses on general biodiversity patterns at a high level.

Methods

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Methods

Sampling design

Tingley, Wu & Weeks (2020) developed a MERI framework for key values across Melbourne Water's subcatchments using a statistical power analysis based on site occupancy (Guillera-Arroita & Lahoz-Monfort, 2012). The eDNA-based monitoring framework aimed to detect changes in site occupancy at the sub-catchment scale between 5-year reporting periods. Because standardised presence-absence surveys had not previously been conducted across all sub-catchments, outputs of habitat suitability models (HSMs) for fish, developed by Melbourne Water, were used to estimate mean site occupancy probability in each sub-catchment. eDNA detection probabilities for some fish species, which were also needed for the power analysis, were derived from a study of 25 sites in Melbourne (McColl-Gausden et al., 2021) or were unavailable when the original analysis was conducted, necessitating the use of previous models and expert knowledge (Tingley, Wu & Weeks, 2020).

Data collation and filtering

We collated eDNA data that were collected during all five seasons of the MERI program (Spring 2021, Autumn 2022, Spring 2022, Autumn 2023, and Spring 2023). The final season was much shorter than the other four, and was aimed at visiting estuaries and wetlands that could not be accessed in previous seasons for various reasons (e.g., Covid lockdowns, flooding, accessibility issues). Collectively, these data included Platypus qPCR data from waterways, metabarcoding data from waterways and estuaries (using the vert amplicon), and metabarcoding data from wetlands (amphibian and vert amplicons). In the latter case, data from the two amplicons were combined by summing the number of sequencing reads per species and sample across amplicons. Similarly, because sample filters were halved and sequenced separately, total sequencing reads per sample was calculated by summing reads per species across the two filter halves. Samples with fewer than 5000 total sequencing reads of target taxa were excluded from further analysis to increase confidence in the detection/non-detection data. Samples with low read numbers were more prevalent during the early seasons of the MERI program than in latter seasons due to improvement in metabarcoding processes (Hale, Impey & Weeks, 2024), such as the introduction of unique dual indexes (UDI).

Detection data were checked for various typographical inconsistencies, such as incorrect spelling, inconsistent annotation, or taxonomic synonymy, and matched with internal EnviroDNA databases (e.g., to extract common names and native/non-native statuses). Scientific names present in the eDNA data were also matched against internal biodiversity datasets provided by Melbourne Water (provided by A. Danger, Melbourne Water).

Data from all five MERI sampling rounds was compiled and manipulated in R 4.3.0 (R Core Team 2023). The final dataset contains >1.5 million rows, where each row represents the detection/non-detection of target taxa in each sample.

Data summaries

We first summarise the MERI eDNA data in terms of spatial and temporal variation in sampling intensity, before summarising biodiversity attributes such as taxonomic composition (e.g. mammals vs fish), habitat affiliation (terrestrial vs aquatic), native/non-native status, and national and state-level conservation listings.

We also summarise the number of subcatchments in which each target taxon was detected via eDNA sampling, and compare these estimates with historic detections of the relevant taxon from Melbourne Water's database. The latter detections were collected using a variety of traditional sampling methods (e.g., electrofishing, netting, visual surveys, traps), and covered a much more extensive time period than the MERI eDNA program (we used detections post-2010 in our comparisons).

Interested users can download data and dynamically investigate spatial, temporal, and taxonomic patterns in biodiversity detected via eDNA sampling by engaging with a new interactive web application developed in R Shiny (https://envirodna.shinyapps.io/MWspatial/).

Results

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Results

General patterns

A total of 4,277 water samples from 1,925 spatially-distinct sites were processed for eDNA analysis as part of the MERI eDNA program. Sampling intensity within each habitat type was roughly constant across seasons (Table 1), with the exception of Spring 2023, as discussed above. See Hale, Impey & Weeks (2024) for a more detailed summary of the spatial and temporal distribution of sampling effort.

Table 1. Number of water samples collected in each habitat type and season.

Season	Habitat	Number of samples
Spring 2021	Estuary	85
	Waterway	709
	Wetland	129
Autumn 2022	Estuary	87
	Waterway	834
	Wetland	193
Spring 2022	Estuary	58
	Waterway	870
	Wetland	208
Autumn 2023	Estuary	51
	Waterway	845
	Wetland	157
Spring 2023	Estuary	2
	Wetland	49

Environmental DNA sampling resulted in 54,821 faunal detections of 355 taxa across all sampling seasons combined. Of these taxa, 238 (67%) were resolved at the species level, with an additional 115 (32.4%) resolved to the level of genus. In the next section, we break these patterns down at a finer spatial resolution, reporting on detected aquatic biodiversity and threatened species at the catchment-scale.

Catchment-level patterns
Dandenong

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Catchment-level patterns

Dandenong catchment

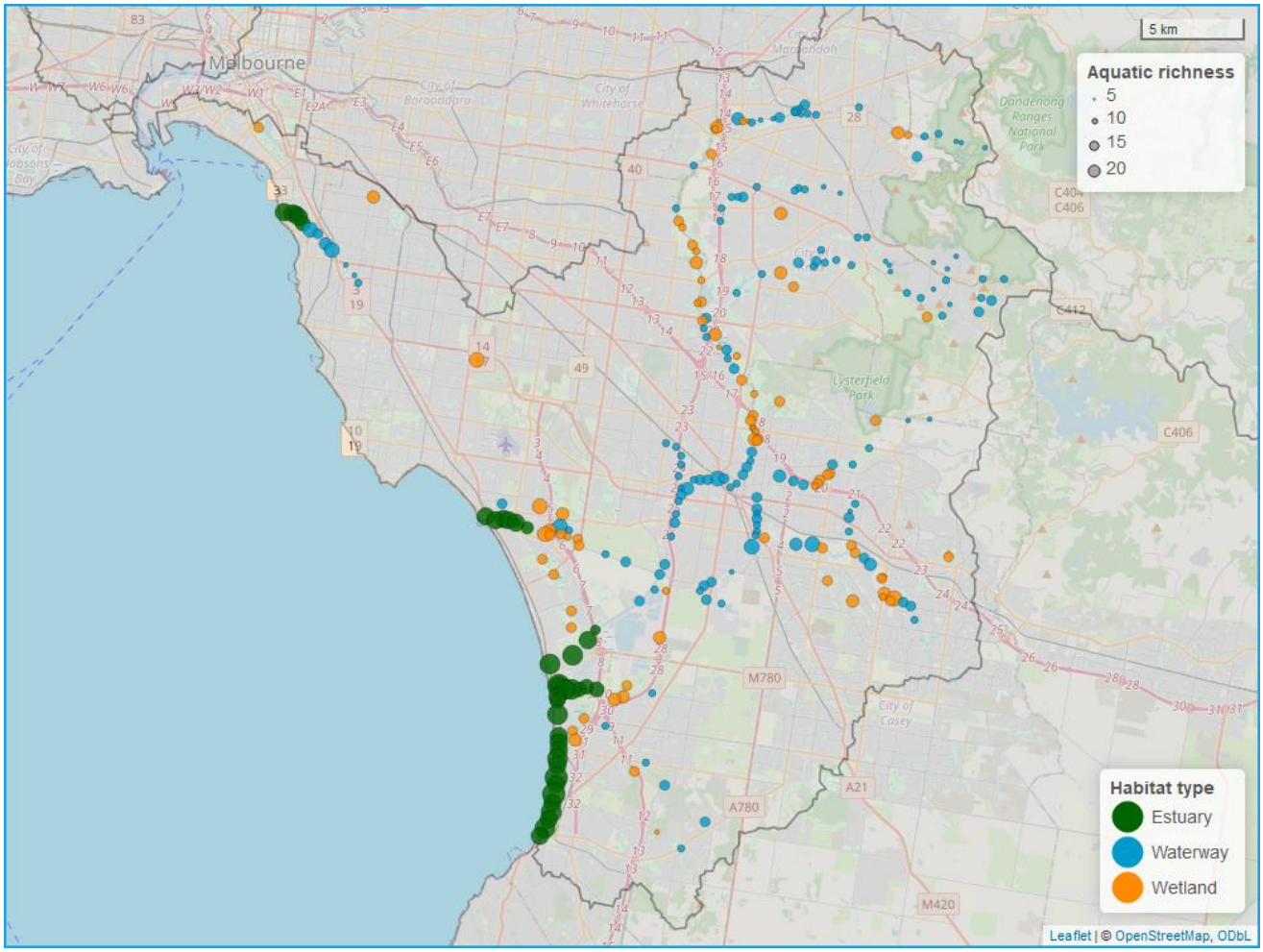

Fig. 1. Sites where eDNA samples were collected in the Dandenong catchment. Site colour reflects coarse habitat type, while site size is proportional to native aquatic taxa richness. Only sites in which one or more target taxa were detected are shown.

Six hundred and forty-six water samples were collected from 300 sites in the Dandenong catchment (Fig. 1). Across all sites and seasons combined, 204 aquatic and terrestrial taxa were detected (Fig. 1; 9,615 total detections). Thirty-five species detected in the Dandenong catchment are not native to Australia; 9 are listed under the EPBC Act; and 13 are on the VIC FFG Act Advisory Lists (Table 2). 78.9% of target taxa were resolved at the species level, whereas 20.6 % of target taxa were resolved to genus.

Table 2. Threatened target taxa in the Dandenong catchment.

Group	Taxonomy	Common name	List	Status (EPBC, FFG)
Amphibians	*Litoria raniformis*	Growling grass frog	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Birds	*Biziura lobata*	Musk duck	Vic FFG Act	Vulnerable
	Cereopsis novaehollandiae	Cape barren goose	EPBC Act	Vulnerable
	Charadrius mongolus	Lesser sand plover	EPBC Act, Vic FFG Act	Endangered, Endangered

Group	Taxonomy	Common name	List	Status (EPBC, FFG)
	Lewinia pectoralis	Lewin's rail	Vic FFG Act	Vulnerable
	Oxyura australis	Blue-billed duck	Vic FFG Act	Vulnerable
	Pycnoptilus floccosus	Pilotbird	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Fish	*Bidyanus bidyanus*	Silver perch	EPBC Act, Vic FFG Act	Endangered, Endangered
	Galaxiella pusilla	Dwarf galaxias	EPBC Act, Vic FFG Act	Endangered, Endangered
	Maccullochella peelii	Murray cod	EPBC Act, Vic FFG Act	Vulnerable, Endangered
	Prototroctes maraena	Australian grayling	EPBC Act, Vic FFG Act	Vulnerable, Endangered
Mammals	*Ornithorhynchus anatinus*	Platypus	Vic FFG Act	Vulnerable
	Pteropus poliocephalus	Grey-headed flying fox	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Reptiles	*Emydura macquarii*	Southern river turtles	Vic FFG Act	Critically Endangered

Catchment-level patterns
Maribyrnong

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Maribyrnong catchment

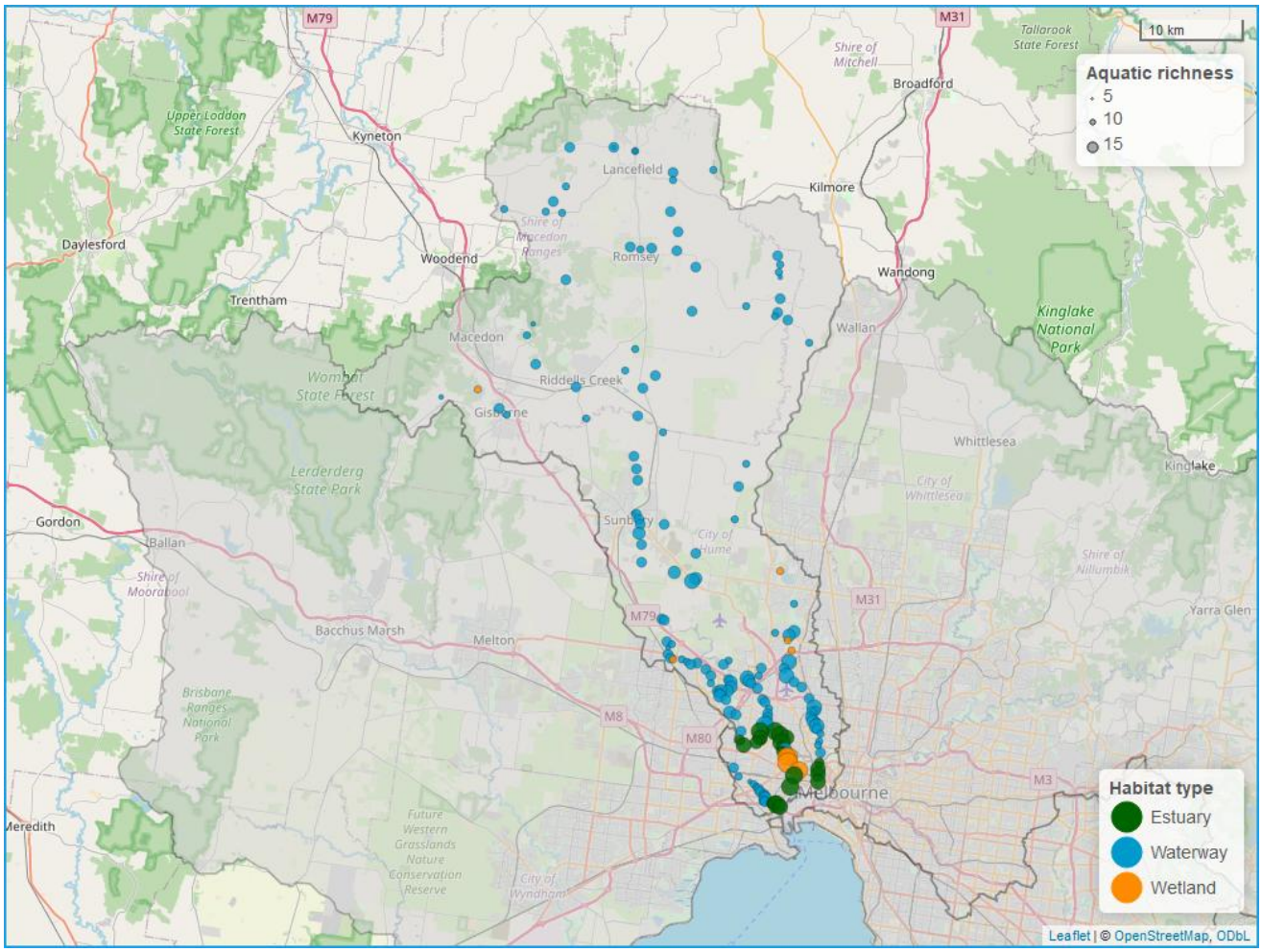

Fig. 2. Sites where eDNA samples were collected in the Maribyrnong catchment. Site colour reflects coarse habitat type, while site size is proportional to native aquatic taxa richness. Only sites in which one or more target taxa were detected are shown.

Four hundred and twenty-three water samples were collected from 174 sites in the Maribyrnong catchment (Fig. 2). Across all sites and seasons combined, 182 aquatic and terrestrial taxa were detected (Fig. 2; 5,765 total detections). Thirty-three species detected in the Maribyrnong catchment are not native to Australia; 7 are listed under the EPBC Act; and 8 are on the VIC FFG Act Advisory Lists (Table 3). 78.6% of target taxa were resolved at the species level, whereas 20.9 % of target taxa were resolved to genus.

Table 3. Threatened target taxa in the Maribyrnong catchment.

Group	Taxonomy	Common name	List	Status (EPBC, FFG)
Amphibians	*Litoria raniformis*	Growling grass frog	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Birds	*Aphelocephala leucopsis*	Southern whiteface	EPBC Act	Vulnerable
	Cereopsis novaehollandiae	Cape barren goose	EPBC Act	Vulnerable
	Lewinia pectoralis	Lewin's rail	Vic FFG Act	Vulnerable
	Oxyura australis	Blue-billed duck	Vic FFG Act	Vulnerable
Fish	*Nannoperca obscura*	Yarra pygmy perch	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable

Group	Taxonomy	Common name	List	Status (EPBC, FFG)
	Prototroctes maraena	Australian grayling	EPBC Act, Vic FFG Act	Vulnerable, Endangered
Mammals	*Ornithorhynchus anatinus*	Platypus	Vic FFG Act	Vulnerable
	Pteropus poliocephalus	Grey-headed flying fox	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Reptiles	*Emydura macquarii*	Southern river turtles	Vic FFG Act	Critically Endangered
	Tiliqua scincoides	Eastern blue-tongue lizard	EPBC Act	Critically Endangered

Catchment-level patterns
Werribee

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Werribee catchment

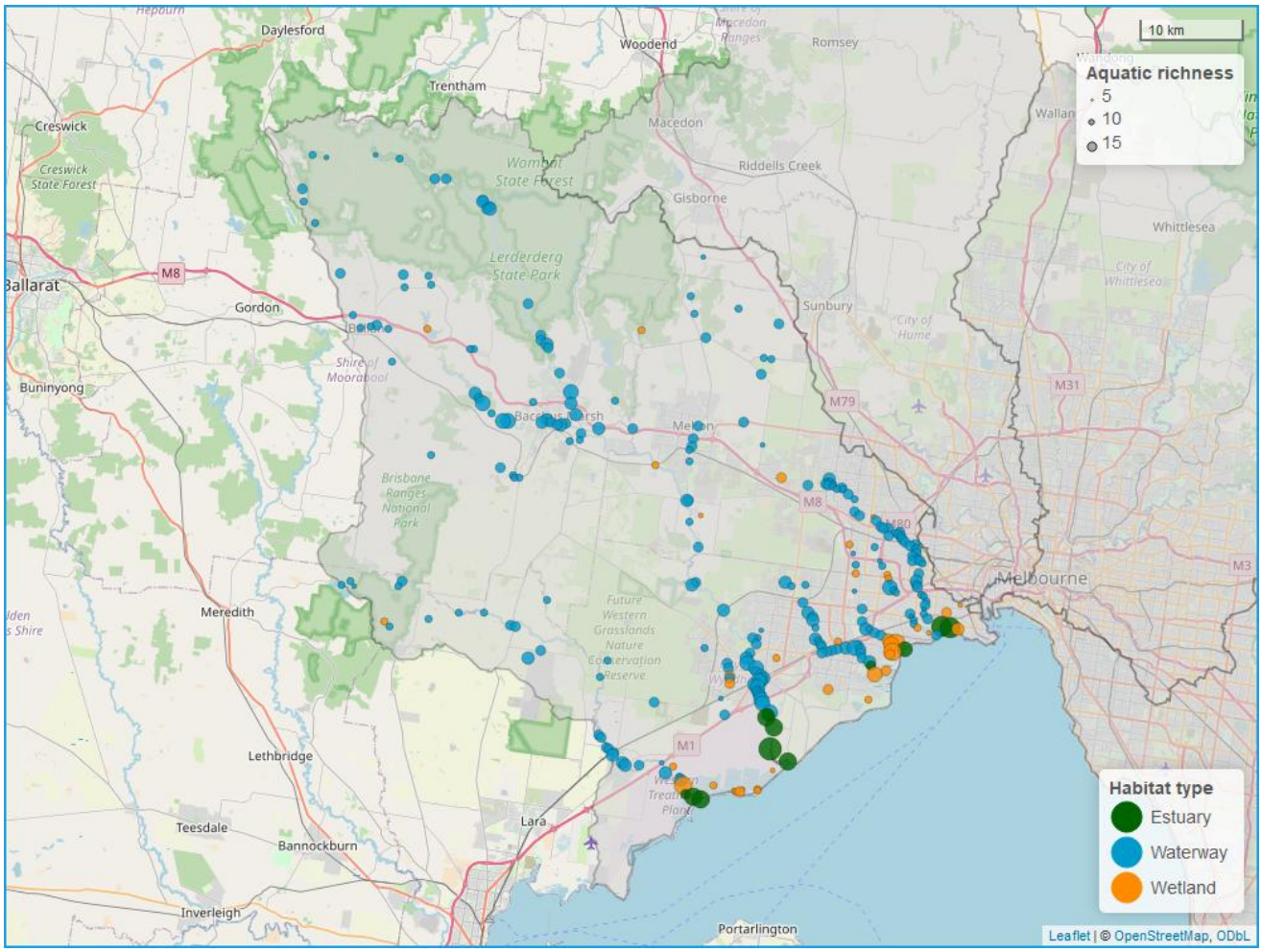

Fig. 3. Sites where eDNA samples were collected in the Werribee catchment. Site colour reflects coarse habitat type, while site size is proportional to native aquatic taxa richness. Only sites in which one or more target taxa were detected are shown.

Six hundred and ninety-six water samples were collected from 299 sites in the Werribee catchment (Fig. 3). Across all sites and seasons combined, 206 aquatic and terrestrial taxa were detected (Fig. 3; 7,572 total detections). Thirty-four species detected in the Werribee catchment are not native to Australia; 6 are listed under the EPBC Act; and 11 are on the VIC FFG Act Advisory Lists (Table 4). 77.7% of target taxa were resolved at the species level, whereas 21.8 % of target taxa were resolved to genus.

Table 4. Threatened target taxa in the Werribee catchment.

Group	Taxonomy	Common name	List	Status (EPBC, FFG)
Amphibians	*Litoria raniformis*	Growling grass frog	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Birds	*Ardea intermedia*	Intermediate egret	Vic FFG Act	Critically Endangered
	Biziura lobata	Musk duck	Vic FFG Act	Vulnerable
	Cereopsis novaehollandiae	Cape barren goose	EPBC Act	Vulnerable
	Lewinia pectoralis	Lewin's rail	Vic FFG Act	Vulnerable
	Oxyura australis	Blue-billed duck	Vic FFG Act	Vulnerable

Group	Taxonomy	Common name	List	Status (EPBC, FFG)
Fish	*Bidyanus bidyanus*	Silver perch	EPBC Act, Vic FFG Act	Endangered, Endangered
	Prototroctes maraena	Australian grayling	EPBC Act, Vic FFG Act	Vulnerable, Endangered
Mammals	*Ornithorhynchus anatinus*	Platypus	Vic FFG Act	Vulnerable
	Petauroides volans	Greater glider	EPBC Act, Vic FFG Act	Endangered, Endangered
	Pteropus poliocephalus	Grey-headed flying fox	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Reptiles	*Emydura macquarii*	Southern river turtles	Vic FFG Act	Critically Endangered

Catchment-level patterns
Westernport

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Westernport catchment

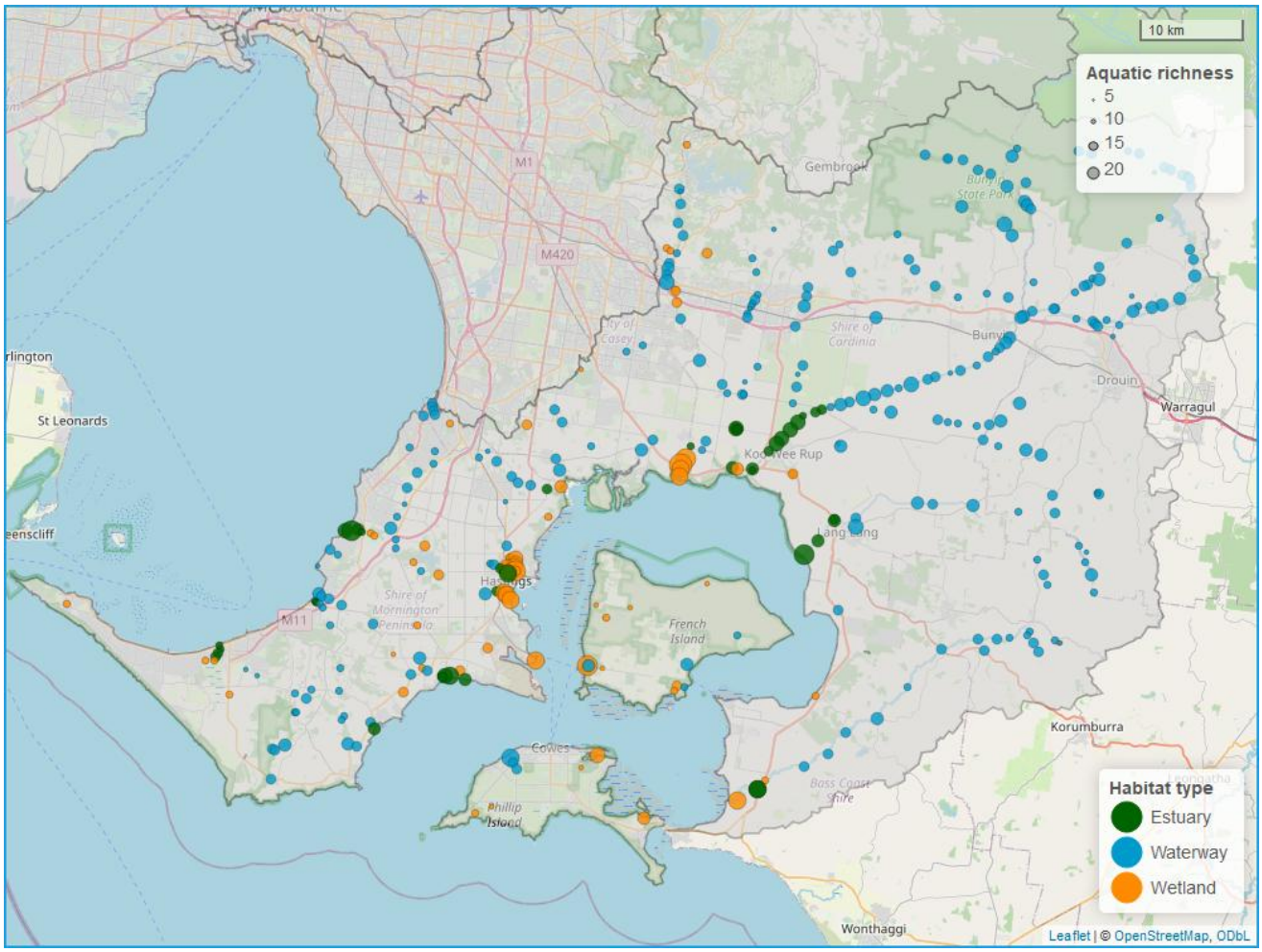

Fig. 4. Sites where eDNA samples were collected in the Westernport catchment. Site colour reflects coarse habitat type, while site size is proportional to native aquatic taxa richness. Only sites in which one or more target taxa were detected are shown.

Eight hundred and fifty-nine water samples were collected from 383 sites in the Westernport catchment (Fig. 4). Across all sites and seasons combined, 254 aquatic and terrestrial taxa were detected (Fig. 4; 9,818 total detections). Thirty-two species detected in the Westernport catchment are not native to Australia; 13 are listed under the EPBC Act; and 17 are on the VIC FFG Act Advisory Lists (Table 5). 71.3% of target taxa were resolved at the species level, whereas 28.3 % of target taxa were resolved to genus.

Table 5. Threatened target taxa in the Westernport catchment.

Group	Taxonomy	Common name	List	Status (EPBC, FFG)
Birds	*Biziura lobata*	Musk duck	Vic FFG Act	Vulnerable
	Cereopsis novaehollandiae	Cape barren goose	EPBC Act	Vulnerable
	Charadrius mongolus	Lesser sand plover	EPBC Act, Vic FFG Act	Endangered, Endangered
	Lewinia pectoralis	Lewin's rail	Vic FFG Act	Vulnerable
	Oxyura australis	Blue-billed duck	Vic FFG Act	Vulnerable
Fish	*Bidyanus bidyanus*	Silver perch	EPBC Act, Vic FFG Act	Endangered, Endangered

Group	Taxonomy	Common name	List	Status (EPBC, FFG)
	Galaxiella pusilla	Dwarf galaxias	EPBC Act, Vic FFG Act	Endangered, Endangered
	Mugilogobius platynotus	Pale mangrove goby	Vic FFG Act	Endangered
	Neochanna cleaveri	Australian mudfish	Vic FFG Act	Endangered
	Prototroctes maraena	Australian grayling	EPBC Act, Vic FFG Act	Vulnerable, Endangered
Mammals	*Isoodon obesulus*	Southern brown bandicoot	EPBC Act, Vic FFG Act	Endangered, Endangered
	Mastacomys fuscus	Broad-toothed rat	EPBC Act, Vic FFG Act	Endangered, Vulnerable
	Ornithorhynchus anatinus	Platypus	Vic FFG Act	Vulnerable
	Perameles gunnii	Eastern barred bandicoot	EPBC Act, Vic FFG Act	Endangered, Endangered
	Petauroides volans	Greater glider	EPBC Act, Vic FFG Act	Endangered, Endangered
	Petaurus australis	Yellow-bellied glider	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
	Potorous tridactylus	Long-nosed potoroo	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
	Pteropus poliocephalus	Grey-headed flying fox	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Reptiles	*Tiliqua scincoides*	Eastern blue-tongue lizard	EPBC Act	Critically Endangered

Catchment-level patterns
Yarra

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Yarra catchment

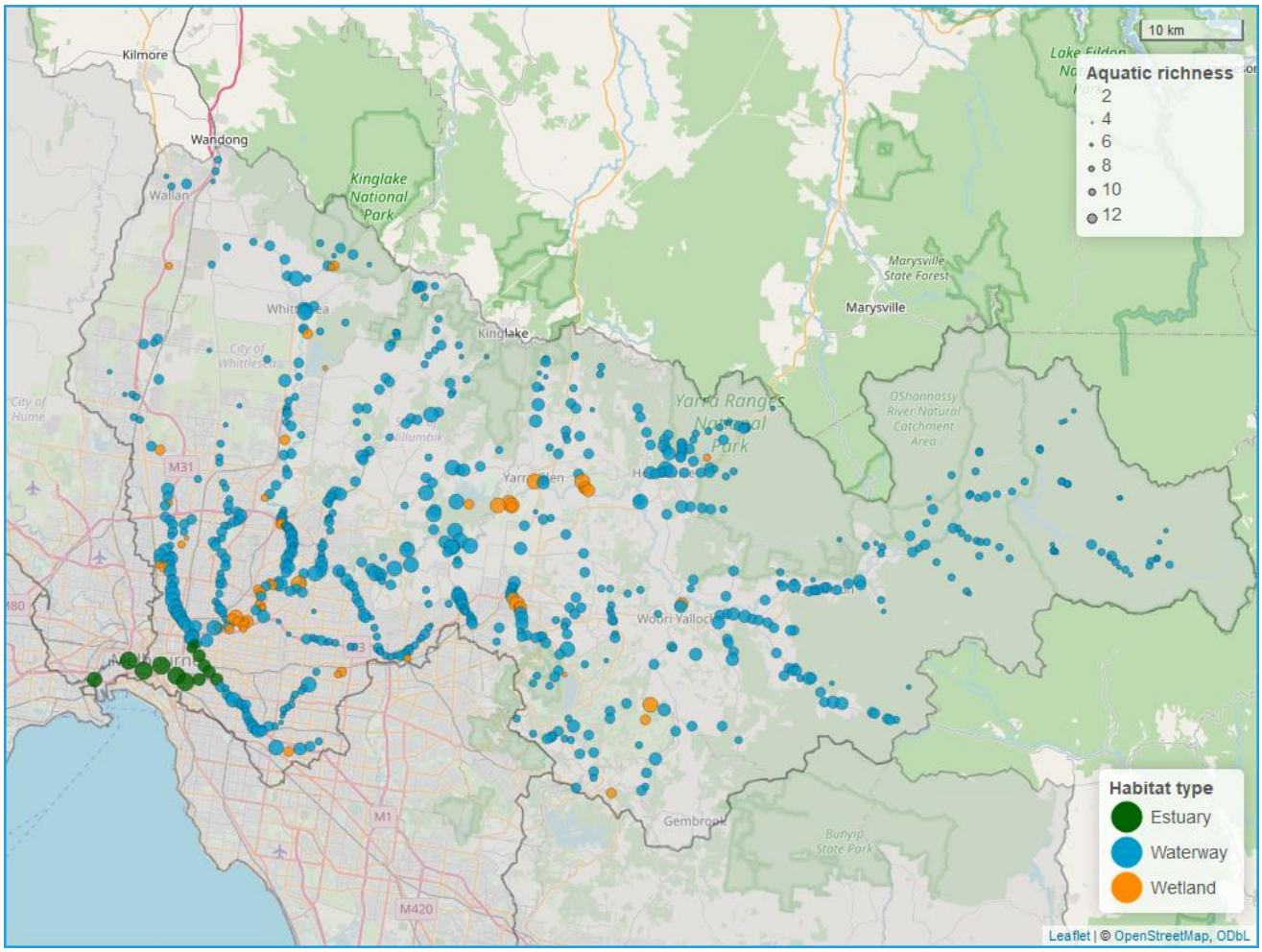

Fig. 5. Sites where eDNA samples were collected in the Yarra catchment. Site colour reflects coarse habitat type, while site size is proportional to native aquatic taxa richness. Only sites in which one or more target taxa were detected are shown.

One thousand six hundred and fifty-three water samples were collected from 769 sites in the Yarra catchment (Fig. 5). Across all sites and seasons combined, 246 aquatic and terrestrial taxa were detected (Fig. 5; 22,051 total detections). Thirty-eight species detected in the Yarra catchment are not native to Australia; 14 are listed under the EPBC Act; and 17 are on the VIC FFG Act Advisory Lists (Table 6). 75.2% of target taxa were resolved at the species level, whereas 24.4 % of target taxa were resolved to genus.

Table 6. Threatened target taxa in the Yarra catchment.

Group	Taxonomy	Common name	List	Status (EPBC, FFG)
Amphibians	*Litoria raniformis*	Growling grass frog	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Birds	*Biziura lobata*	Musk duck	Vic FFG Act	Vulnerable
	Cereopsis novaehollandiae	Cape barren goose	EPBC Act	Vulnerable
	Charadrius mongolus	Lesser sand plover	EPBC Act, Vic FFG Act	Endangered, Endangered
	Lewinia pectoralis	Lewin's rail	Vic FFG Act	Vulnerable
	Oxyura australis	Blue-billed duck	Vic FFG Act	Vulnerable

Group	Taxonomy	Common name	List	Status (EPBC, FFG)
	Pycnoptilus floccosus	Pilotbird	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Fish	*Bidyanus bidyanus*	Silver perch	EPBC Act, Vic FFG Act	Endangered, Endangered
	Maccullochella peelii	Murray cod	EPBC Act, Vic FFG Act	Vulnerable, Endangered
	Macquaria australasica	Macquarie perch	EPBC Act, Vic FFG Act	Endangered, Endangered
	Prototroctes maraena	Australian grayling	EPBC Act, Vic FFG Act	Vulnerable, Endangered
Mammals	*Mastacomys fuscus*	Broad-toothed rat	EPBC Act, Vic FFG Act	Endangered, Vulnerable
	Ornithorhynchus anatinus	Platypus	Vic FFG Act	Vulnerable
	Petauroides volans	Greater glider	EPBC Act, Vic FFG Act	Endangered, Endangered
	Petaurus australis	Yellow-bellied glider	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
	Phascogale tapoatafa	Brush-tailed phascogale	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
	Pteropus poliocephalus	Grey-headed flying fox	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Reptiles	*Emydura macquarii*	Southern river turtles	Vic FFG Act	Critically Endangered
	Tiliqua scincoides	Eastern blue-tongue lizard	EPBC Act	Critically Endangered

Detections

Aquatic Taxa

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Detections of aquatic taxa

Aquatic taxa, including members of the classes Amphibia, Chondrichthyes, Hyperoartia, and Actinopteri, as well as the Platypus, were detected widely across the five surveyed catchments (Fig. 11), but were less frequently detected than their terrestrial counterparts. However, the greater number of terrestrial detections is unsurprising, given the much greater diversity among terrestrial fauna. The vast majority of aquatic taxa (98 taxa, 75.6% of aquatic detections) belonged to the class Actinopteri (ray-finned fish; Fig. 12). Among aquatic taxa detected via eDNA sampling, 15 were not native to Australia.

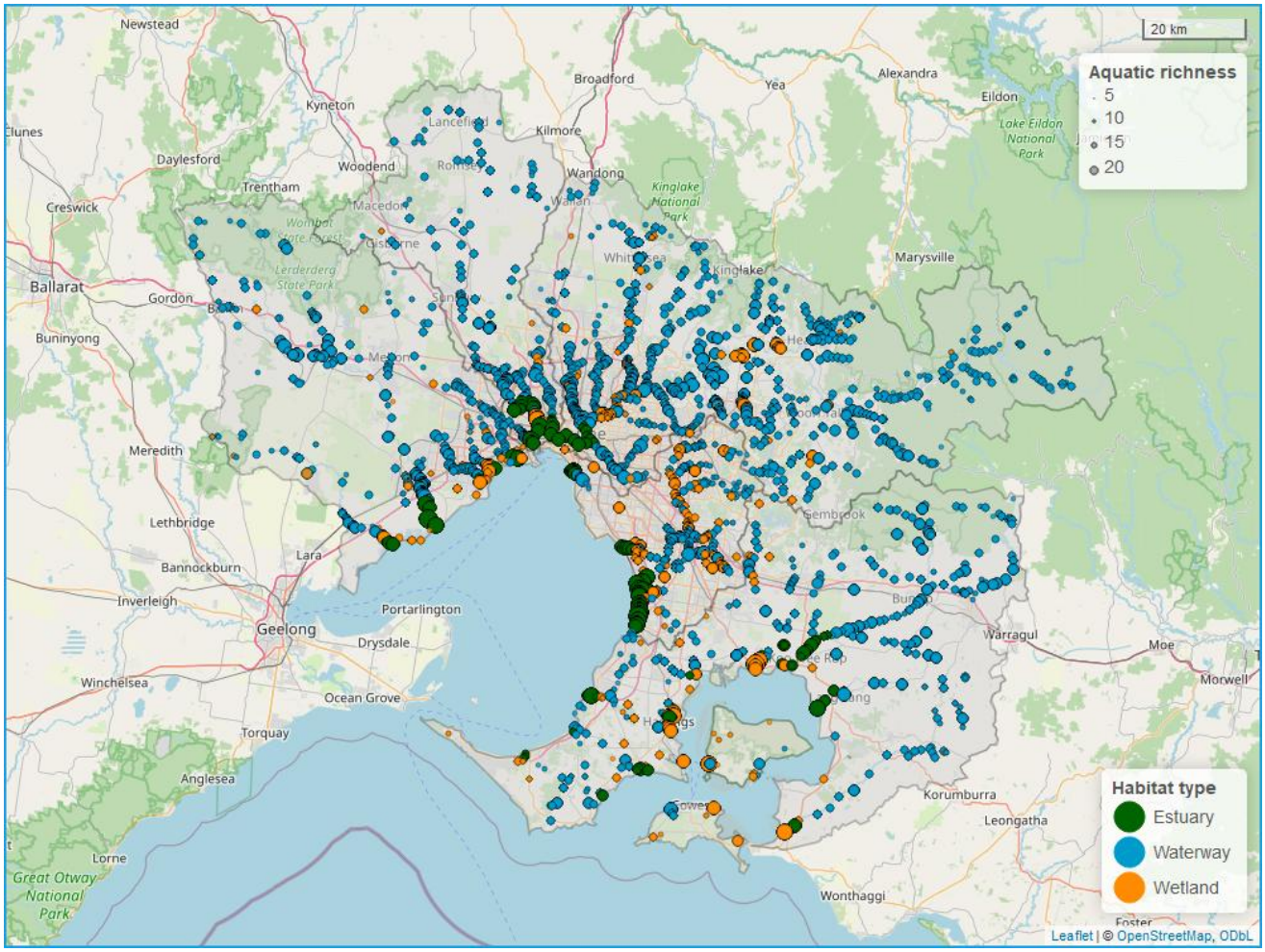

Fig. 11. Number of native aquatic taxa detected at each site, across survey seasons. Aquatic taxa include members of the classes Amphibia, Chondrichthyes, Hyperoartia, and Actinopteri, as well as the Platypus. Only sites in which one or more target taxa were detected are shown.

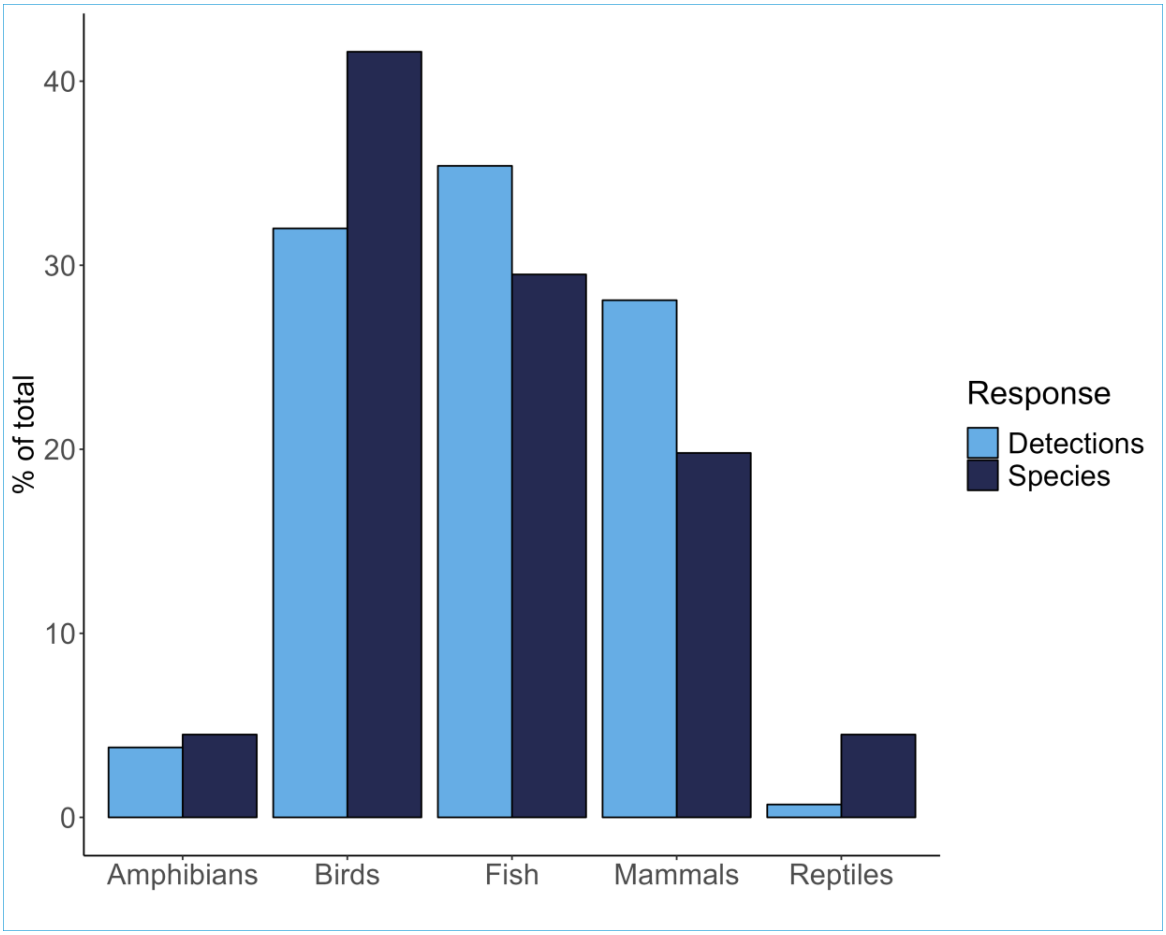

Fig. 12. Percentage of total detections (samples with metabarcoding reads >0) and of target taxa, by taxonomic group. The 'Fish' category includes taxa from Chondrichthyes, Hyperoartia, and Actinopteri.

Comparing aquatic eDNA detections against the Melbourne Water database

The two tables below compare the number of Melbourne Water subcatchments in which each taxon was detected via eDNA sampling, compared to the same metric derived from the Melbourne Water database (2010-2024). Note that the number of subcatchments in which a species was detected with eDNA sampling can be underestimated when closely related taxa are not resolved to the species level. *Limnodynastes* sp, for example, could represent a haplotype of *Limnodynastes tasmaniensis*, *L. peronii*, or *L. dumerilii* for which we have no reference sequence and therefore are unable to accurately assign to species level. Because the current data do not allow us to differentiate between species in such cases, eDNA data may underestimate the *true* number of occupied subcatchments for one of the three species in this fictitious example.

Interestingly, 75 species listed in Table 7 (98.7%) were detected via eDNA sampling in one or more new subcatchments in which there is no record from Melbourne Water's catch database post-2010 (minimum number of new subcatchments = 1, maximum = 46).

Table 7. The number of Melbourne Water (MW) subcatchments in which Chondrichthyans (cartilaginous fish), Hyperoartians (lamprey), and Actinopterians (ray-finned fish) were detected via eDNA sampling, compared to detections in the MW database recorded after 2010. Columns show, from left to right, the number of subcatchments in which a taxon was (i) present in both databases; (ii) present in only the MERI eDNA database; (iii) absent in both databases; and (iv) present in only the MW database. The final two columns show the total number of subcatchments in which a taxon was detected in (v) the eDNA database and (vi) the MW database. Note that all values other than category (v) are omitted for target taxa that could not be resolved to species-level

via eDNA sampling, as genus- and family-level detections are rare and inconsistently documented in the MW database.

Taxa	Common name	eDNA & MW	eDNA	Neither	MW	eDNA total	MW total
Acanthaluteres sp		-	-	-	-	3	-
Acanthogobius flavimanus	Yellowfin goby	8	7	53	1	15	9
Acanthopagrus butcheri	Black bream	10	13	44	2	23	12
Acentrogobius pflaumii	Striped sandgoby	0	1	68	0	1	0
Acentrogobius sp		-	-	-	-	1	-
Afurcagobius tamarensis	Tamar goby	12	9	46	2	21	14
Aldrichetta forsteri	Yelloweye mullet	12	12	45	0	24	12
Alopias sp		-	-	-	-	1	-
Ammotretis rostratus	Longsnout flounder	1	3	60	5	4	6
Anguilla australis	Short finned eel	52	17	0	0	69	52
Anguilla reinhardtii	Longfin eel	0	5	62	2	5	2
Anguilla sp		-	-	-	-	3	-
Arenigobius bifrenatus	Bridled goby	9	9	50	1	18	10
Arenigobius frenatus	Halfbridled goby	8	10	50	1	18	9
Argyrosomus japonicus	Mulloway	1	0	67	1	1	2
Arripis trutta	Australian salmon	0	3	55	11	3	11
Atherinosoma microstoma	Small-mouth hardyhead	10	11	46	2	21	12
Bidyanus bidyanus	Silver perch	0	7	62	0	7	0
Brachaluteres jacksonianus	Southern pygmy leatherjacket	0	1	68	0	1	0
Carassius auratus	Gold fish	26	34	8	1	60	27
Chrysophrys auratus	Snapper	1	17	50	1	18	2
Cyprinidae sp		-	-	-	-	2	-
Cyprinus carpio	Common carp	28	37	4	0	65	28
Dasyatis thetidis	Cow stingray	0	1	68	0	1	0
Decapterus sp		-	-	-	-	2	-
Dentex sp		-	-	-	-	3	-
Diodon nicthemerus	Globefish	0	1	68	0	1	0
Diodon sp		-	-	-	-	2	-
Emmelichthys sp		-	-	-	-	1	-
Engraulis australis	Australian anchovy	1	1	65	2	2	3
Epigonus sp		-	-	-	-	1	-
Gadopsis marmoratus	River blackfish	17	11	40	1	28	18
Galaxias brevipinnis	Climbing galaxias	9	38	21	1	47	10
Galaxias maculatus	Common galaxias	41	21	3	4	62	45
Galaxias ornatus	Ornate galaxias	20	17	30	2	37	22
Galaxias truttaceus	Spotted galaxias	9	15	42	3	24	12
Galaxiella pusilla	Dwarf galaxias	5	3	60	1	8	6
Gambusia holbrooki	Mosquito fish	37	28	3	1	65	38

Taxa	Common name	eDNA & MW	eDNA	Neither	MW	eDNA total	MW total
Geotria australis	Pouched lamprey	0	13	56	0	13	0
Girella tricuspidata	Luderick	1	5	61	2	6	3
Girella zebra	Zebra fish	0	2	67	0	2	0
Gobiopterus semivestitus	Glassgoby	9	7	50	3	16	12
Haletta semifasciata	Blue weed whiting	0	2	67	0	2	0
Heteroclinus heptaeolus	Seven-bar weedfish	0	3	66	0	3	0
Heteroclinus sp		-	-	-	-	2	-
Hipposcarus sp		-	-	-	-	1	-
Hyperlophus sp		-	-	-	-	2	-
Hyperlophus vittatus	Sandy sprats	4	9	54	2	13	6
Hypseleotris sp		-	-	-	-	16	-
Lates calcarifer	Barramundi	0	9	59	1	9	1
Liza argentea	Goldspot mullet	3	12	54	0	15	3
Maccullochella peelii	Murray cod	2	5	62	0	7	2
Macquaria ambigua	Golden perch	1	14	53	1	15	2
Macquaria australasica	Macquarie perch	5	2	57	5	7	10
Macquaria colonorum	Estuary perch	4	20	44	1	24	5
Meuschenia trachylepis	Yellowfin leatherjacket	0	2	67	0	2	0
Misgurnus anguillicaudatus	Oriental weatherloach	17	24	28	0	41	17
Mugil cephalus	Sea mullet	1	9	56	3	10	4
Mugilidae sp		-	-	-	-	1	-
Mugilogobius platynotus	Pale mangrove goby	2	2	65	0	4	2
Myliobatidae sp		-	-	-	-	1	-
Nannoperca australis	Southern pygmy perch	0	46	23	0	46	0
Nannoperca obscura	Yarra pygmy perch	0	1	68	0	1	0
Neochanna cleaveri	Australian mudfish	0	1	68	0	1	0
Neoodax balteatus	Little weed whiting	0	3	65	1	3	1
Notolabrus fucicola	Yellow-saddled wrasse	0	1	68	0	1	0
Notorynchus cepedianus	Cowshark	0	2	67	0	2	0
Olisthops cyanomelas	Herring cale	0	1	68	0	1	0
Oncorhynchus mykiss	Rainbow trout	3	24	42	0	27	3
Pagrus sp		-	-	-	-	1	-
Parargyrops sp		-	-	-	-	1	-
Perca fluviatilis	Redfin perch	27	28	14	0	55	27
Percichthyidae sp		-	-	-	-	1	-
Philypnodon grandiceps	Flathead gudgeon	27	29	10	3	56	30
Philypnodon macrostomus	Dwarf flathead gudgeon	0	1	67	1	1	1
Platycephalus sp		-	-	-	-	6	-
Polyprion sp		-	-	-	-	1	-

Taxa	Common name	eDNA & MW	eDNA	Neither	MW	eDNA total	MW total
Pristiophorus nudipinnis	Southern saw shark	0	1	68	0	1	0
Prototroctes maraena	Australian grayling	6	5	56	2	11	8
Pseudaphritis urvillii	Tupong	19	12	36	2	31	21
Pseudogobius olorum	Bluespot goby	0	23	46	0	23	0
Pseudomugil sp		-	-	-	-	1	-
Redigobius macrostoma	Largemouth goby	3	3	62	1	6	4
Retropinna semoni	Australian smelt	18	24	27	0	42	18
Rhombosolea tapirina	Greenback flounder	1	5	53	10	6	11
Rhynchobatus sp		-	-	-	-	5	-
Rutilus rutilus	Roach	24	17	27	1	41	25
Salmo salar	Atlantic salmon	0	1	68	0	1	0
Salmo sp		-	-	-	-	1	-
Salmo trutta	Brown trout	24	24	21	0	48	24
Salvelinus fontinalis	Brook trout	0	2	67	0	2	0
Salvelinus sp		-	-	-	-	1	-
Scobinichthys granulatus	Rough leatherjacket	0	3	66	0	3	0
Seriola lalandi	Yellowtail kingfish	0	1	68	0	1	0
Siganus sp		-	-	-	-	1	-
Sillaginodes punctatus	King george whiting	1	3	61	4	4	5
Sparidae sp		-	-	-	-	3	-
Stigmatopora nigra	Widebody pipefish	1	2	64	2	3	3
Tasmanogobius lasti	Scary's tasmangoby	4	5	59	1	9	5
Tetractenos glaber	Smooth toadfish	10	11	48	0	21	10
Thunnus albacares	Yellowfin tuna	0	1	68	0	1	0
Thunnus sp		-	-	-	-	1	-
Tinca tinca	Tench	13	14	42	0	27	13
Tridentiger trigonocephalus	Trident goby	0	1	64	4	1	4

Similar to the results for fish, eDNA sampling detected all 12 frog species (100%) in one or more new subcatchments in which they had not previously been detected by Melbourne Water (minimum number of new subcatchments = 1, maximum = 11; Table 8; Fig. 13).

Table 8. The number of Melbourne Water (MW) subcatchments in which amphibian taxa were detected via eDNA sampling, compared to detections in the MW database recorded after 2010. Columns show, from left to right, the number of subcatchments in which a taxon was (i) present in both databases; (ii) present in only the MERI eDNA database; (iii) absent in both databases; and (iv) present in only the MW database. The final two columns show the total number of subcatchments in which a taxon was detected in (v) the eDNA database and (vi) the MW database. Note that all values other than category (v) are ommitted for target taxa that could not be resolved to species-level via eDNA sampling, as genus- and family-level detections are rare and inconsistently documented in the MW database.

Taxa	Common name	eDNA & MW	eDNA	Neither	MW	eDNA total	MW total
Crinia parinsignifera	Eastern sign-bearing froglet (plains froglet)	1	3	59	6	4	7
Crinia signifera	Eastern common froglet	61	6	2	0	67	61

Taxa	Common name	eDNA & MW	eDNA	Neither	MW	eDNA total	MW total
Geocrinia victoriana	Eastern smooth frog (victorian smooth froglet)	5	9	45	10	14	15
Limnodynastes dumerilii	Eastern banjo frog	50	11	3	5	61	55
Limnodynastes peronii	Brown-striped frog (striped marsh frog)	31	11	16	11	42	42
Limnodynastes sp		-	-	-	-	1	-
Limnodynastes tasmaniensis	Spotted grass frog (spotted marsh frog)	43	11	5	10	54	53
Lissotriton vulgaris	Common newt or smooth newt	0	1	68	0	1	0
Litoria ewingii OR Litoria verreauxii		-	-	-	-	52	-
Litoria fallax	Eastern dwarf tree frog	1	3	56	9	4	10
Litoria lesueurii	Lesueur's frog (rocky river frog)	1	4	64	0	5	1
Litoria peronii	Peron's tree frog	8	11	36	14	19	22
Litoria raniformis	Growling grass frog	7	3	45	14	10	21
Litoria sp		-	-	-	-	8	-
Neobatrachus sudelli	Sudell's frog (common spadefoot toad)	2	4	61	2	6	4
Pseudophryne sp		-	-	-	-	1	-

To visually summarise the extent of new aquatic detections, Fig. 14 illustrates the number of subcatchments occupied by fish and frog species, according to the MERI eDNA data, that previously held no Melbourne Water detections.

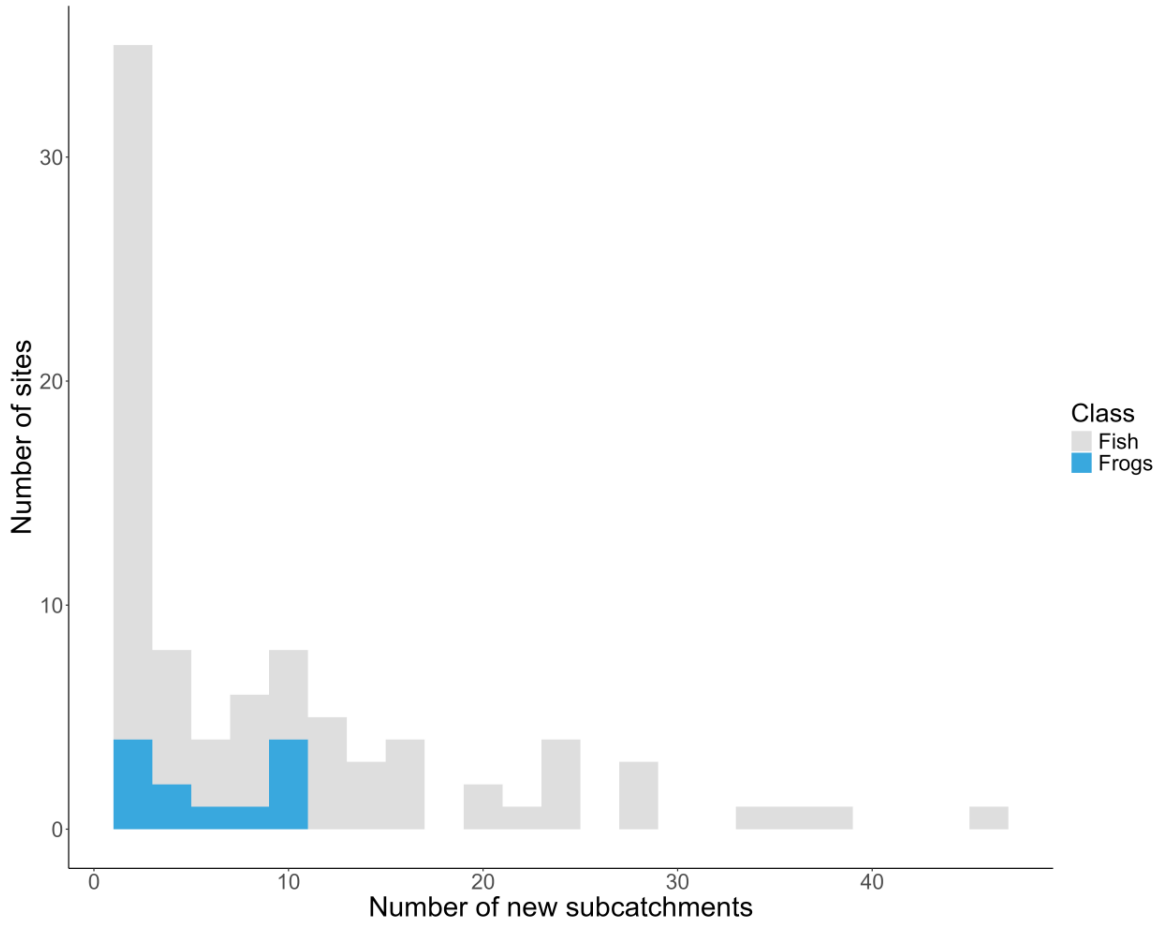

Fig. 14. Number of new subcatchments in which fish and frog species were detected via eDNA sampling, compared to historic Melbourne Water detections.

An alternative way to compare detections between the MERI eDNA data and the Melbourne Water database is to assess the correlation between the number of subcatchments occupied by each species in each dataset. If spatial patterns in species distributions revealed by eDNA data align with historical Melbourne Water detections, then a moderate-strong positive correlation should exist between the two datasets. For this comparison, only target taxa resolved at the species level are included. Fig. 15 shows this correlation for fish and frog detections. We can see that the number of occupied subcatchments is, overall, quite similar between data sources. The correlation between data sources regarding the number of occupied subcatchments was stronger for frogs than it was for fish, although the latter comparison involved more than 6 times as many species (12 frog species vs. 76 fish species). This not only reflects relative species richness of the two groups, but could also be linked to the relative number of samples collected in waterways vs. wetlands. The 1:1 lines shown in Fig. 15 demonstrate *why* the observed correlation was weaker for fish: eDNA sampling generally detected fish taxa in a greater number of subcatchments than revealed by the historic Melbourne Water data.

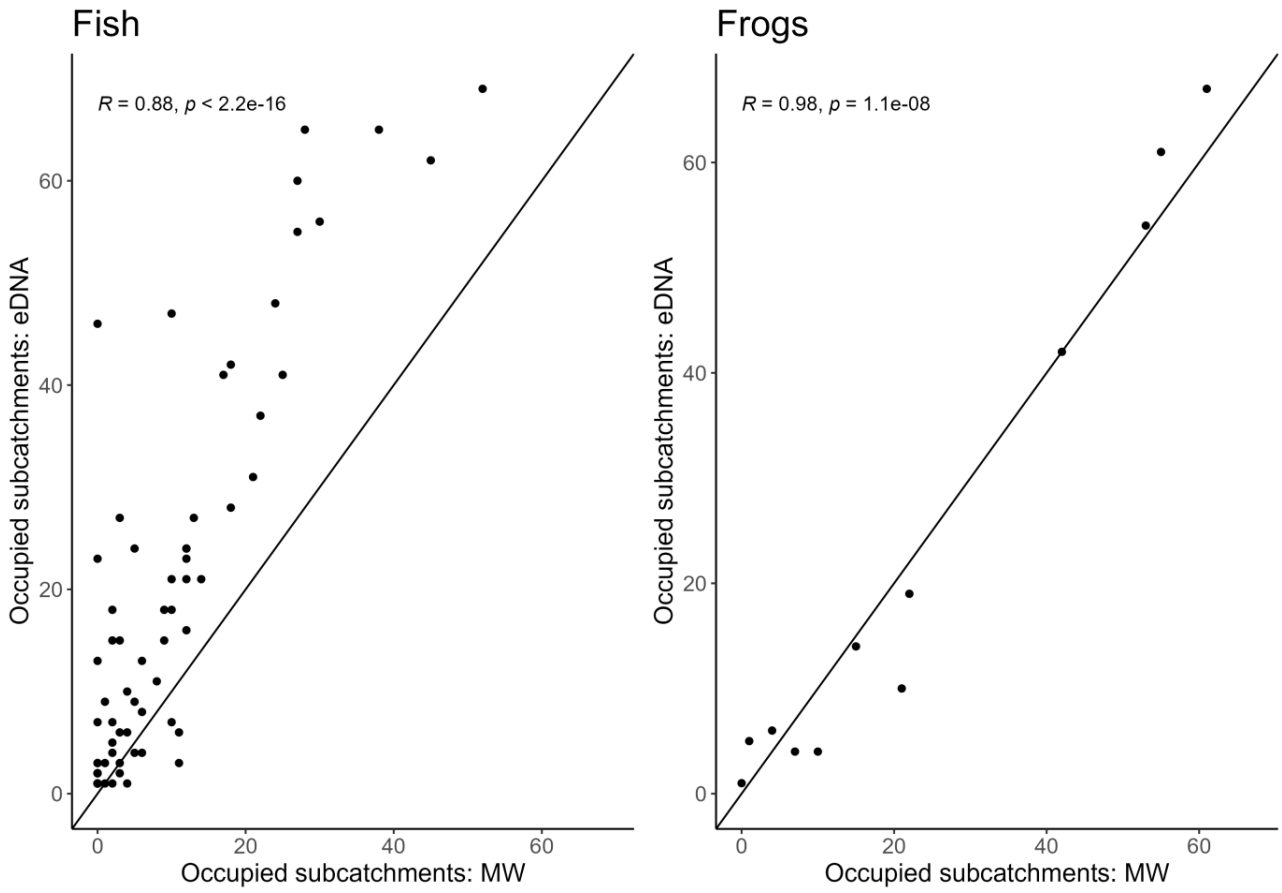

Fig. 15. Correlation between the number of subcatchments occupied by each species in the Melbourne Water and MERI eDNA datasets.

In the section that follows, we summarise a handful of aquatic case studies that demonstrate the power of the MERI eDNA program for generating new biodiversity insights across Melbourne Water's catchments. Detections of terrestrial fauna and associated case studies are summarised in the Section entitled 'Detections of terrestrial taxa', found below.

Case study

Threatened aquatic species

EnviroDNA

Melbourne Water

2020-2024
MERI eDNA
Program Report

Case study 1: Threatened aquatic species

Seven aquatic species were listed under the federal EPBC Act, whereas 10 species were listed in Victoria (VIC FFG Act Advisory Lists; Table 9). Most threatened aquatic species were fish (8 fish; 1 amphibian, and 1 mammal species were threatened).

Table 9. Threatened aquatic species detected in the MERI eDNA program.

Group	Taxonomy	List	Status
Amphibians	*Litoria raniformis*	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Fish	*Bidyanus bidyanus*	EPBC Act, Vic FFG Act	Endangered, Endangered
	Galaxiella pusilla	EPBC Act, Vic FFG Act	Endangered, Endangered
	Maccullochella peelii	EPBC Act, Vic FFG Act	Vulnerable, Endangered
	Macquaria australasica	EPBC Act, Vic FFG Act	Endangered, Endangered
	Mugilogobius platynotus	Vic FFG Act	Endangered
	Nannoperca obscura	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
	Neochanna cleaveri	Vic FFG Act	Endangered
	Prototroctes maraena	EPBC Act, Vic FFG Act	Vulnerable, Endangered
Mammals	*Ornithorhynchus anatinus*	Vic FFG Act	Vulnerable

Threatened aquatic species are collectively widespread across all five catchments (Figs. 16, 17). The Platypus (*Ornithorhynchus anatinus*; see also Case study 2) was detected across a particularly broad range relative to other threatened aquatic fauna (Fig. 16), which were comprised completely of fish species, with the exception of the Growling Grass Frog *Litoria raniformis*.

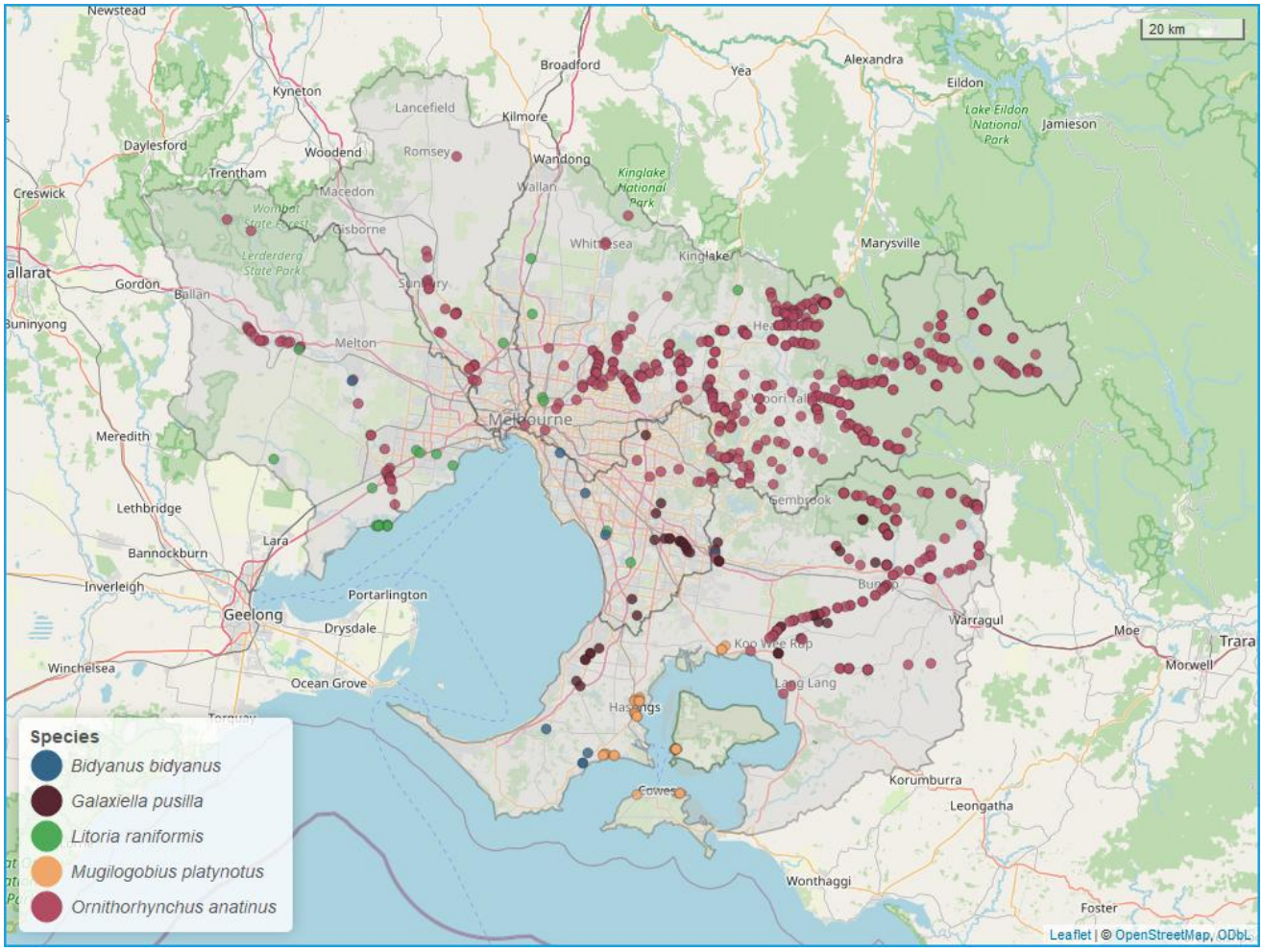

Fig. 16. Detections of five threatened aquatic species (n=10 threatened species total; see Fig. 17). Results include species listed under the EPBC Act and/or VIC FFG Act Advisory Lists.

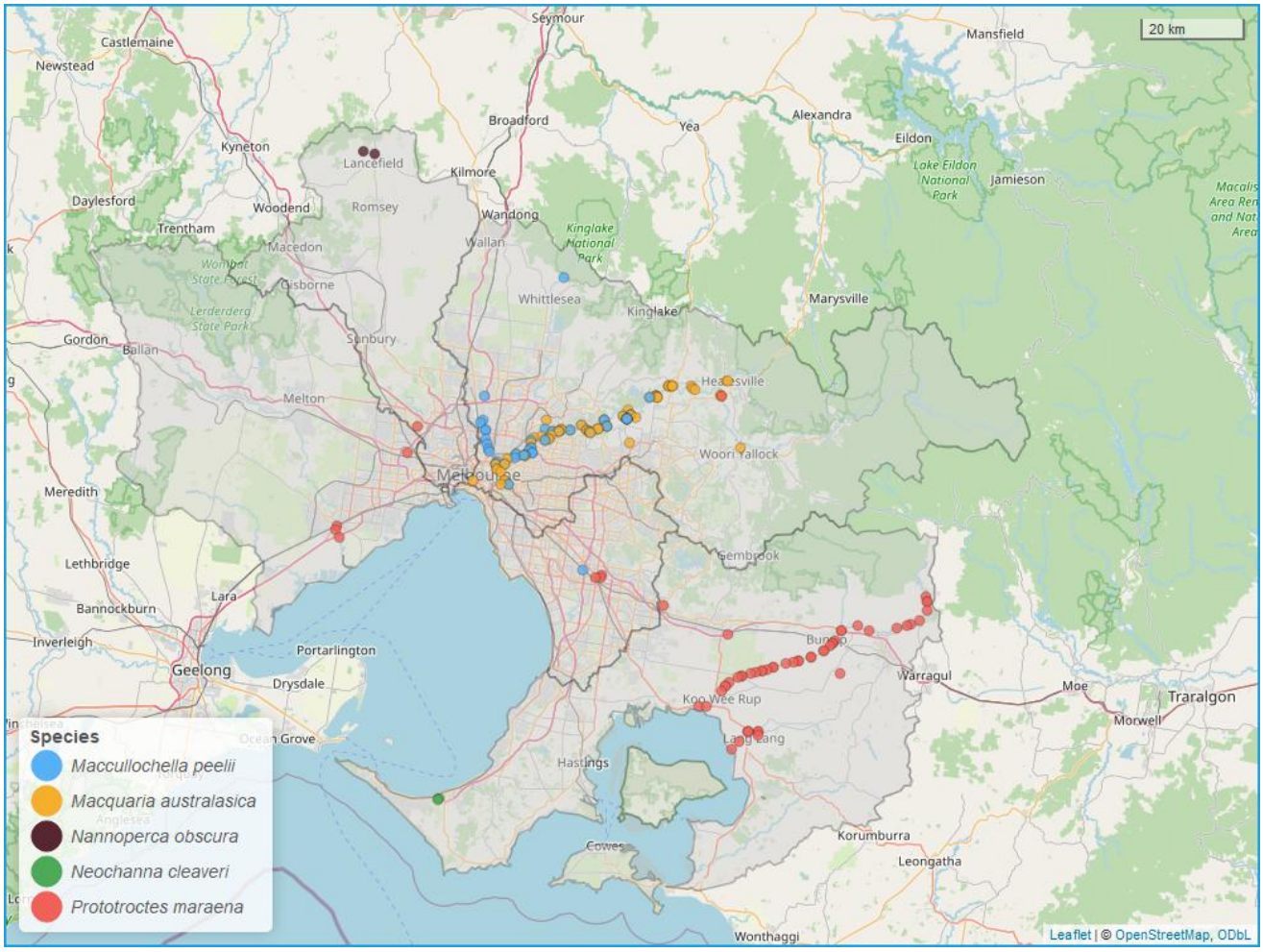

Fig. 17. Detections of five threatened aquatic species (n=10 threatened species total; see Fig. 16). Results include species listed under the EPBC Act and/or VIC FFG Act Advisory Lists.

Case study

Platypus

Image: Doug Gimesy

EnviroDNA

Melbourne Water

Case study 2: Platypus (*Ornithorhynchus anatinus*)

The Platypus is a monotreme species that is listed as Vulnerable in Victoria. Substantial effort has been invested in monitoring populations of this species using fyke-net trapping, revealing important insights regarding its ecology, demography, genetics, and decline in some catchments. Research has demonstrated that trapping may be suboptimal, however, for assessing distribution change across a broad spatial extent (Lugg et al., 2018). eDNA sampling using metabarcoding and/or qPCR holds much promise in this regard (Lugg et al., 2018).

Because of the importance of this iconic species, and because qPCR can be more sensitive than metabarcoding for some species (McColl-Gausden et al., 2023), the Platypus was the only species for which qPCR and a species-specific primer/probe were used to screen water samples. Overall, 3,889 samples from 3,531 sites were screened for platypuses (when treating each combination of site and season as a separate site). Platypus eDNA was detected in 799 samples, collected from 514 occupied sites (Fig. 18). The overall distribution of the Platypus ascertained from metabarcoding samples with a vertebrate assay (Case study 1) was similar to that obtained via qPCR. Importantly, Platypus eDNA was detected (>= 2 technical replicates) in 34 subcatchments, and historical Platypus records were absent from 13 of these subcatchments (see Table A70 in the Appendix for a list of occupied subcatcments). Platypus eDNA was not detected in 3 subcatchments in which it had historically been recorded: Deep Creek Upper, Plenty River (Source) and Diamond Creek (Source). The eDNA method has crucially established a new baseline for platypuses across all of Melbourne's subcatchments.

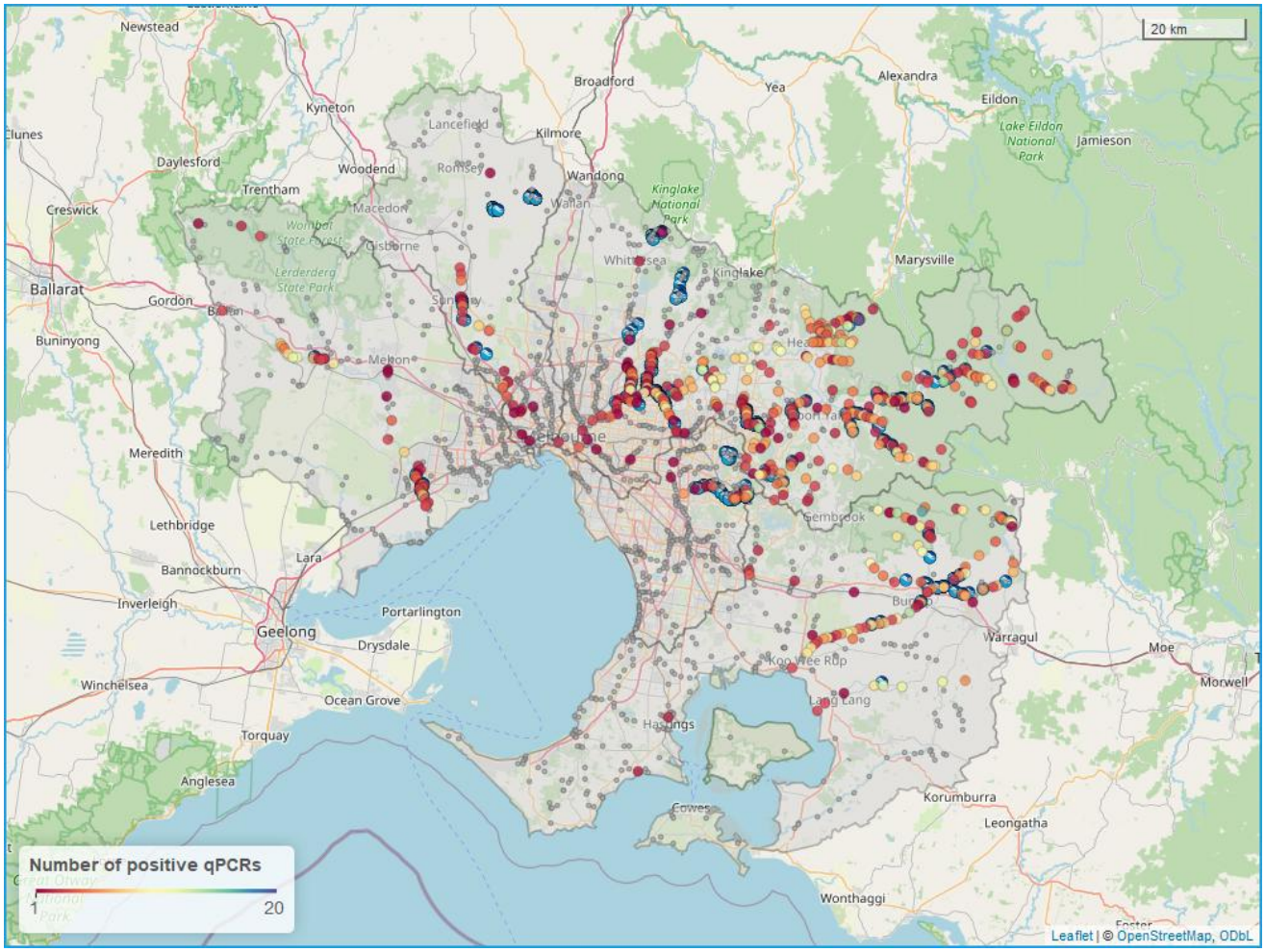

Fig. 18. Distribution of Platypus (*Ornithorhynchus anatinus*) across survey seasons, as determined by qPCR of eDNA samples. Grey points represent sites where qPCR did not amplify Platypus eDNA; blue Melbourne Water symbols represent historic Melbourne Water detections.

Of the 799 samples which contained Platypus eDNA, 412 samples were unequivocally positive (i.e. >= two positive technical replicates; Fig. 19).

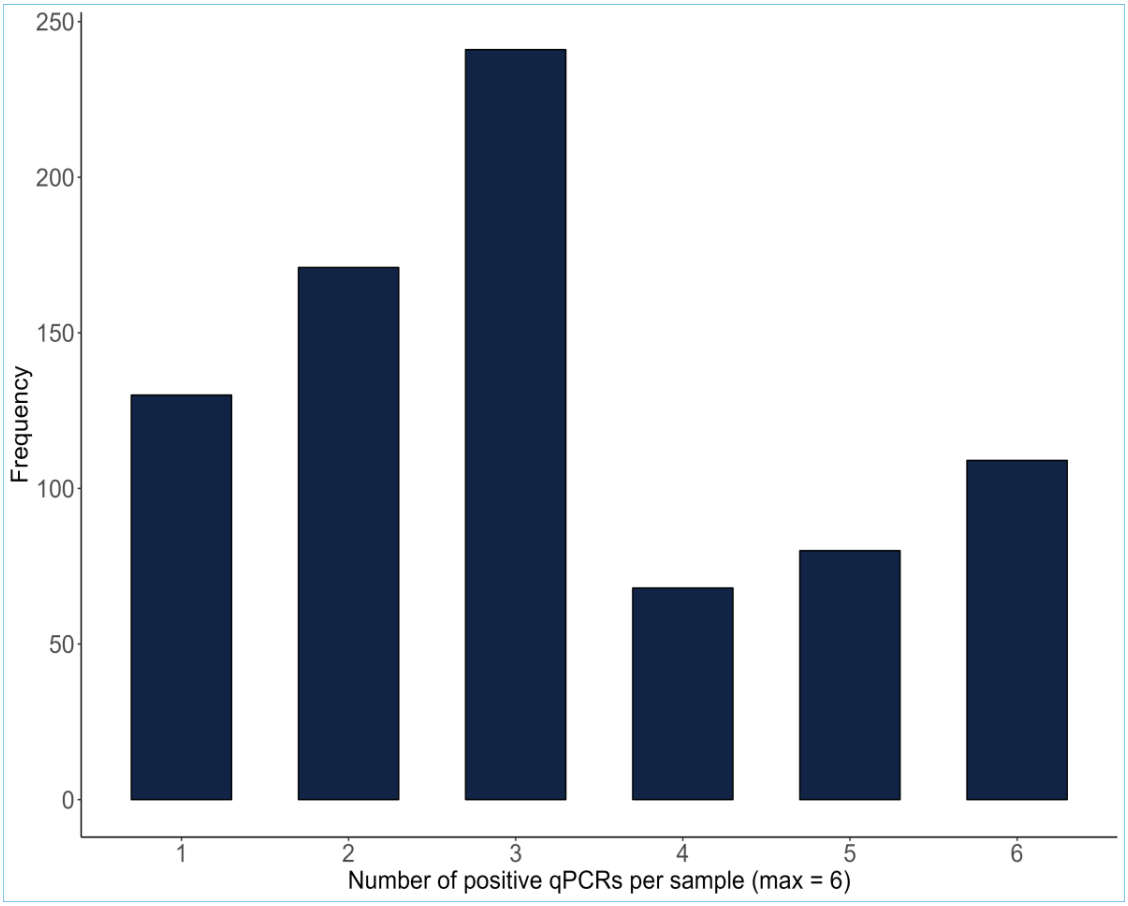

Fig. 19. Distribution of the number of technical qPCR replicates that successfully amplified Platypus eDNA across all collected samples. The maximum possible value is six, because each half of a filter was processed separately, and three technical replicates were used from each filter half.

Case study

Flatback Mangrove Goby

Image: Carl Struthers

EnviroDNA

Melbourne Water

Case study 3: Pale mangrove goby (*Mugilogobius platynotus*)

The Pale mangrove goby is an estuarine species that is endemic to southern Australia (SA, VIC, and southern QLD). It is listed as Endangered in Victoria (Table 9), and thus novel detections of this species are of particular conservation interest.

Pale mangrove goby eDNA was detected in all five seasons and at 19 unique locations in the Westernport catchment, including sites within the Mornington Peninsula North-Eastern Creeks, French and Phillip Islands, Mornington Peninsula South-Eastern Creeks and Dalmore Outfalls subcatchments (Fig. 20). These detections represent significant expansion of the species' previously-estimated range. Indeed, Pale mangrove goby had only been previously detected in 2 of these subcatchments (Table 7). Further eDNA work could be undertaken to completely delimit the species range throughout the Westernport catchment.

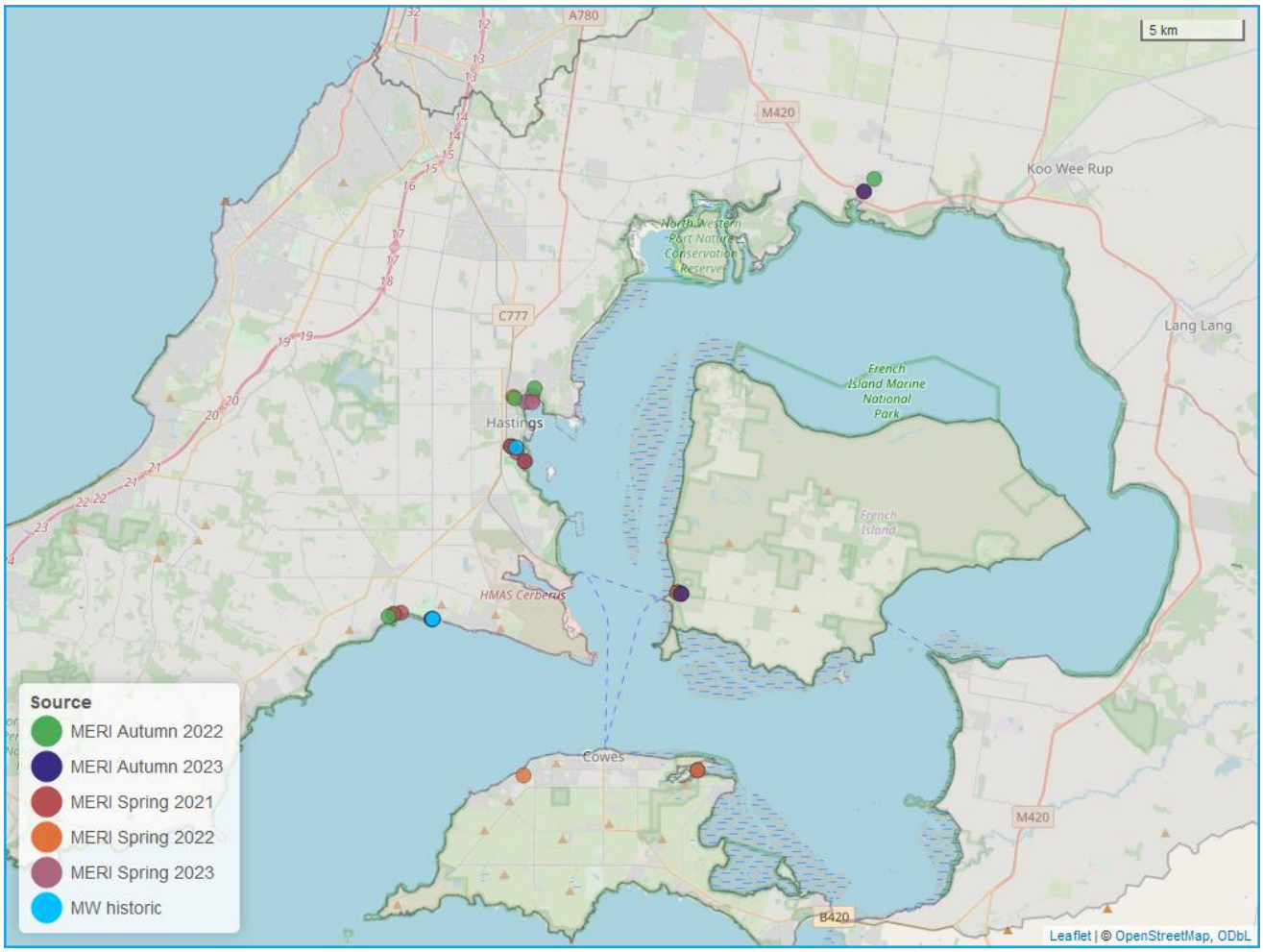

Fig. 20. Distribution of Pale mangrove goby (*Mugilogobius platynotus*), across survey seasons. Historic Melbourne Water detections are shown for reference.

Case study

Australian mudfish

Image: gfnc.org.au

EnviroDNA

Melbourne Water

Case study 4: Australian mudfish (*Neochanna cleaveri*)

The Australian mudfish is a small Galaxiid species that is endemic to Victoria, Tasmania, and South Australia. In Victoria, it is known from few locations, and is listed as Endangered (Table 9).

Interestingly, this species' eDNA was detected at 2 spatially-distinct locations in the Mornington Peninsula Western Creeks subcatchment in Chinamans Creek (Fig. 21). This species has not previously been detected in this creek, nor has it been recently detected in waterways that flow into Port Phillip Bay (historical records exist in the Yarra River and in Steele Creek, Maribyrnong, however). While there are recent detections of Australian mudfish in Bunyip River (Arthur Rylah Institute, pers. comm.), the eDNA detections shown in Fig. 21 represent significant new detections for the species, particularly considering its Endangered status in Victoria. What's more, eDNA of the Australian mudfish was detected in Spring 2021 at one site, and in Autumn 2023 at the second site. Initial attempts to verify these records with dip netting and electrofishing were unsuccessful (Rhys Coleman, pers. comm.), but further work should target this waterway to determine more accurately the distribution of the mudfish population in Chinamans Creek.

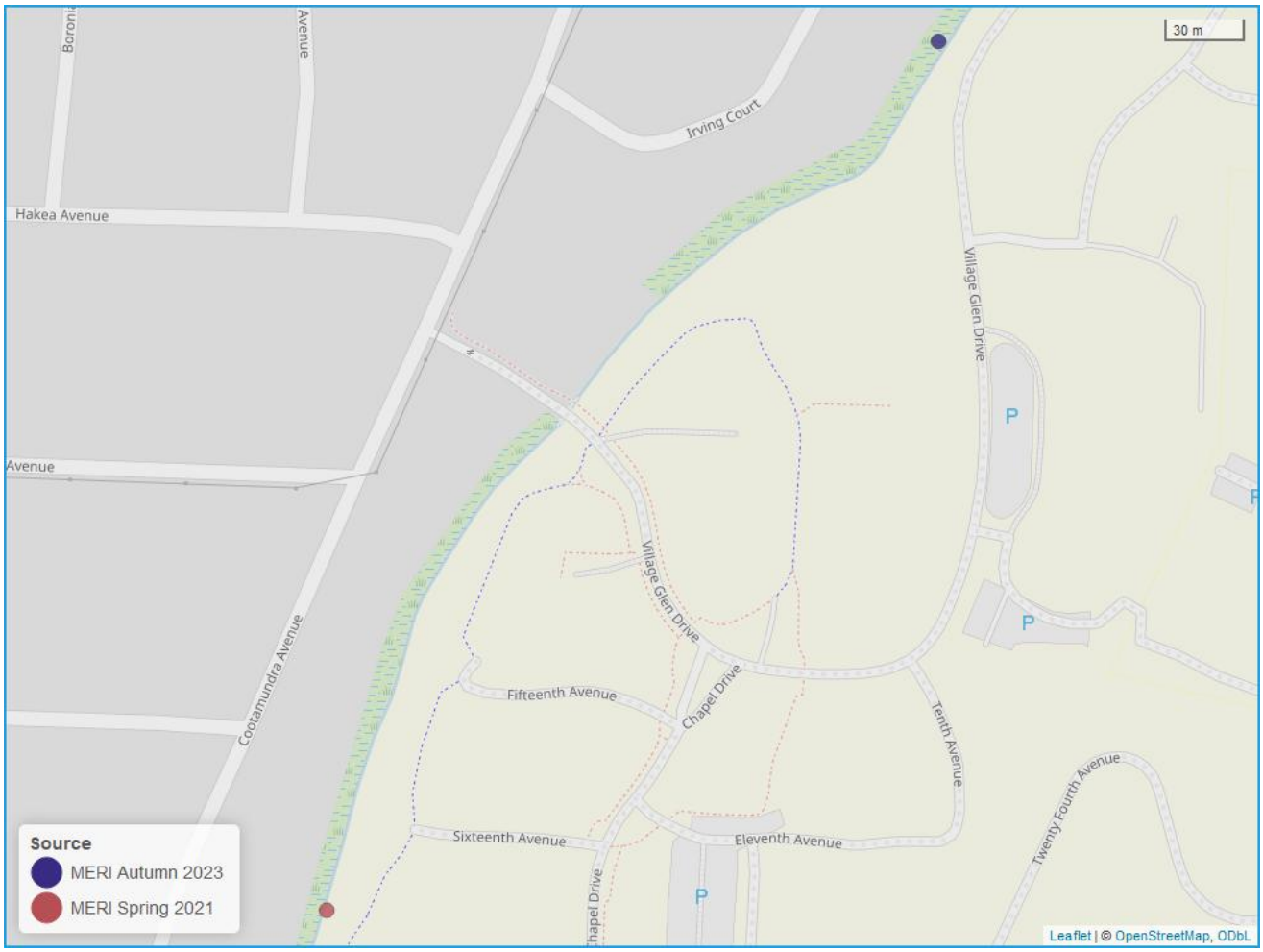

Fig. 21. Distribution of Australian mudfish (*Neochanna cleaveri*), across survey seasons.

Case study

Australian grayling

Image: Tarmo A. Raadik

EnviroDNA

Melbourne Water

2020-2024
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Case study 5: Australian grayling (*Prototroctes maraena*)

The Australian grayling primarily occupies freshwater habitats and is endemic to Victoria, Tasmania, and New South Wales. It is listed as Endangered in Victoria, and as Vulnerable at the federal level (Table 9).

Despite the species' threatened status, Australian grayling eDNA was detected in 4 of five survey seasons at 50 unique sites. The only season in which Australian grayling eDNA was not detected was Spring 2023, when few samples were collected, and wetlands and estuaries were targeted. Occupied sites span all five catchments and 11 subcatchments, including 5 new subcatchments lacking historic Melbourne Water observations (Fig. 22; Table 7).

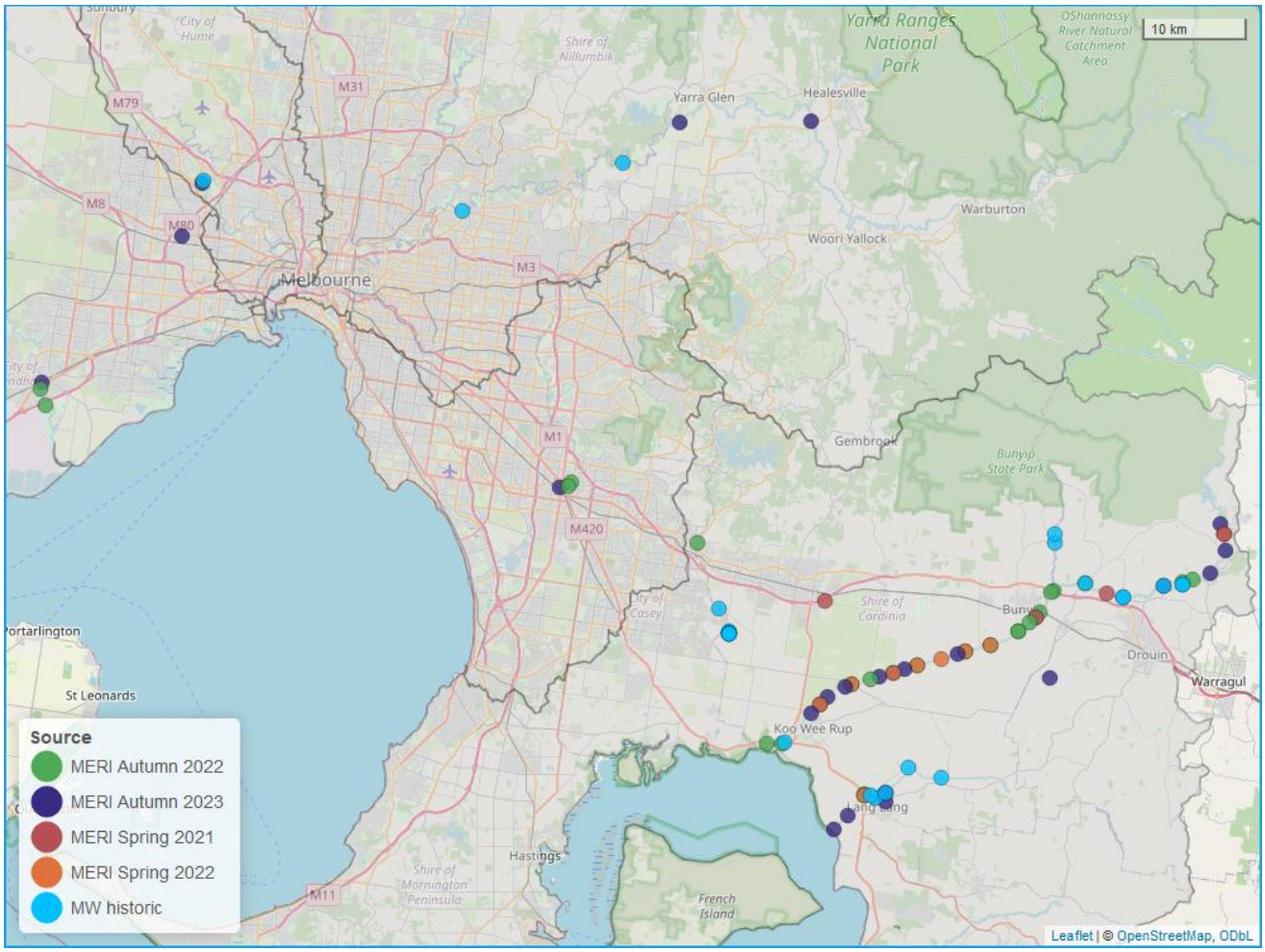

Fig. 22. Distribution of the threatened Australian grayling (*Prototroctes maraena*) across survey seasons. Historic Melbourne Water detections are shown for reference.

Detections

Terrestrial Taxa

EnviroDNA

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Detections of terrestrial taxa

One of the benefits of aquatic eDNA sampling is that it can also sporadically detect terrestrial taxa due to sources such as run-off, direct contact between organisms and water sources, and predator defecation.

Terrestrial taxa (comprising the taxonomic classes Aves, Reptilia, and Mammalia, excluding the Platypus) were frequently detected across all five catchments in the MERI eDNA program (Fig. 23).

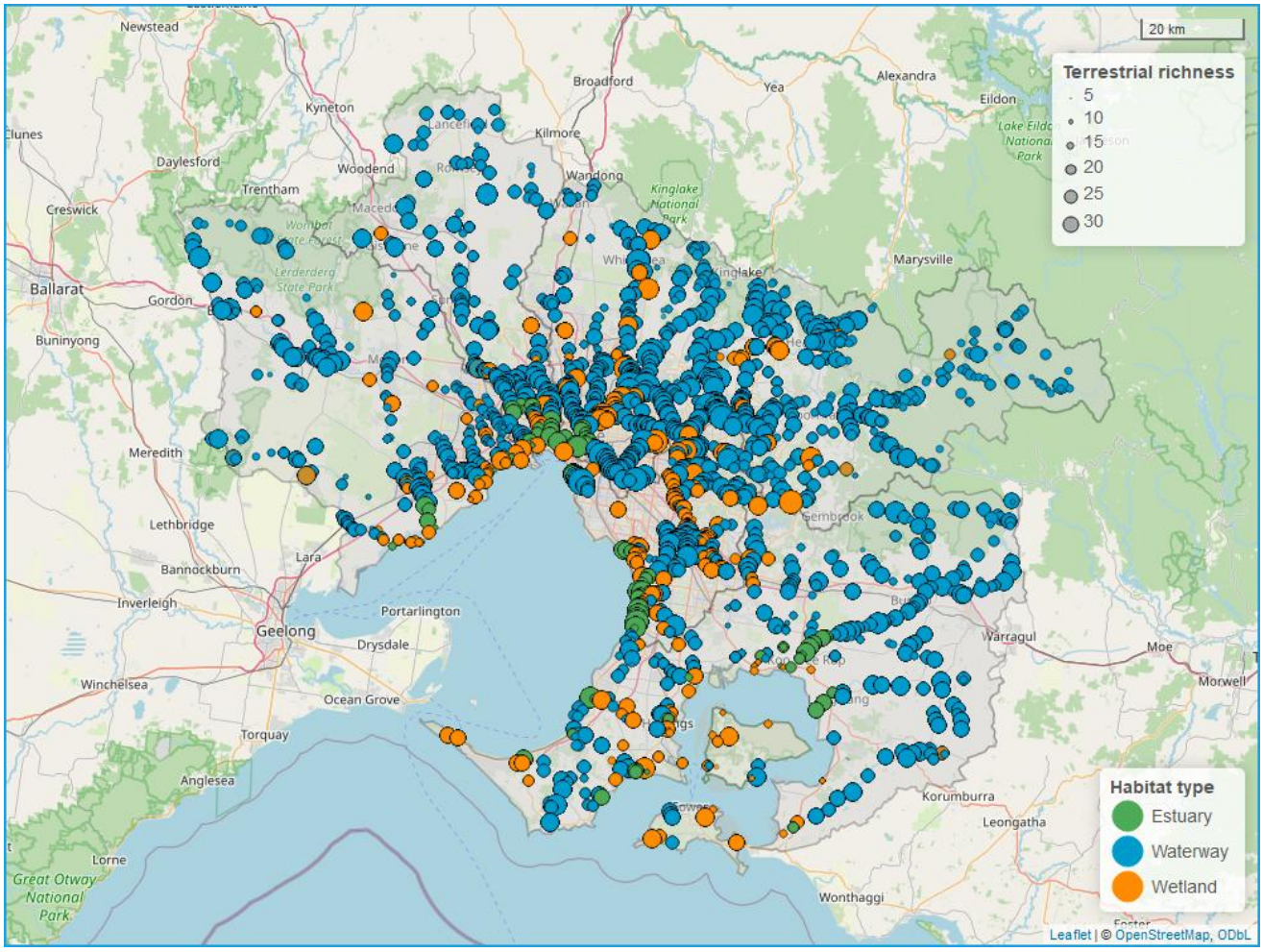

Fig. 23. Number of native terrestrial taxa detected at each site, across survey seasons. Only sites in which one or more taxa were detected are shown.

In fact, terrestrial taxa were over-represented among all eDNA detections, both in terms of species richness (232 taxa, 65.7% of the total number of taxa detected), and number of detections (32,733 detections, 59.7% of all detections). Birds were the most common terrestrial group (147 taxa), followed by mammals (69), and reptiles (16). However, this pattern is perhaps unsurprising, given avian diversity relative to that of other groups.

Future work could usefully investigate the extent to which aquatic detections of terrestrial taxa, such as mammals, reptiles, and birds, align with or complement distribution data from additional sources, such as records from the Victorian Biodiversity Atlas or the Atlas of Living Australia. Similarly, the data presented here could be used to explore whether semi-aquatic taxa, such as wetland birds, could be efficiently surveyed via eDNA sampling as part of the MERI program. One might expect to detect a correlation between the extent to which a species utilises the aquatic environment and the sensitivity of aquatic eDNA sampling. Finally, a greater understanding of the

impacts of rainfall (as a proxy for run-off) on aquatic detections of terrestrial taxa may provide further insight into temporal variation in detections, and thus shed light on the reliability of aquatic eDNA sampling for terrestrial taxa.

Case study

Threatened species

EnviroDNA

Melbourne Water

Case study 6: Threatened terrestrial species

Eighteen terrestrial species were listed under the EPBC Act and/or VIC FFG Act Advisory Lists (Table 10), including 8 bird, 8 mammal, and 2 reptile species.

Table 10. Threatened terrestrial taxa detected in the MERI eDNA program.

Group	Taxonomy	Common name	List	Status
Birds	*Aphelocephala leucopsis*	Southern whiteface	EPBC Act	Vulnerable
	Ardea intermedia	Intermediate egret	Vic FFG Act	Critically Endangered
	Biziura lobata	Musk duck	Vic FFG Act	Vulnerable
	Cereopsis novaehollandiae	Cape barren goose	EPBC Act	Vulnerable
	Charadrius mongolus	Lesser sand plover	EPBC Act, Vic FFG Act	Endangered, Endangered
	Lewinia pectoralis	Lewin's rail	Vic FFG Act	Vulnerable
	Oxyura australis	Blue-billed duck	Vic FFG Act	Vulnerable
	Pycnoptilus floccosus	Pilotbird	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Mammals	*Isoodon obesulus*	Southern brown bandicoot	EPBC Act, Vic FFG Act	Endangered, Endangered
	Mastacomys fuscus	Broad-toothed rat	EPBC Act, Vic FFG Act	Endangered, Vulnerable
	Perameles gunnii	Eastern barred bandicoot	EPBC Act, Vic FFG Act	Endangered, Endangered
	Petauroides volans	Greater glider	EPBC Act, Vic FFG Act	Endangered, Endangered
	Petaurus australis	Yellow-bellied glider	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
	Phascogale tapoatafa	Brush-tailed phascogale	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
	Potorous tridactylus	Long-nosed potoroo	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
	Pteropus poliocephalus	Grey-headed flying fox	EPBC Act, Vic FFG Act	Vulnerable, Vulnerable
Reptiles	*Emydura macquarii*	Southern river turtles	Vic FFG Act	Critically Endangered
	Tiliqua scincoides	Eastern blue-tongue lizard	EPBC Act	Critically Endangered

Threatened birds, mammals and reptiles were detected across 61 of 69 subcatchments, and in all five catchments. Fig. 24, below, shows detections of threatened birds, whereas Fig. 25 illustrates detections of threatened mammals (excluding the Platypus).

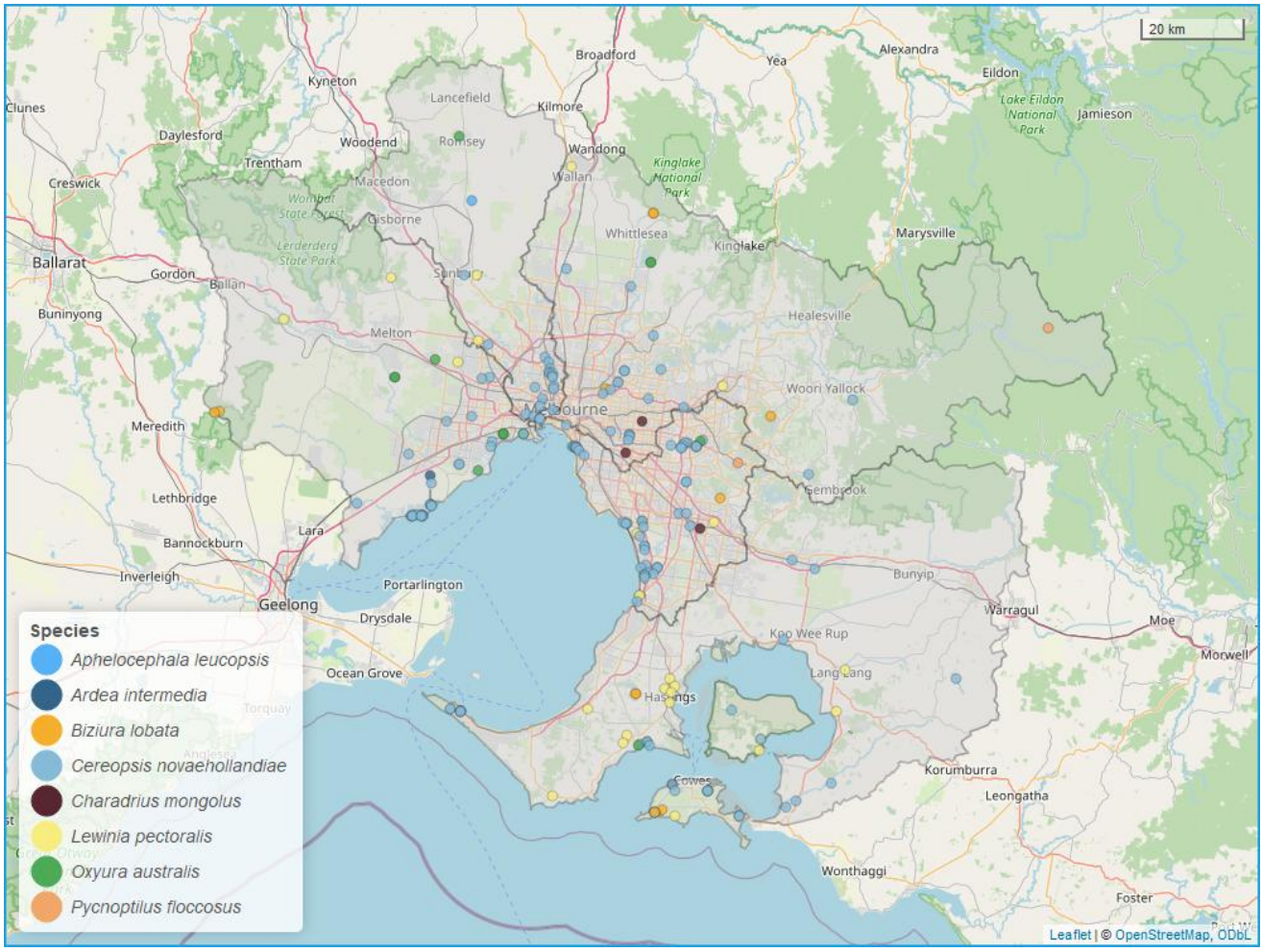

Fig. 24. Distributions of threatened bird species detected via eDNA sampling. Results include species listed under the EPBC Act and/or VIC FFG Act Advisory Lists. Only sites in which one or more target taxa were detected are shown.

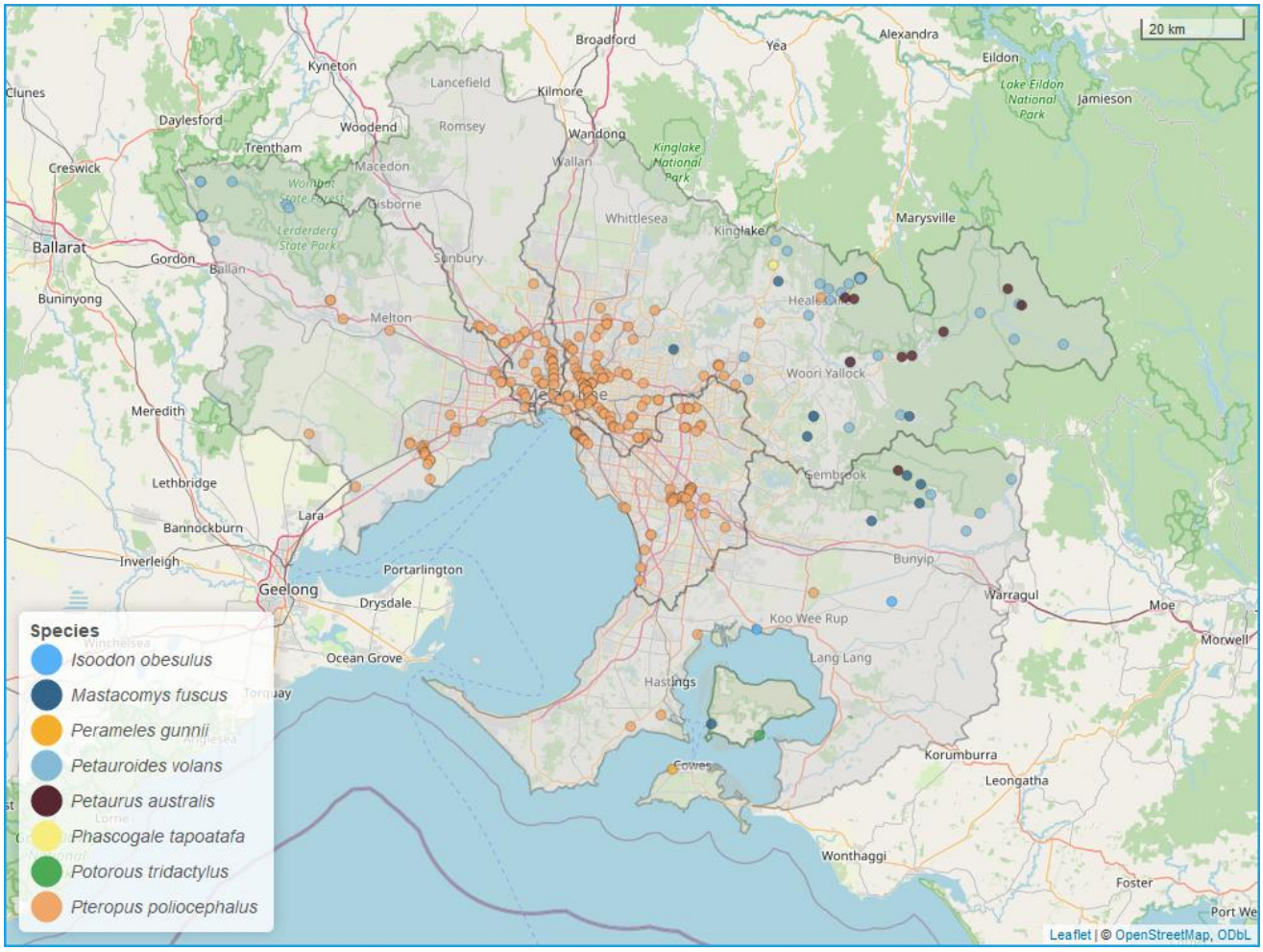

Fig. 25. Distributions of threatened mammal species detected via eDNA sampling (excluding the Platypus; see Case studies 1 & 2). Results include species listed under the EPBC Act and/or VIC FFG Act Advisory Lists. Only sites in which one or more target taxa were detected are shown.

Case study:

Feral deer

EnviroDNA

Melbourne Water

Case study 7: Feral deer

Environmental DNA is particularly useful for detecting invasive species, which can occur at high densities both in (aquatic) and around (terrestrial) waterways. Feral deer, in particular, were detected via eDNA sampling in 56 of 69 subcatchments, highlighting their broad distribution and potential impact on Melbourne's waterways (and particularly upper catchment regions). Three deer species were detected: *Cervus elaphus* (Red deer), *Dama dama* (Fallow deer) and *Rusa unicolor* (Sambar deer). *Rusa unicolor* was by far the most commonly detected deer species, comprising 82.8% of all deer detections. Fig. 26 illustrates this finding spatially, demonstrating the broad geographic extent over which *Rusa unicolor* was detected, although most detections appear in upper catchment areas of the Yarra and Westernport catchments. Only 0.3% of all deer detections could not be resolved to species level (labelled 'Cervidae' in Fig. 26).

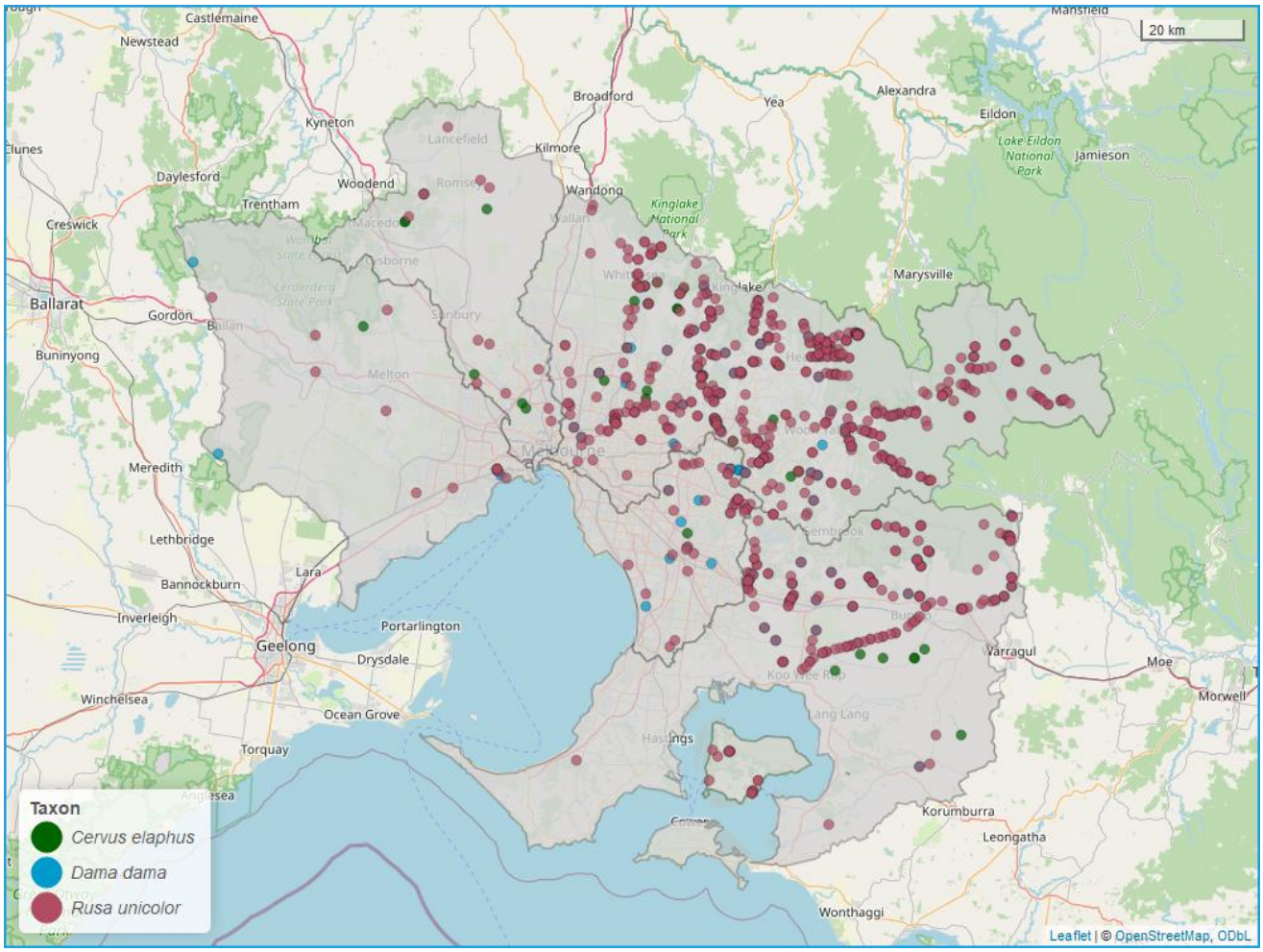

Fig. 26. Distributions of feral deer taxa detected via eDNA sampling.

Discussion

Discussion

The MERI eDNA program is unprecedented in its spatial and temporal coverage, as well as its taxonomic breadth. The rapid and comprehensive nature of eDNA sampling enabled all 69 subcatchments within the Melbourne Water Region to be sampled on multiple occasions in both Autumn and Spring across multiple years. Furthermore, the program was able to survey a diverse range of target taxa - including fish, amphibians, mammals, and reptiles - by using two assays targeting vertebrates and amphibians. Finally, the versatility of eDNA sampling enabled biodiversity data to be collected in diverse habitats, including waterways, estuaries, and wetlands. Collectively, these features of the MERI eDNA program make it unique not only among eDNA-based monitoring programs, but among biodiversity monitoring programs more broadly, both nationally and internationally.

Key findings

Below we summarise some of the key initial findings and opportunities of the MERI eDNA program:

eDNA data is congruent with, but also enhances, existing biodiversity monitoring efforts

Our comparison of fish and frog detections via eDNA sampling with historic detection data from Melbourne Water demonstrate that eDNA sampling captured similar coarse geographic trends. Indeed, the number of subcatchments occupied by a species was highly congruent between datasets, with correlations of 0.90 for fish and 0.98 for frogs. However, more detailed investigations (Tables 7 & 8; Case study sections) reveal many instances in which the MERI eDNA program has expanded the previously-known distributions of species. Nearly all fish and amphibian species were detected in one or more new subcatchments. The same pattern was seen with platypuses, which were detected in 13 new subcatchments. This finding alone is significant, given the iconic status of the Platypus and the substantial resources that have been invested into understanding its biology and distribution. The number of new detections reported here would be even higher for most taxa when viewed at a finer spatial resolution than the subcatchment scale employed in this report (e.g., new waterways, wetlands, or smaller administrative areas).

Thus, eDNA sampling provides data that both complements and expands traditional monitoring efforts, but at reduced cost and in many cases, with higher sensitivity. Another major advantage is the short timescale over which this data is collected, which enables more real-time monitoring of distribution changes. However, users of eDNA data should be aware that this increased sensitivity can occasionally lead to the detection of species in the absence of sustainable wild populations. For example, Barramundi *Lates calcarifer*, a popular recreational fish with a tropical distribution, was detected in several areas, including the Dandenong Creek Middle and Maribyrnong River subcatchments. Such detections potentially reflect the presence of released individuals, but do not indicate a breeding population. Similarly, mobile predators that move between aquatic systems (e.g., birds) can introduce eDNA of their prey into areas where prey species do not naturally occur.

eDNA data provides a useful tool for broad surveillance and threat detection

The MERI eDNA program detected 7 aquatic species listed under the EPBC Act. At the State level, 10 aquatic species listed under the VIC FFG Act Advisory Lists were detected. Of particular note are new detections of threatened, localised species, such as the Pale mangrove goby (see Case study 3) and the Australian mudfish (Case study 4). Threatened species detections such as these can be used to prioritise additional surveys, habitat restoration efforts, and other management activities.

Similarly, the MERI eDNA program detected 15 aquatic, non-native species, such as Common carp, Brown trout, and Gold fish. A better understanding of the distributions of non-native species can inform suppression and/or eradication efforts aimed at protecting native biodiversity.

Combining information on detections of threatened and non-native species may shed further light on management and biodiversity priorities.

Aquatic eDNA sampling can provide insight into terrestrial biodiversity patterns

Two hundred thirty-two terrestrial taxa were detected via eDNA sampling, including 13 terrestrial species listed under the EPBC Act and 15 on the VIC FFG Act Advisory Lists. In addition, 26 terrestrial, non-native species, including the Red fox, Black rat, Common starling, and three deer species, were detected throughout all five catchments.

Importantly, eDNA sampling detected taxa from all three terrestrial vertebrate Classes (birds, mammals, reptiles) from diverse habitat types, demonstrating the taxonomic breadth and sampling versatility that eDNA sampling can achieve. Birds were the most commonly detected terrestrial taxa, likely reflecting their high abundance and diversity relative to other terrestrial groups. Further inflating the number of bird detections is our crude categorisation of all birds as terrestrial. This is clearly an oversimplification, especially considering that the eDNA of waterfowl taxa was commonly detected. Nonetheless, truly terrestrial birds routinely comprise a substantial portion of detections in aquatic eDNA studies.

In contrast, reptile detections were comparatively rare, comprising 6.9% off all terrestrial detections. Some reptile taxa, such as lizards, can achieve high densities around waterways, while some turtles spend significant amounts of time in wetlands and waterways. As such, one might expect more frequent reptile detections. However, consistent detection of reptilian taxa has been difficult to achieve in many aquatic eDNA studies, and thus it is unsurprising that reptiles comprised <10% of all terrestrial detections. Future studies could explore the extent to which terrestrial eDNA sampling is more sensitive than aquatic sampling.

eDNA sampling provides biobanking opportunities for future analyses

DNA extracted from site samples that have been collected from 2021-2023 have all been stored at -80 °C. These samples can be used as a resource for detecting other taxa using different assays. For instance, we have recently screened a subset of samples from Spring 2022 for the threatened freshwater mussel (*Hyridella narracanensis*) using a qPCR assay, as well as decapods using a decapod metabarcoding assay, to provide further insight into their distributions for Melbourne Water. Similarly, we are trialing assays that target invertebrates to assess eDNA sampling and detection methods as a tool for monitoring macroinvertebrates (another key value under the HWS). These are but a small number of examples of the vast potential of biobanked samples provided by the MERI eDNA program that can be used to either generate new biodiversity data on other taxa, or to develop and refine methods to help improve sensitivity and the efficiency of detections for future eDNA surveys that contribute to the MERI program or other Melbourne Water initiatives.

Recommendations

We close with three recommendations for how the MERI eDNA program could potentially be improved for the next phase of the program:

Conduct a formal statistical analysis to evaluate the current sampling design

The sampling design of the MERI eDNA program was informed by the best available data and modelling approaches at the time. However, without adequate baseline data on species' distributions and detectability, many assumptions had to be made. The data presented here now provide an opportunity to revisit the sampling design of the MERI eDNA program, and refine the sampling approach, where relevant. This work is currently underway (Tingley, Hale & Weeks, in prep.), and will provide more insight into the power achieved with the current sampling program.

Evaluate the efficacy of a multi-assay eDNA approach

The MERI eDNA program used a single vertebrate assay for waterways and estuaries, whereas wetland samples were supplemented with an amphibian-specific amplicon. The vertebrate amplicon is attractive because it can adequately resolve most vertebrate taxa, but its sensitivity can be reduced when samples contain high DNA concentrations of individual taxa or groups.

Recent advances in eDNA methods provide an opportunity to deploy multi-amplicon approaches, which involve using multiple *complementary* eDNA assays on each water sample that target different genetic barcode regions (amplicons) of target groups. This approach has the potential to radically increase the sensitivity of eDNA sampling, and thus the power to detect biodiversity change, and also to lower the per-species cost of detection through gains in processing efficiency. Multiple eDNA assays also average over biases that can be apparent when using amplicon metabarcoding methods, providing increased sensitivity for detecting taxa, and improving resolution of detections. Furthermore, a multi-assay approach can enable monitoring of other key groups, such as decapods, freshwater mussels, and macroinvertebrates.

Future work could usefully assess the sensitivity and cost-efficiency of the multi-assay approach by revisiting a subset of the 69 subcatchments that were well-sampled during the MERI program, and screening samples with multiple amplicons targeting key taxonomic groups.

Similarly, other indicator taxa could also be explored. For instance, including microorganisms and other taxa (e.g., bacteria, diatoms, fungi, plants, protists, etc.) in a multi-assay approach could provide new methods for investigating links between waterway health and functional groups, and determining the stressors that affect biodiversity in waterways.

Use MERI data to develop an interactive Report Card system for tracking biodiversity change

EnviroDNA has created interactive web applications to visualise, query, and download MERI eDNA data (http://envirodna.dmrose.net/; envirodna.shinyapps.io/MW_2021-2023/). To improve the transparency, simplicity, repeatability, and rigour of the MERI program, and to capitalise on complementary biodiversity and environmental datasets (e.g., macroinvertebrate surveys, water quality), further work could usefully develop a spatial dashboard that generates biodiversity insights across each of Melbourne Water's 69 subcatchments. Ideally, biodiversity change would be measured using a range of integrative metrics that span different biodiversity facets (guided by a literature review), and would be summarised across waterways, estuaries, and wetlands within each subcatchment. Combining these data types and metrics would enable the development of a biodiversity Report Card for each subcatchment that can be tracked through time.

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Appendix A: Subcatchment-level patterns

Bass River

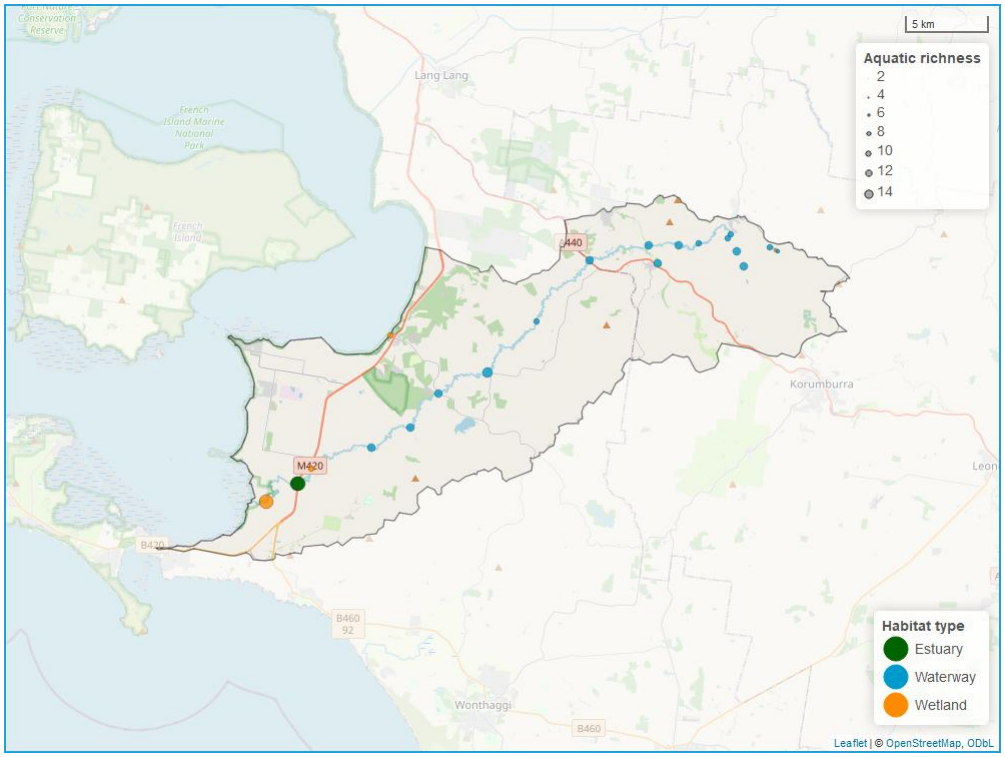

Fig. A1. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 57 samples were collected from 23 sites (Fig. A1)
- 92 aquatic taxa were detected (677 total detections), including 18 non-native species

Detections

Table A1. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Girella tricuspidata* (Luderick)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Haletta semifasciata* (Blue weed whiting)
Litoria ewingii OR Litoria verreauxii	*Hyperlophus vittatus* (Sandy sprats)
Acanthopagrus butcheri (Black bream)	*Liza argentea* (Goldspot mullet)
Afurcagobius tamarensis (Tamar goby)	*Macquaria ambigua* (Golden perch)
Aldrichetta forsteri (Yelloweye mullet)	*Macquaria colonorum* (Estuary perch)
Anguilla australis (Short finned eel)	*Nannoperca australis* (Southern pygmy perch)
Arenigobius bifrenatus (Bridled goby)	*Perca fluviatilis* (Redfin perch)
Arenigobius frenatus (Halfbridled goby)	*Philypnodon grandiceps* (Flathead gudgeon)
Atherinosoma microstoma (Small-mouth hardyhead)	*Pseudaphritis urvillii* (Tupong)
Carassius auratus (Gold fish)	*Pseudogobius olorum* (Bluespot goby)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Decapterus sp	*Rhombosolea tapirina* (Greenback flounder)
Galaxias brevipinnis (Climbing galaxias)	*Rhynchobatus sp*
Galaxias maculatus (Common galaxias)	*Tasmanogobius lasti* (Scary's tasmangoby)
Galaxias truttaceus (Spotted galaxias)	*Tetractenos glaber* (Smooth toadfish)
Gambusia holbrooki (Mosquito fish)	

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Bayside

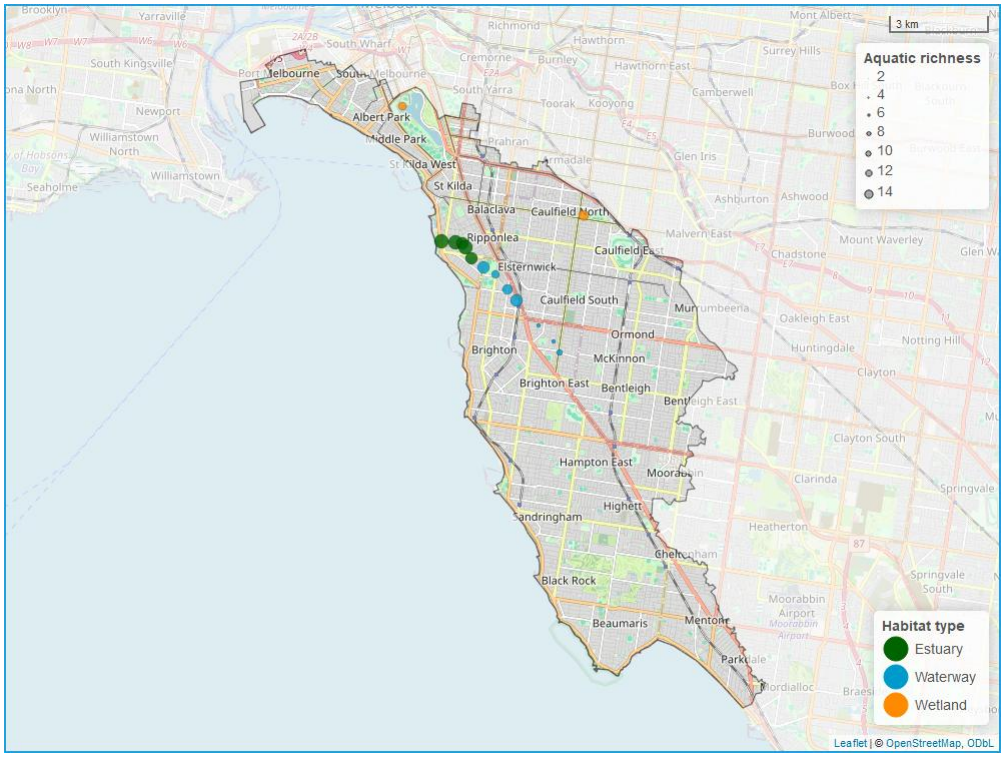

Fig. A2. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 49 samples were collected from 18 sites (Fig. A2)
- 112 taxa were detected (774 total detections); 22 were non-native and 1 were threatened

Detections

Table A2. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias brevipinnis* (Climbing galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Galaxias maculatus* (Common galaxias)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Galaxias truttaceus* (Spotted galaxias)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Litoria ewingii OR Litoria verreauxii	*Gobiopterus semivestitus* (Glassgoby)
Litoria peronii (Peron's tree frog)	*Heteroclinus heptaeolus* (Seven-bar weedfish)
Neobatrachus sudelli (Sudell's frog (common spadefoot toad))	*Liza argentea* (Goldspot mullet)
Acanthogobius flavimanus (Yellowfin goby)	*Macquaria ambigua* (Golden perch)
Acanthopagrus butcheri (Black bream)	*Macquaria colonorum* (Estuary perch)
Afurcagobius tamarensis (Tamar goby)	*Mugil cephalus* (Sea mullet)
Aldrichetta forsteri (Yelloweye mullet)	*Oncorhynchus mykiss* (Rainbow trout)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Arenigobius bifrenatus (Bridled goby)	*Pseudaphritis urvillii* (Tupong)
Arenigobius frenatus (Halfbridled goby)	*Pseudogobius olorum* (Bluespot goby)
Atherinosoma microstoma (Small-mouth hardyhead)	*Redigobius macrostoma* (Largemouth goby)
Bidyanus bidyanus (Silver perch)	*Salmo trutta* (Brown trout)
Carassius auratus (Gold fish)	*Scobinichthys granulatus* (Rough leatherjacket)
Chrysophrys auratus (Snapper)	*Stigmatopora nigra* (Widebody pipefish)
Cyprinus carpio (Common carp)	*Tetractenos glaber* (Smooth toadfish)
Diodon sp	*Tridentiger trigonocephalus* (Trident goby)

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Blind Creek

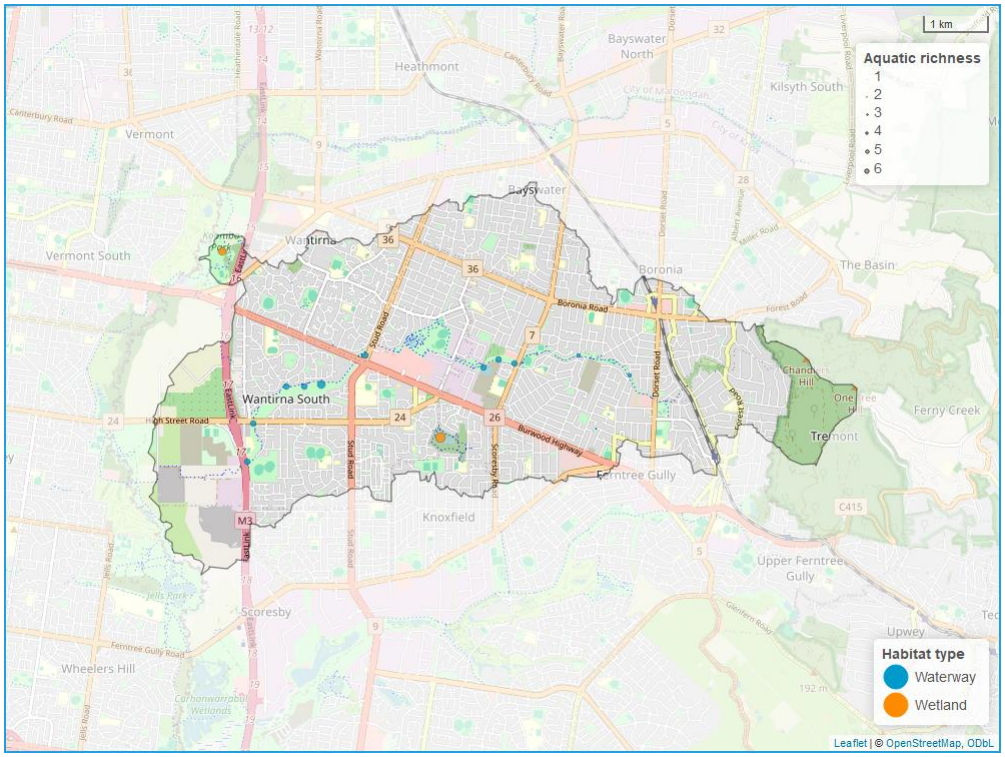

Fig. A3. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 43 samples were collected from 14 sites (Fig. A3)
- 71 aquatic taxa were detected (640 total detections), including 22 non-native species

Detections

Table A3. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias brevipinnis* (Climbing galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Galaxias maculatus* (Common galaxias)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria ewingii OR Litoria verreauxii	*Nannoperca australis* (Southern pygmy perch)
Litoria sp	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Rutilus rutilus* (Roach)
Cyprinus carpio (Common carp)	

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Boyd Creek

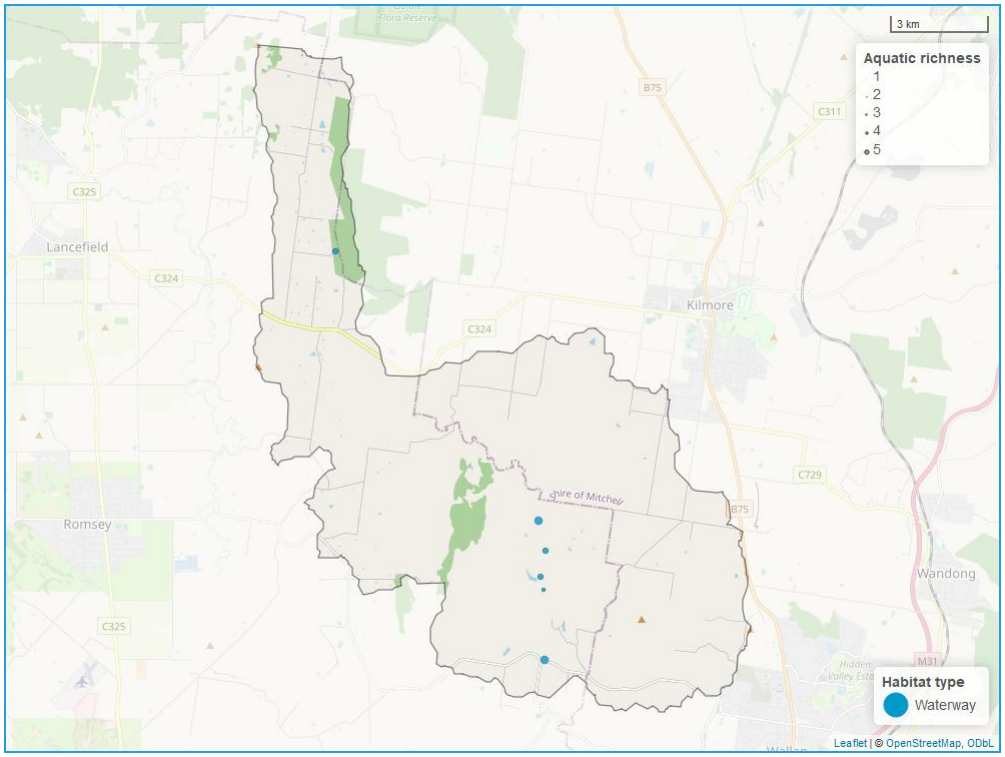

Fig. A4. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 11 samples were collected from 7 sites (Fig. A4)
- 36 aquatic taxa were detected (80 total detections), including 8 non-native species

Detections

Table A4. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Perca fluviatilis* (Redfin perch)
Limnodynastes dumerilii (Eastern banjo frog)	*Philypnodon grandiceps* (Flathead gudgeon)
Litoria ewingii OR Litoria verreauxii	*Retropinna semoni* (Australian smelt)
Anguilla australis (Short finned eel)	*Salmo sp*
Galaxias ornatus (Ornate galaxias)	*Tinca tinca* (Tench)
Nannoperca australis (Southern pygmy perch)	

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Brushy Creek

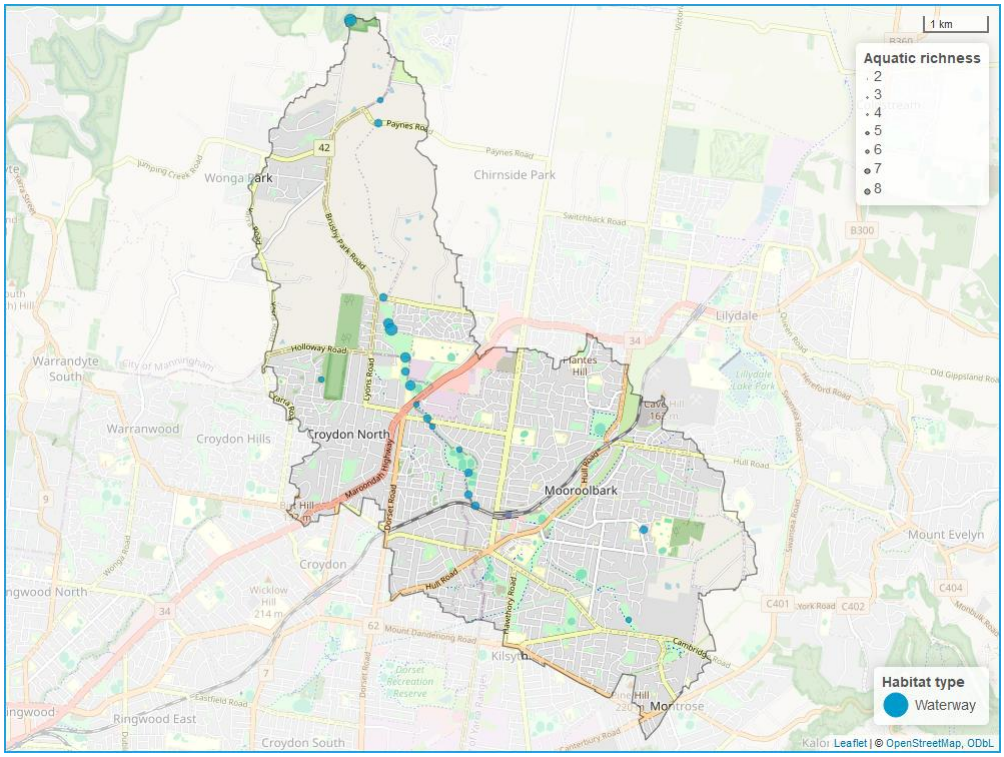

Fig. A5. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 62 samples were collected from 21 sites (Fig. A5)
- 101 taxa were detected (1,214 total detections); 28 were non-native and 2 were threatened

Detections

Table A5. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias ornatus* (Ornate galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Macquaria australasica* (Macquarie perch)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria ewingii OR Litoria verreauxii	*Nannoperca australis* (Southern pygmy perch)
Litoria peronii (Peron's tree frog)	*Oncorhynchus mykiss* (Rainbow trout)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Carassius auratus (Gold fish)	*Philypnodon grandiceps* (Flathead gudgeon)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Gadopsis marmoratus (River blackfish)	*Rutilus rutilus* (Roach)
Galaxias brevipinnis (Climbing galaxias)	*Salmo trutta* (Brown trout)
Galaxias maculatus (Common galaxias)	*Ornithorhynchus anatinus* (Platypus)

Bunyip Lower

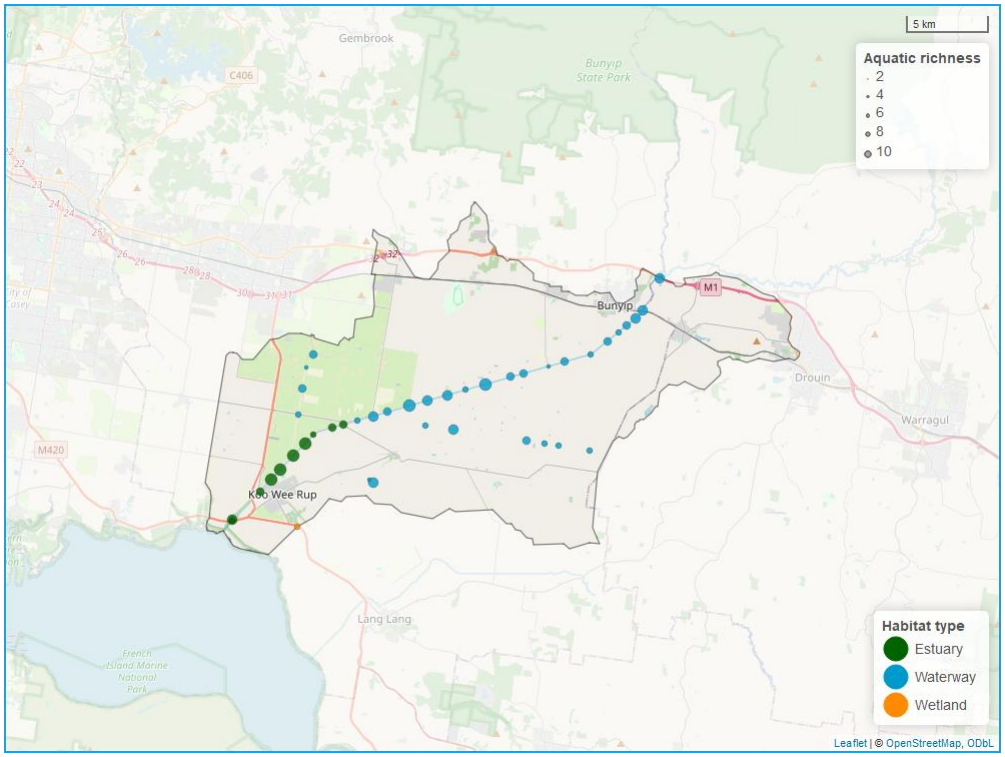

Fig. A6. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 81 samples were collected from 43 sites (Fig. A6)
- 99 taxa were detected (1,139 total detections); 23 were non-native and 3 were threatened

Detections

Table A6. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxiella pusilla* (Dwarf galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Geotria australis* (Pouched lamprey)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Hipposcarus sp*
Litoria ewingii OR Litoria verreauxii	*Hyperlophus vittatus* (Sandy sprats)
Acanthogobius flavimanus (Yellowfin goby)	*Macquaria colonorum* (Estuary perch)
Afurcagobius tamarensis (Tamar goby)	*Myliobatidae sp*
Aldrichetta forsteri (Yelloweye mullet)	*Nannoperca australis* (Southern pygmy perch)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Anguilla reinhardtii (Longfin eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Prototroctes maraena* (Australian grayling)
Chrysophrys auratus (Snapper)	*Pseudaphritis urvillii* (Tupong)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Gadopsis marmoratus (River blackfish)	*Salmo trutta* (Brown trout)
Galaxias brevipinnis (Climbing galaxias)	*Tetractenos glaber* (Smooth toadfish)
Galaxias maculatus (Common galaxias)	*Ornithorhynchus anatinus* (Platypus)
Galaxias truttaceus (Spotted galaxias)	

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Bunyip River Middle and Upper

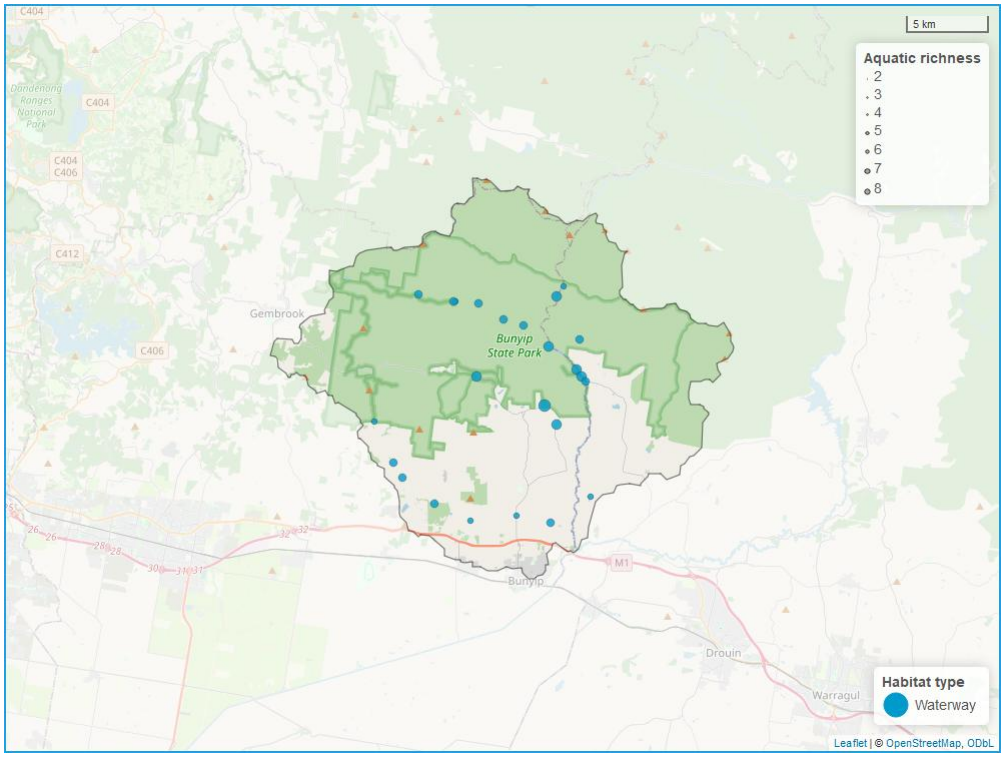

Fig. A7. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 66 samples were collected from 26 sites (Fig. A7)
- 83 taxa were detected (620 total detections); 20 were non-native and 2 were threatened

Detections

Table A7. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxiella pusilla* (Dwarf galaxias)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Nannoperca australis* (Southern pygmy perch)
Litoria ewingii OR Litoria verreauxii	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Pseudaphritis urvillii* (Tupong)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Gadopsis marmoratus (River blackfish)	*Salmo trutta* (Brown trout)
Galaxias brevipinnis (Climbing galaxias)	*Tinca tinca* (Tench)
Galaxias maculatus (Common galaxias)	*Ornithorhynchus anatinus* (Platypus)
Galaxias ornatus (Ornate galaxias)	

Cardinia, Toomuc, Deep and Ararat Creeks

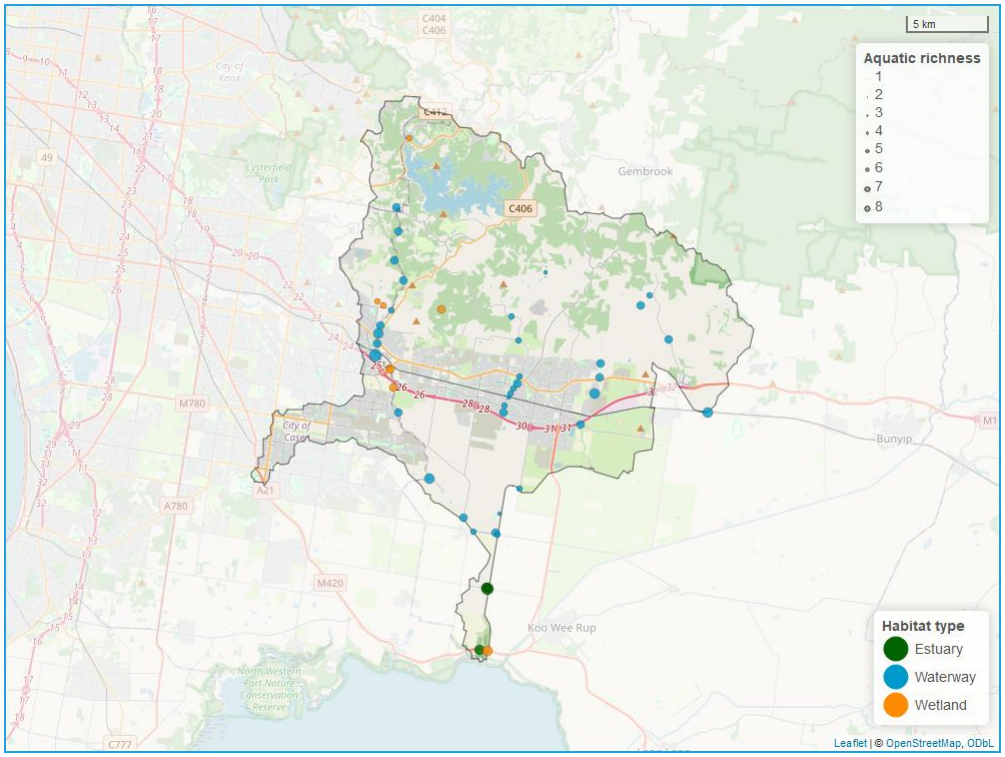

Fig. A8. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 94 samples were collected from 49 sites (Fig. A8)
- 122 taxa were detected (1,222 total detections); 28 were non-native and 4 were threatened

Detections

Table A8. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxiella pusilla* (Dwarf galaxias)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Geotria australis* (Pouched lamprey)
Litoria ewingii OR Litoria verreauxii	*Gobiopterus semivestitus* (Glassgoby)
Acanthogobius flavimanus (Yellowfin goby)	*Hypseleotris sp*
Afurcagobius tamarensis (Tamar goby)	*Macquaria colonorum* (Estuary perch)
Aldrichetta forsteri (Yelloweye mullet)	*Mugilidae sp*
Anguilla australis (Short finned eel)	*Nannoperca australis* (Southern pygmy perch)
Anguilla reinhardtii (Longfin eel)	*Oncorhynchus mykiss* (Rainbow trout)
Arenigobius frenatus (Halfbridled goby)	*Perca fluviatilis* (Redfin perch)
Atherinosoma microstoma (Small-mouth hardyhead)	*Philypnodon grandiceps* (Flathead gudgeon)
Bidyanus bidyanus (Silver perch)	*Prototroctes maraena* (Australian grayling)
Carassius auratus (Gold fish)	*Pseudaphritis urvillii* (Tupong)
Cyprinus carpio (Common carp)	*Pseudogobius olorum* (Bluespot goby)
Gadopsis marmoratus (River blackfish)	*Rutilus rutilus* (Roach)
Galaxias brevipinnis (Climbing galaxias)	*Salmo trutta* (Brown trout)
Galaxias maculatus (Common galaxias)	*Tetractenos glaber* (Smooth toadfish)
Galaxias ornatus (Ornate galaxias)	*Tinca tinca* (Tench)
Galaxias truttaceus (Spotted galaxias)	*Ornithorhynchus anatinus* (Platypus)

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Cherry Creek

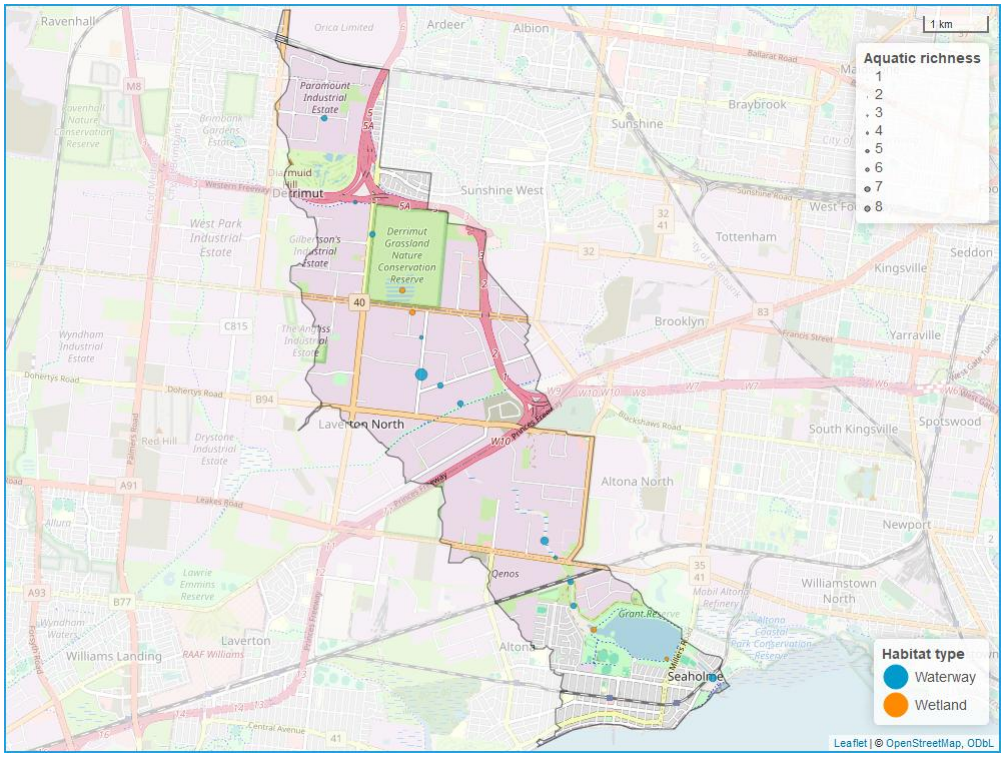

Fig. A9. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 51 samples were collected from 19 sites (Fig. A9)
- 83 aquatic taxa were detected (412 total detections), including 23 non-native species

Detections

Table A9. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Heteroclinus heptaeolus* (Seven-bar weedfish)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Hyperlophus vittatus* (Sandy sprats)
Acanthopagrus butcheri (Black bream)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Aldrichetta forsteri (Yelloweye mullet)	*Philypnodon grandiceps* (Flathead gudgeon)
Anguilla australis (Short finned eel)	*Pseudogobius olorum* (Bluespot goby)
Atherinosoma microstoma (Small-mouth hardyhead)	*Retropinna semoni* (Australian smelt)
Carassius auratus (Gold fish)	*Rhombosolea tapirina* (Greenback flounder)
Cyprinus carpio (Common carp)	*Salmo trutta* (Brown trout)
Galaxias brevipinnis (Climbing galaxias)	*Tasmanogobius lasti* (Scary's tasmangoby)
Galaxias maculatus (Common galaxias)	*Tetractenos glaber* (Smooth toadfish)

Corhanwarrabul, Monbulk and Ferny Creeks

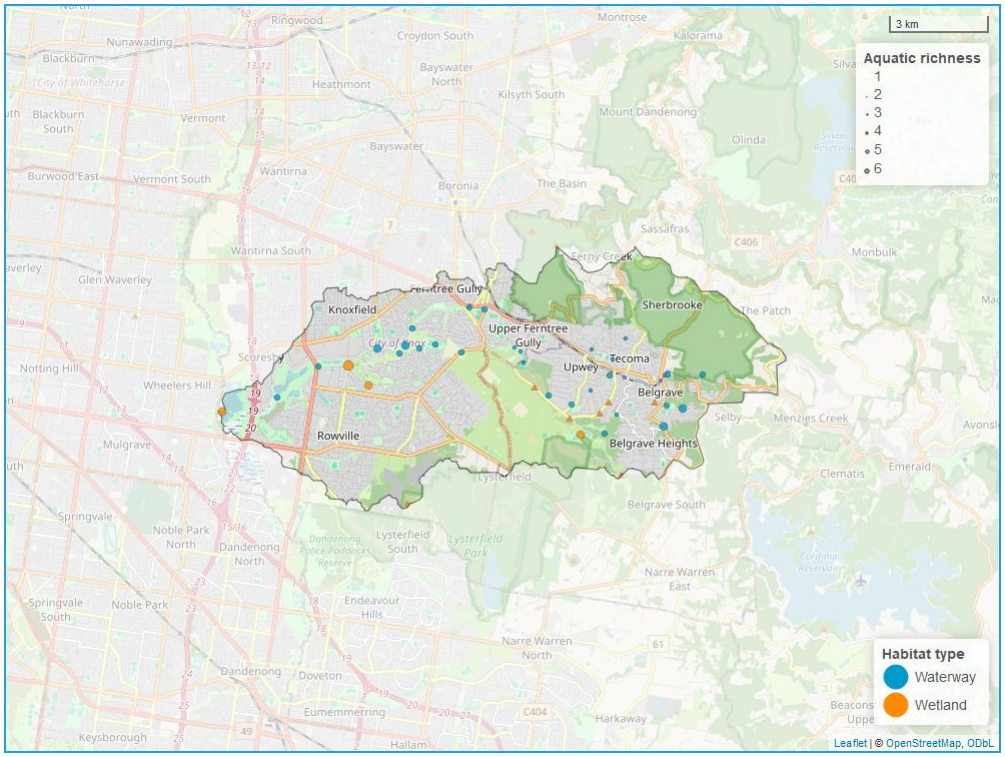

Fig. A10. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 74 samples were collected from 45 sites (Fig. A10)
- 88 taxa were detected (781 total detections); 25 were non-native and 1 were threatened

Detections

Table A10. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias brevipinnis* (Climbing galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Galaxias maculatus* (Common galaxias)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Geotria australis* (Pouched lamprey)
Litoria ewingii OR Litoria verreauxii	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Anguilla sp	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Rutilus rutilus* (Roach)
Cyprinus carpio (Common carp)	*Salmo trutta* (Brown trout)
Gadopsis marmoratus (River blackfish)	*Ornithorhynchus anatinus* (Platypus)

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Dalmore Outfalls

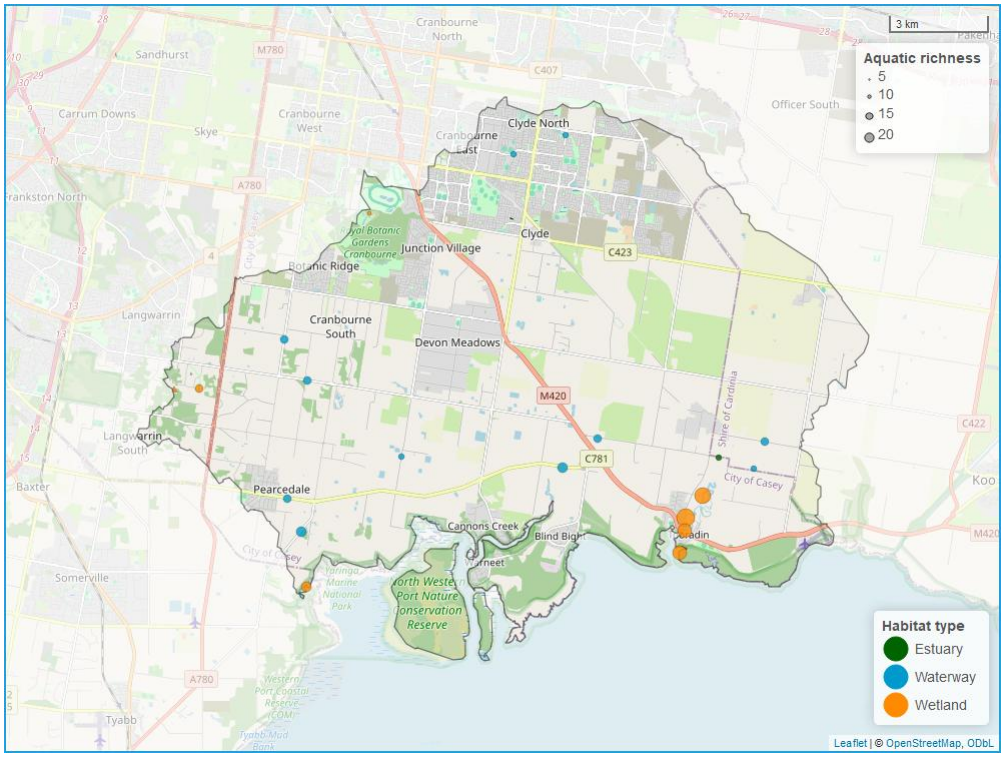

Fig. A11. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 52 samples were collected from 21 sites (Fig. A11)
- 99 taxa were detected (684 total detections); 22 were non-native and 1 were threatened

Detections

Table A11. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Girella tricuspidata* (Luderick)
Limnodynastes dumerilii (Eastern banjo frog)	*Gobiopterus semivestitus* (Glassgoby)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Hyperlophus vittatus* (Sandy sprats)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Hypseleotris sp*
Litoria ewingii OR Litoria verreauxii	*Liza argentea* (Goldspot mullet)
Litoria peronii (Peron's tree frog)	*Meuschenia trachylepis* (Yellowfin leatherjacket)
Acanthopagrus butcheri (Black bream)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Afurcagobius tamarensis (Tamar goby)	*Mugil cephalus* (Sea mullet)
Aldrichetta forsteri (Yelloweye mullet)	*Mugilogobius platynotus* (Pale mangrove goby)
Ammotretis rostratus (Longsnout flounder)	*Nannoperca australis* (Southern pygmy perch)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Anguilla reinhardtii (Longfin eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Arenigobius bifrenatus (Bridled goby)	*Platycephalus sp*
Arenigobius frenatus (Halfbridled goby)	*Pseudaphritis urvillii* (Tupong)
Atherinosoma microstoma (Small-mouth hardyhead)	*Pseudogobius olorum* (Bluespot goby)
Carassius auratus (Gold fish)	*Rhombosolea tapirina* (Greenback flounder)
Chrysophrys auratus (Snapper)	*Rhynchobatus sp*
Cyprinus carpio (Common carp)	*Rutilus rutilus* (Roach)
Galaxias maculatus (Common galaxias)	*Sparidae sp*
Galaxias truttaceus (Spotted galaxias)	*Tetractenos glaber* (Smooth toadfish)
Gambusia holbrooki (Mosquito fish)	*Tinca tinca* (Tench)

Dandenong Creek Lower

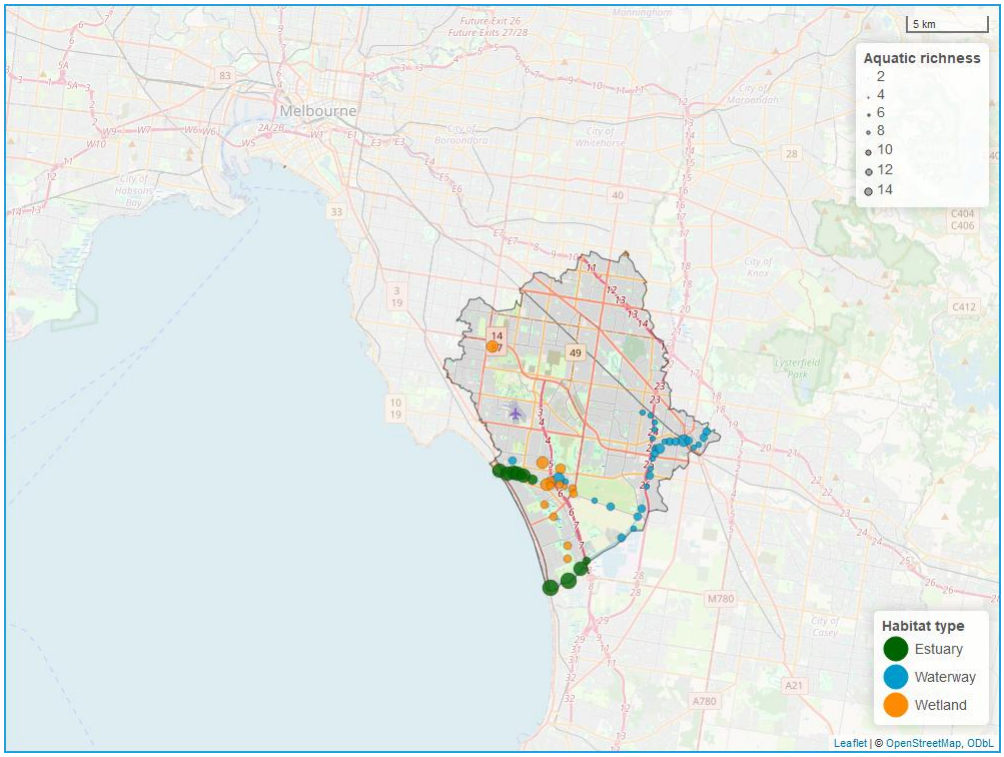

Fig. A12. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 141 samples were collected from 61 sites (Fig. A12)
- 130 taxa were detected (2,162 total detections); 32 were non-native and 4 were threatened

Detections

Table A12. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Geotria australis* (Pouched lamprey)
Limnodynastes dumerilii (Eastern banjo frog)	*Gobiopterus semivestitus* (Glassgoby)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Hyperlophus sp*
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Hyperlophus vittatus* (Sandy sprats)
Lissotriton vulgaris (Common newt or smooth newt)	*Hypseleotris sp*
Litoria ewingii OR Litoria verreauxii	*Lates calcarifer* (Barramundi)
Litoria raniformis (Growling grass frog)	*Liza argentea* (Goldspot mullet)
Acanthogobius flavimanus (Yellowfin goby)	*Maccullochella peelii* (Murray cod)
Acanthopagrus butcheri (Black bream)	*Macquaria ambigua* (Golden perch)
Afurcagobius tamarensis (Tamar goby)	*Macquaria colonorum* (Estuary perch)
Aldrichetta forsteri (Yelloweye mullet)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Ammotretis rostratus (Longsnout flounder)	*Mugil cephalus* (Sea mullet)
Anguilla australis (Short finned eel)	*Nannoperca australis* (Southern pygmy perch)
Anguilla reinhardtii (Longfin eel)	*Oncorhynchus mykiss* (Rainbow trout)
Arenigobius bifrenatus (Bridled goby)	*Perca fluviatilis* (Redfin perch)
Arenigobius frenatus (Halfbridled goby)	*Philypnodon grandiceps* (Flathead gudgeon)
Atherinosoma microstoma (Small-mouth hardyhead)	*Platycephalus sp*
Bidyanus bidyanus (Silver perch)	*Prototroctes maraena* (Australian grayling)
Carassius auratus (Gold fish)	*Pseudaphritis urvillii* (Tupong)
Chrysophrys auratus (Snapper)	*Pseudogobius olorum* (Bluespot goby)
Cyprinus carpio (Common carp)	*Redigobius macrostoma* (Largemouth goby)
Decapterus sp	*Rutilus rutilus* (Roach)
Galaxias brevipinnis (Climbing galaxias)	*Salmo trutta* (Brown trout)
Galaxias maculatus (Common galaxias)	*Tasmanogobius lasti* (Scary's tasmangoby)
Galaxias truttaceus (Spotted galaxias)	*Tetractenos glaber* (Smooth toadfish)
Gambusia holbrooki (Mosquito fish)	*Tinca tinca* (Tench)

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Dandenong Creek Middle

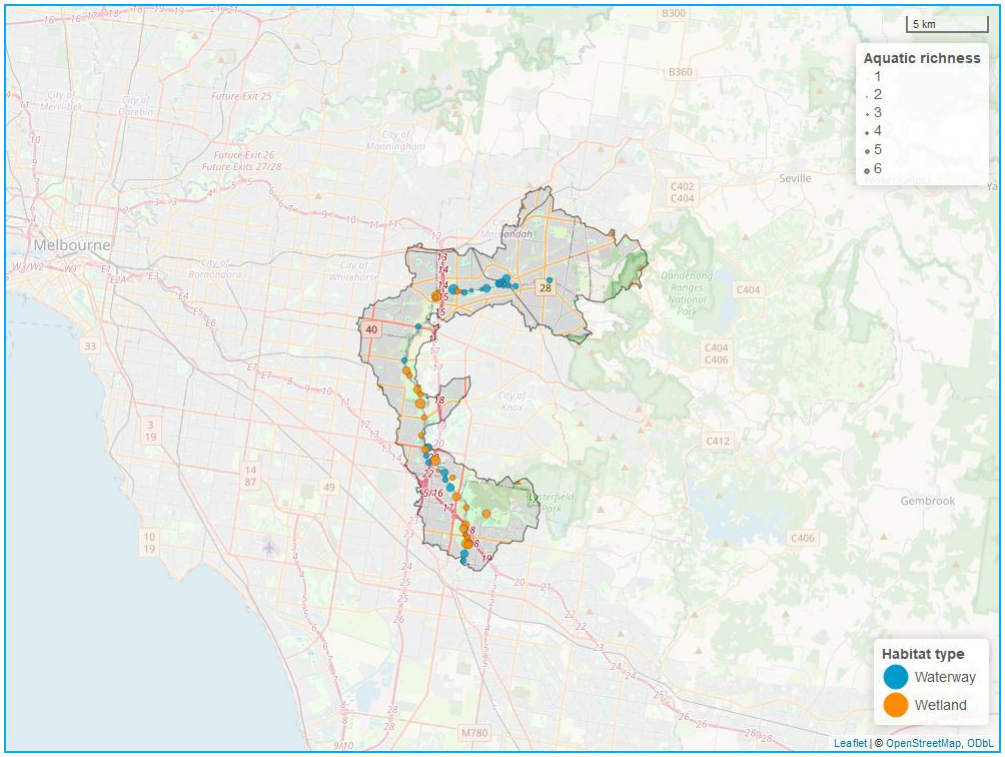

Fig. A13. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 91 samples were collected from 53 sites (Fig. A13)
- 101 taxa were detected (1,520 total detections); 27 were non-native and 2 were threatened

Detections

Table A13. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxiella pusilla* (Dwarf galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Geotria australis* (Pouched lamprey)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Lates calcarifer* (Barramundi)
Litoria ewingii OR Litoria verreauxii	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria peronii (Peron's tree frog)	*Nannoperca australis* (Southern pygmy perch)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Carassius auratus (Gold fish)	*Philypnodon grandiceps* (Flathead gudgeon)
Chrysophrys auratus (Snapper)	*Pseudaphritis urvillii* (Tupong)
Cyprinus carpio (Common carp)	*Rutilus rutilus* (Roach)
Galaxias brevipinnis (Climbing galaxias)	*Salmo trutta* (Brown trout)
Galaxias maculatus (Common galaxias)	*Ornithorhynchus anatinus* (Platypus)
Galaxias ornatus (Ornate galaxias)	

Dandenong Creek Upper

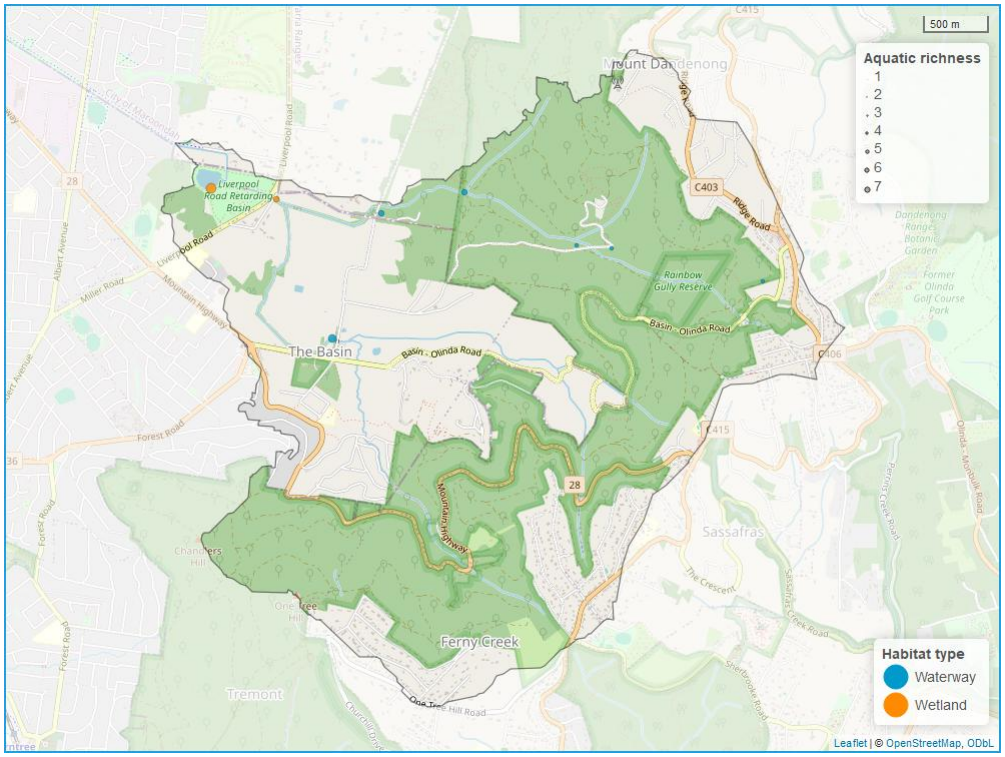

Fig. A14. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 36 samples were collected from 12 sites (Fig. A14)
- 63 aquatic taxa were detected (304 total detections), including 15 non-native species

Detections

Table A14. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Anguilla sp*
Limnodynastes dumerilii (Eastern banjo frog)	*Carassius auratus* (Gold fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Cyprinus carpio* (Common carp)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Galaxias brevipinnis* (Climbing galaxias)
Litoria ewingii OR Litoria verreauxii	*Galaxias ornatus* (Ornate galaxias)
Litoria sp	*Gambusia holbrooki* (Mosquito fish)
Anguilla australis (Short finned eel)	*Nannoperca australis* (Southern pygmy perch)

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Darebin Creek

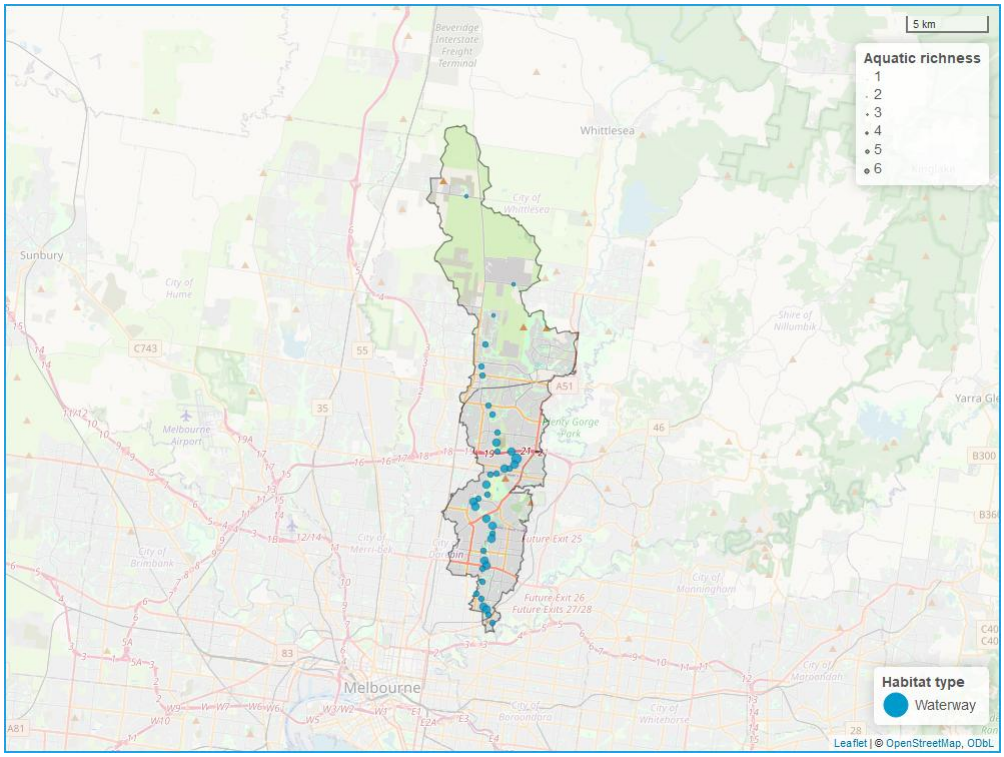

Fig. A15. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 62 samples were collected from 38 sites (Fig. A15)
- 92 taxa were detected (1,020 total detections); 28 were non-native and 1 were threatened

Detections

Table A15. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias ornatus* (Ornate galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Carassius auratus (Gold fish)	*Philypnodon grandiceps* (Flathead gudgeon)
Cyprinus carpio (Common carp)	*Rutilus rutilus* (Roach)
Gadopsis marmoratus (River blackfish)	*Salmo trutta* (Brown trout)
Galaxias brevipinnis (Climbing galaxias)	*Ornithorhynchus anatinus* (Platypus)
Galaxias maculatus (Common galaxias)	

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Deep Creek Lower

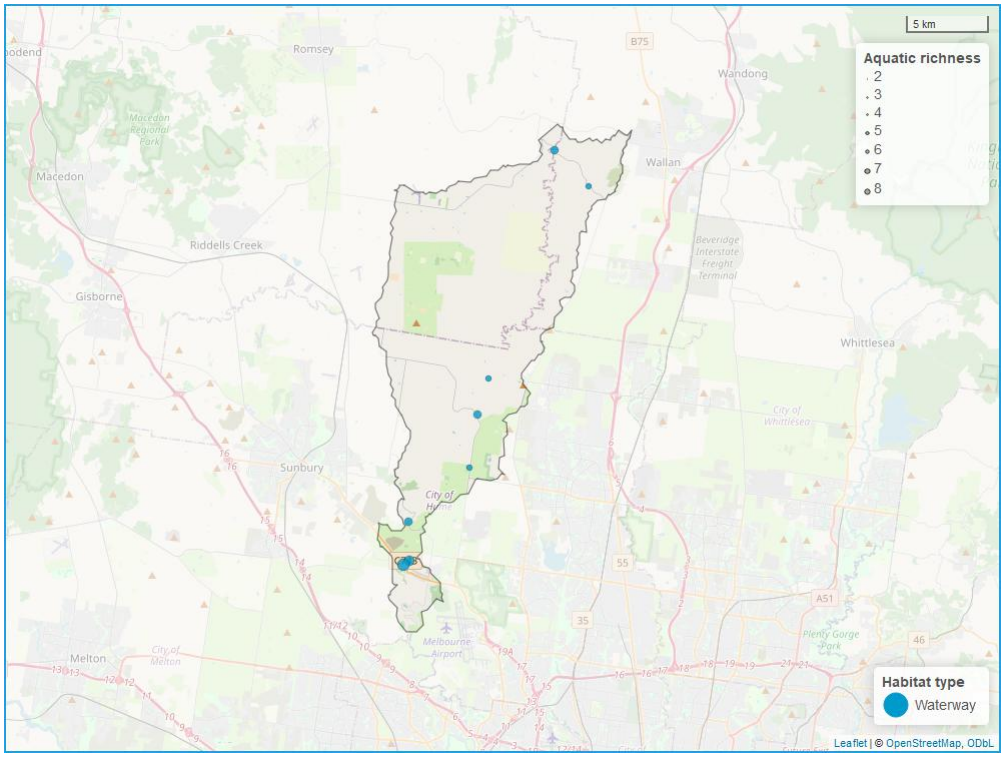

Fig. A16. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 22 samples were collected from 8 sites (Fig. A16)
- 67 taxa were detected (264 total detections); 19 were non-native and 1 were threatened

Detections

Table A16. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Nannoperca australis* (Southern pygmy perch)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Perca fluviatilis* (Redfin perch)
Litoria ewingii OR Litoria verreauxii	*Philypnodon grandiceps* (Flathead gudgeon)
Litoria lesueurii (Lesueur's frog (rocky river frog))	*Retropinna semoni* (Australian smelt)
Anguilla australis (Short finned eel)	*Rutilus rutilus* (Roach)
Carassius auratus (Gold fish)	*Salmo trutta* (Brown trout)
Cyprinus carpio (Common carp)	*Tinca tinca* (Tench)
Galaxias maculatus (Common galaxias)	*Ornithorhynchus anatinus* (Platypus)
Galaxias ornatus (Ornate galaxias)	

Deep Creek Upper

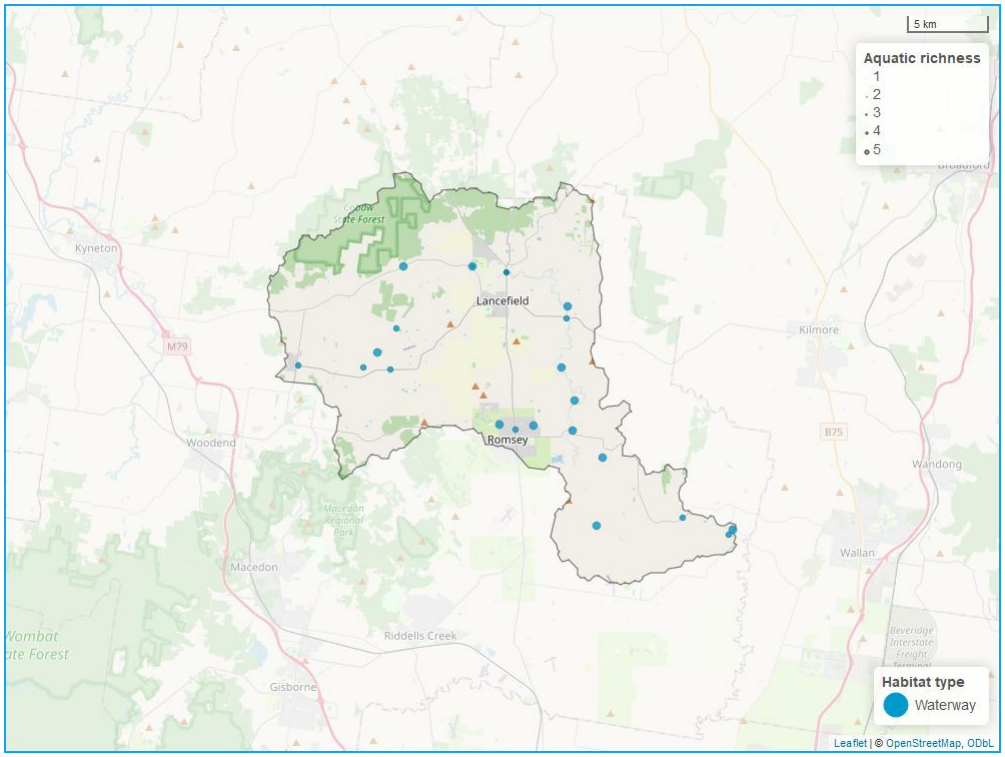

Fig. A17. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 51 samples were collected from 21 sites (Fig. A17)
- 72 taxa were detected (535 total detections); 20 were non-native and 2 were threatened

Detections

Table A17. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia parinsignifera (Eastern sign-bearing froglet (plains froglet))	*Gambusia holbrooki* (Mosquito fish)
Crinia signifera (Eastern common froglet)	*Nannoperca australis* (Southern pygmy perch)
Limnodynastes dumerilii (Eastern banjo frog)	*Nannoperca obscura* (Yarra pygmy perch)
Litoria ewingii OR Litoria verreauxii	*Oncorhynchus mykiss* (Rainbow trout)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Carassius auratus (Gold fish)	*Philypnodon grandiceps* (Flathead gudgeon)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Galaxias maculatus (Common galaxias)	*Tinca tinca* (Tench)
Galaxias ornatus (Ornate galaxias)	*Ornithorhynchus anatinus* (Platypus)

Diamond Creek (Rural)

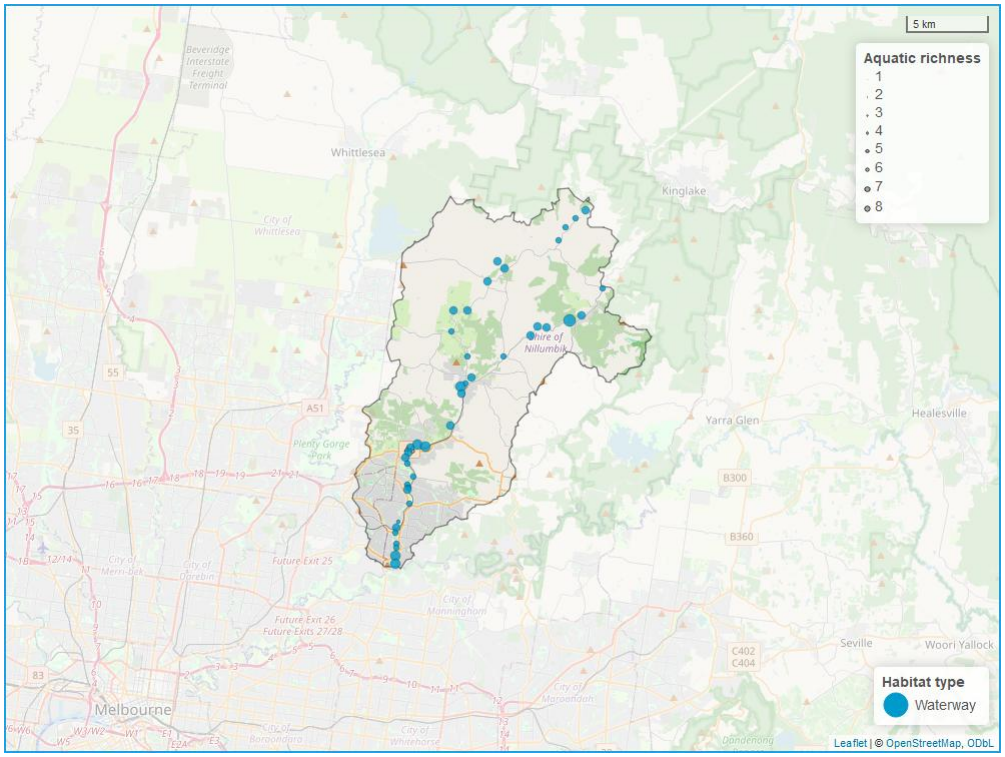

Fig. A18. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 70 samples were collected from 41 sites (Fig. A18)
- 104 taxa were detected (1,077 total detections); 29 were non-native and 2 were threatened

Detections

Table A18. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias ornatus* (Ornate galaxias)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Macquaria australasica* (Macquarie perch)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Nannoperca australis* (Southern pygmy perch)
Litoria ewingii OR Litoria verreauxii	*Oncorhynchus mykiss* (Rainbow trout)
Litoria peronii (Peron's tree frog)	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Retropinna semoni* (Australian smelt)
Cyprinus carpio (Common carp)	*Rutilus rutilus* (Roach)
Gadopsis marmoratus (River blackfish)	*Salmo trutta* (Brown trout)
Galaxias brevipinnis (Climbing galaxias)	*Tinca tinca* (Tench)
Galaxias maculatus (Common galaxias)	*Ornithorhynchus anatinus* (Platypus)

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Diamond Creek (Source)

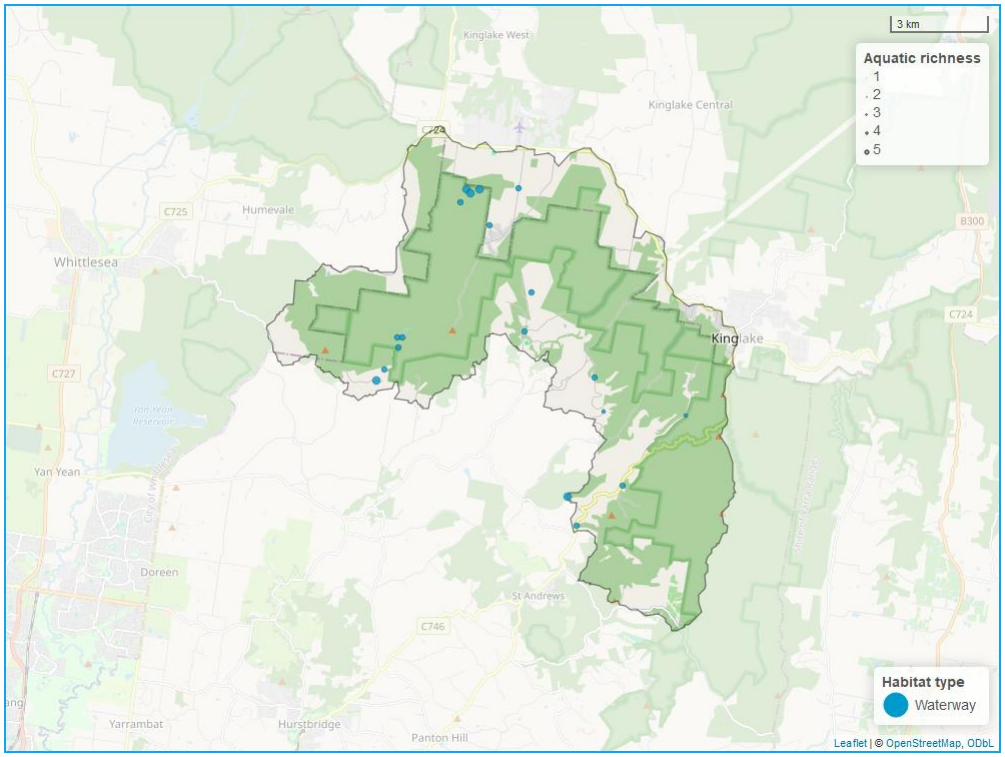

Fig. A19. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 34 samples were collected from 21 sites (Fig. A19)
- 57 aquatic taxa were detected (296 total detections), including 16 non-native species

Detections

Table A19. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias brevipinnis* (Climbing galaxias)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Galaxias ornatus* (Ornate galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Litoria ewingii OR Litoria verreauxii	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria peronii (Peron's tree frog)	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Rutilus rutilus* (Roach)
Gadopsis marmoratus (River blackfish)	*Salmo trutta* (Brown trout)

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Emu Creek

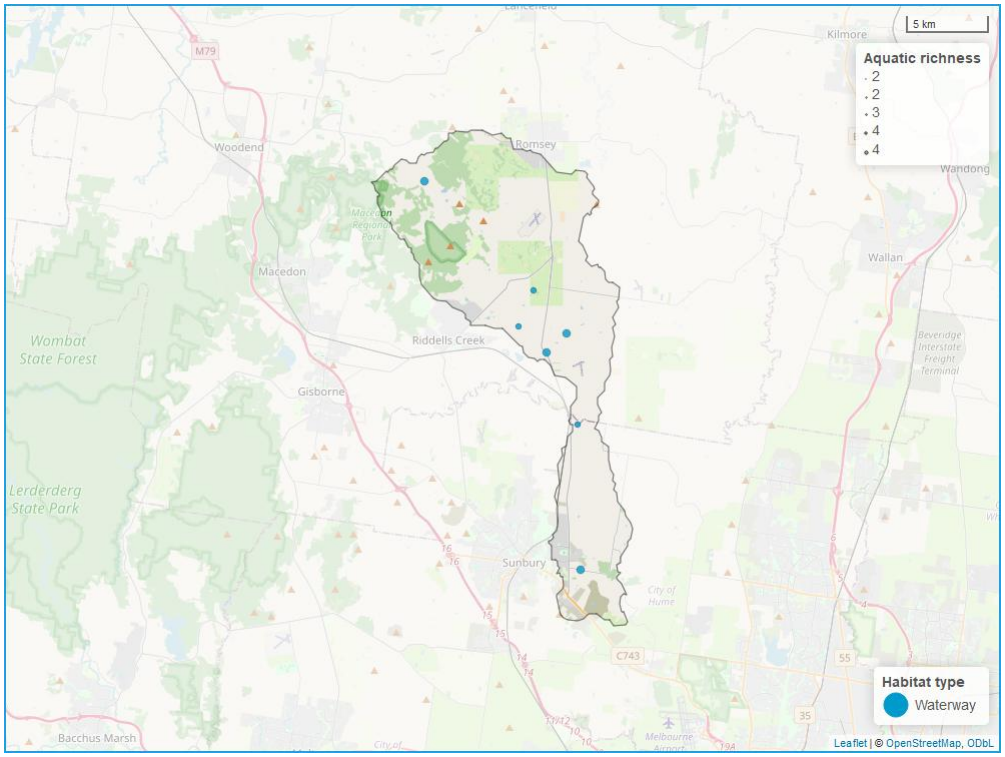

Fig. A20. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 20 samples were collected from 7 sites (Fig. A20)
- 59 aquatic taxa were detected (212 total detections), including 19 non-native species

Detections

Table A20. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Cyprinus carpio (Common carp)	*Salmo trutta* (Brown trout)
Galaxias ornatus (Ornate galaxias)	*Tinca tinca* (Tench)

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Eumemmerring Creek

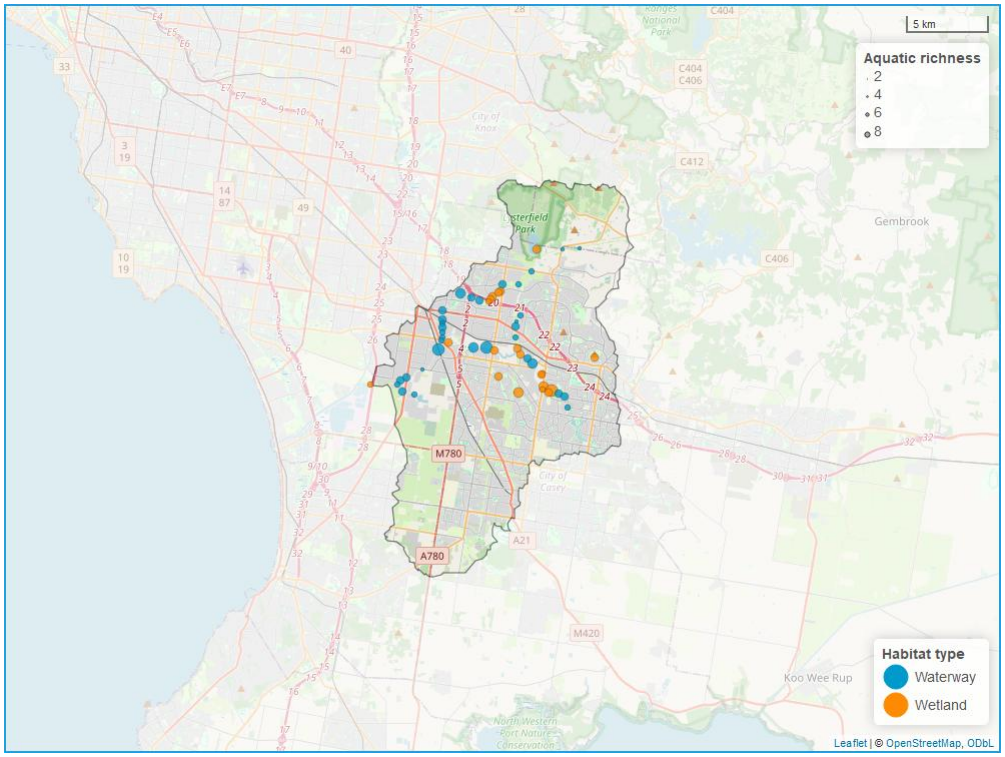

Fig. A21. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 124 samples were collected from 57 sites (Fig. A21)
- 105 taxa were detected (1,850 total detections); 29 were non-native and 1 were threatened

Detections

Table A21. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Geotria australis* (Pouched lamprey)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Hypseleotris sp*
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Macquaria colonorum* (Estuary perch)
Litoria ewingii OR Litoria verreauxii	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Anguilla australis (Short finned eel)	*Mugil cephalus* (Sea mullet)
Anguilla sp	*Nannoperca australis* (Southern pygmy perch)
Carassius auratus (Gold fish)	*Oncorhynchus mykiss* (Rainbow trout)
Cyprinus carpio (Common carp)	*Perca fluviatilis* (Redfin perch)
Galaxias brevipinnis (Climbing galaxias)	*Philypnodon grandiceps* (Flathead gudgeon)
Galaxias maculatus (Common galaxias)	*Pseudaphritis urvillii* (Tupong)
Galaxias truttaceus (Spotted galaxias)	*Rutilus rutilus* (Roach)
Galaxiella pusilla (Dwarf galaxias)	*Salmo trutta* (Brown trout)

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French and Phillip Islands

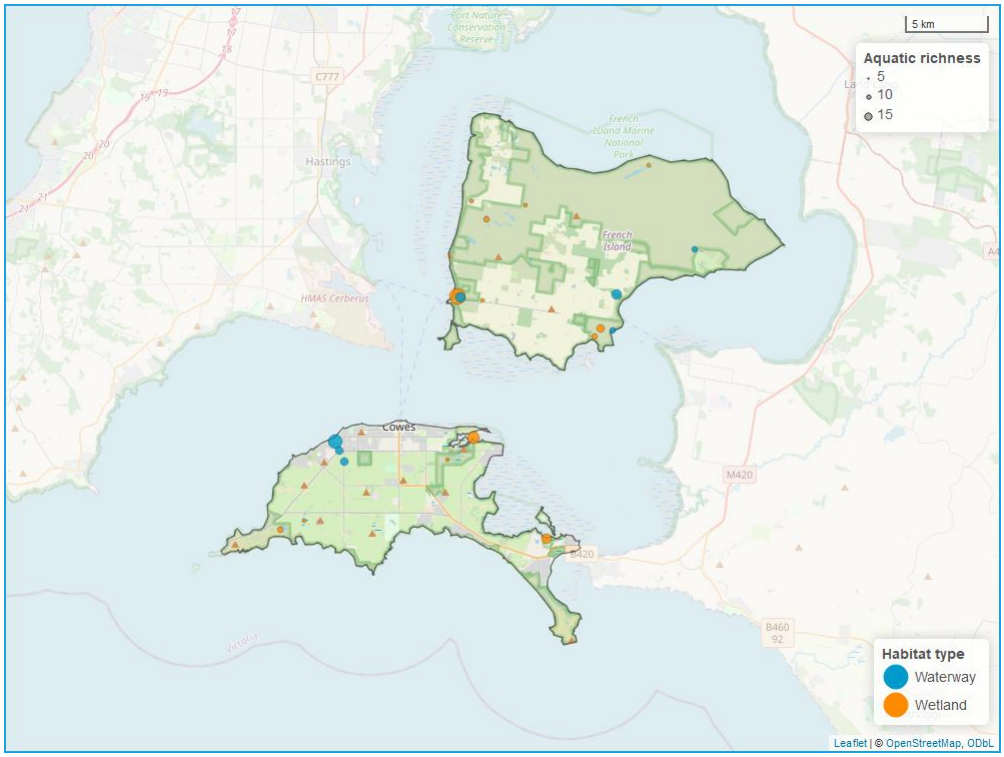

Fig. A22. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 71 samples were collected from 23 sites (Fig. A22)
- 118 taxa were detected (597 total detections); 12 were non-native and 1 were threatened

Detections

Table A22. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Girella tricuspidata* (Luderick)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Girella zebra* (Zebra fish)
Litoria ewingii OR Litoria verreauxii	*Gobiopterus semivestitus* (Glassgoby)
Litoria sp	*Heteroclinus sp*
Acanthaluteres sp	*Liza argentea* (Goldspot mullet)
Acanthopagrus butcheri (Black bream)	*Macquaria colonorum* (Estuary perch)
Afurcagobius tamarensis (Tamar goby)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Aldrichetta forsteri (Yelloweye mullet)	*Mugil cephalus* (Sea mullet)
Ammotretis rostratus (Longsnout flounder)	*Mugilogobius platynotus* (Pale mangrove goby)
Anguilla australis (Short finned eel)	*Nannoperca australis* (Southern pygmy perch)
Arenigobius bifrenatus (Bridled goby)	*Platycephalus sp*
Arenigobius frenatus (Halfbridled goby)	*Pseudaphritis urvillii* (Tupong)
Atherinosoma microstoma (Small-mouth hardyhead)	*Pseudogobius olorum* (Bluespot goby)
Chrysophrys auratus (Snapper)	*Rhynchobatus sp*
Cyprinus carpio (Common carp)	*Scobinichthys granulatus* (Rough leatherjacket)
Galaxias brevipinnis (Climbing galaxias)	*Sillaginodes punctatus* (King george whiting)
Galaxias maculatus (Common galaxias)	*Tetractenos glaber* (Smooth toadfish)
Galaxias truttaceus (Spotted galaxias)	

Gardiners Creek

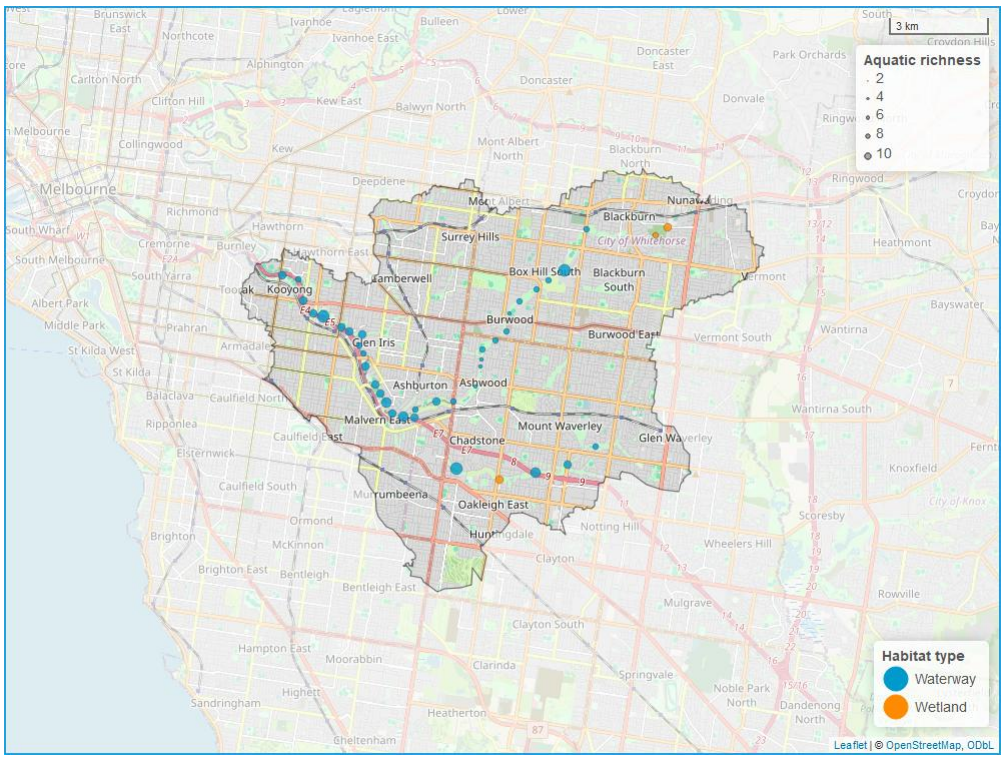

Fig. A23. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 78 samples were collected from 39 sites (Fig. A23)
- 103 aquatic taxa were detected (1,585 total detections), including 27 non-native species

Detections

Table A23. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia parinsignifera (Eastern sign-bearing froglet (plains froglet))	*Galaxias maculatus* (Common galaxias)
Crinia signifera (Eastern common froglet)	*Galaxias truttaceus* (Spotted galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Lates calcarifer* (Barramundi)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Macquaria colonorum* (Estuary perch)
Litoria ewingii OR Litoria verreauxii	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria peronii (Peron's tree frog)	*Perca fluviatilis* (Redfin perch)
Acanthopagrus butcheri (Black bream)	*Philypnodon grandiceps* (Flathead gudgeon)
Anguilla australis (Short finned eel)	*Pseudaphritis urvillii* (Tupong)
Carassius auratus (Gold fish)	*Rutilus rutilus* (Roach)
Chrysophrys auratus (Snapper)	*Salmo trutta* (Brown trout)
Cyprinus carpio (Common carp)	*Sillaginodes punctatus* (King george whiting)
Engraulis australis (Australian anchovy)	*Tetractenos glaber* (Smooth toadfish)
Galaxias brevipinnis (Climbing galaxias)	

Jacksons Creek

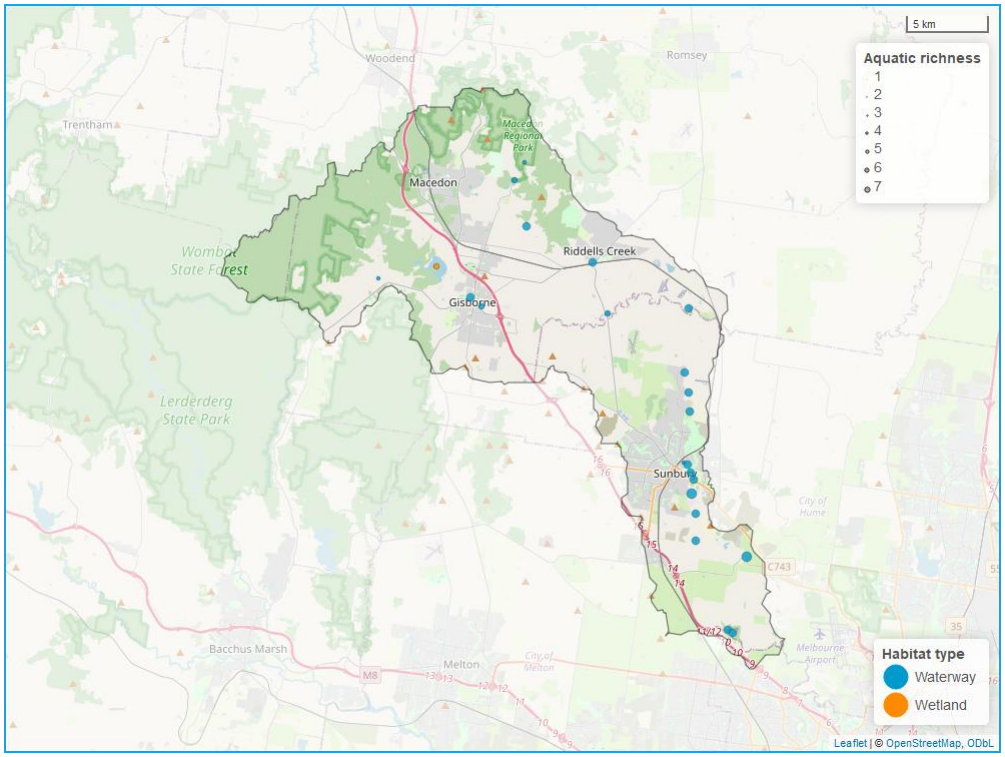

Fig. A24. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 44 samples were collected from 23 sites (Fig. A24)
- 95 taxa were detected (704 total detections); 24 were non-native and 1 were threatened

Detections

Table A24. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Limnodynastes dumerilii (Eastern banjo frog)	*Nannoperca australis* (Southern pygmy perch)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Oncorhynchus mykiss* (Rainbow trout)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Perca fluviatilis* (Redfin perch)
Litoria ewingii OR Litoria verreauxii	*Philypnodon grandiceps* (Flathead gudgeon)
Anguilla australis (Short finned eel)	*Retropinna semoni* (Australian smelt)
Carassius auratus (Gold fish)	*Rutilus rutilus* (Roach)
Cyprinus carpio (Common carp)	*Salmo trutta* (Brown trout)
Galaxias maculatus (Common galaxias)	*Tinca tinca* (Tench)
Galaxias ornatus (Ornate galaxias)	*Ornithorhynchus anatinus* (Platypus)
Gambusia holbrooki (Mosquito fish)	

Kananook Creek

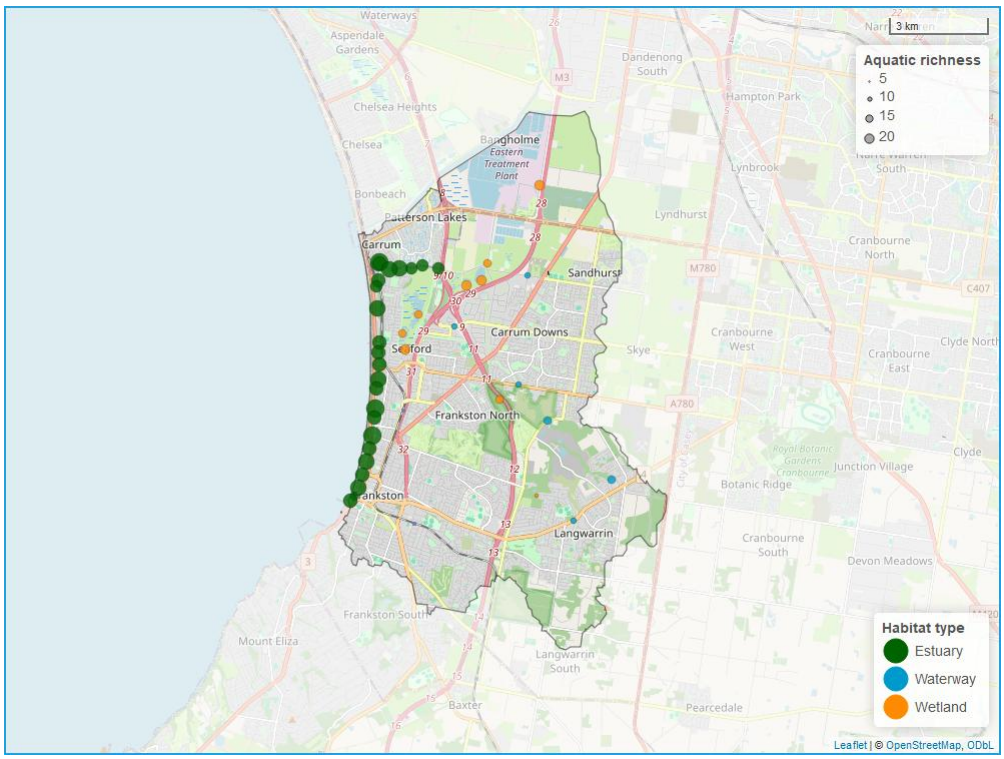

Fig. A25. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 88 samples were collected from 40 sites (Fig. A25)
- 132 taxa were detected (1,584 total detections); 24 were non-native and 2 were threatened

Detections

Table A25. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias maculatus* (Common galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Galaxias truttaceus* (Spotted galaxias)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Galaxiella pusilla* (Dwarf galaxias)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Litoria ewingii OR Litoria verreauxii	*Geotria australis* (Pouched lamprey)
Litoria peronii (Peron's tree frog)	*Gobiopterus semivestitus* (Glassgoby)
Litoria raniformis (Growling grass frog)	*Hyperlophus vittatus* (Sandy sprats)
Litoria sp	*Hypseleotris sp*
Acanthogobius flavimanus (Yellowfin goby)	*Liza argentea* (Goldspot mullet)
Acanthopagrus butcheri (Black bream)	*Macquaria colonorum* (Estuary perch)
Afurcagobius tamarensis (Tamar goby)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Aldrichetta forsteri (Yelloweye mullet)	*Neoodax balteatus* (Little weed whiting)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Arenigobius bifrenatus (Bridled goby)	*Pseudaphritis urvillii* (Tupong)
Arenigobius frenatus (Halfbridled goby)	*Pseudogobius olorum* (Bluespot goby)
Arripis trutta (Australian salmon)	*Redigobius macrostoma* (Largemouth goby)
Atherinosoma microstoma (Small-mouth hardyhead)	*Rhombosolea tapirina* (Greenback flounder)
Carassius auratus (Gold fish)	*Scobinichthys granulatus* (Rough leatherjacket)
Chrysophrys auratus (Snapper)	*Tasmanogobius lasti* (Scary's tasmangoby)
Cyprinus carpio (Common carp)	*Tetractenos glaber* (Smooth toadfish)
Galaxias brevipinnis (Climbing galaxias)	

King Parrot and Musk Creeks

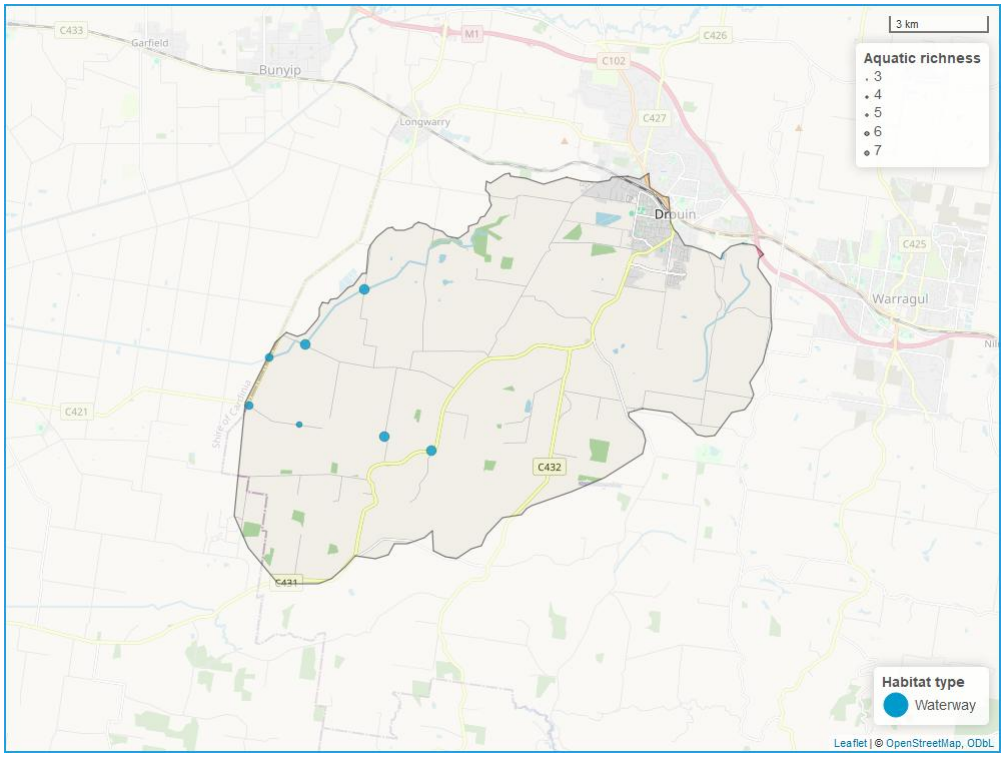

Fig. A26. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 21 samples were collected from 7 sites (Fig. A26)
- 56 taxa were detected (294 total detections); 18 were non-native and 1 were threatened

Detections

Table A26. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias maculatus* (Common galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Nannoperca australis* (Southern pygmy perch)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Perca fluviatilis* (Redfin perch)
Litoria ewingii OR Litoria verreauxii	*Philypnodon grandiceps* (Flathead gudgeon)
Anguilla australis (Short finned eel)	*Prototroctes maraena* (Australian grayling)
Carassius auratus (Gold fish)	*Pseudaphritis urvillii* (Tupong)
Cyprinus carpio (Common carp)	*Pseudomugil sp*
Galaxias brevipinnis (Climbing galaxias)	

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Koonung Creek

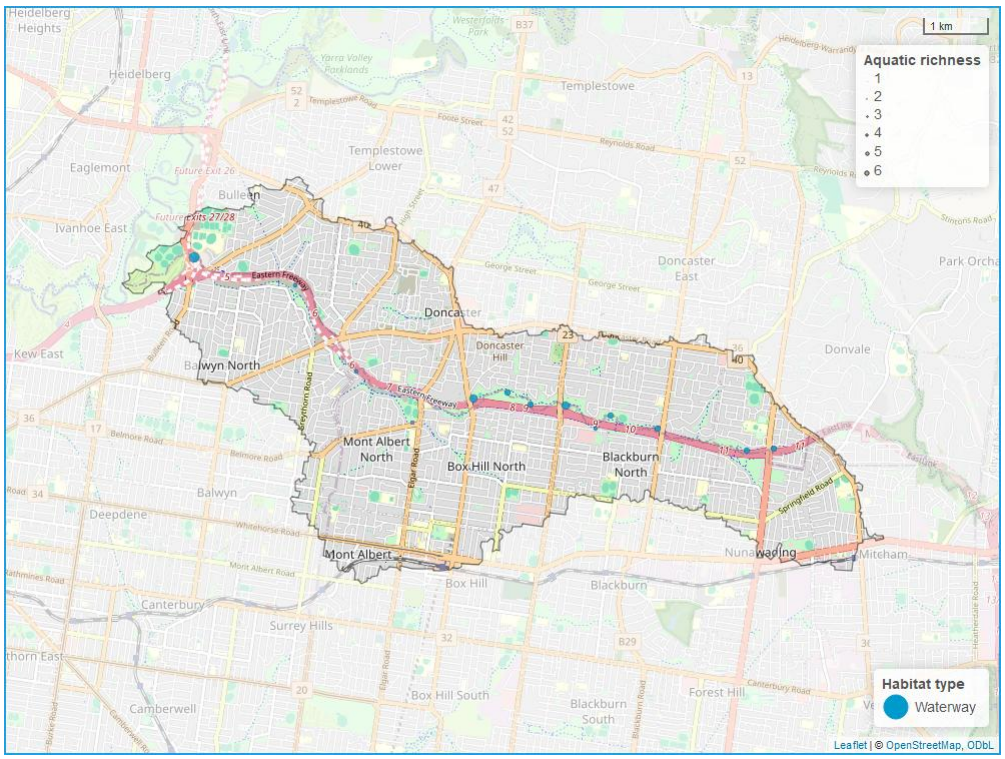

Fig. A27. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 37 samples were collected from 12 sites (Fig. A27)
- 82 taxa were detected (541 total detections); 21 were non-native and 1 were threatened

Detections

Table A27. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias ornatus* (Ornate galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Haletta semifasciata* (Blue weed whiting)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Maccullochella peelii* (Murray cod)
Litoria ewingii OR Litoria verreauxii	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Anguilla australis (Short finned eel)	*Nannoperca australis* (Southern pygmy perch)
Carassius auratus (Gold fish)	*Neoodax balteatus* (Little weed whiting)
Chrysophrys auratus (Snapper)	*Notolabrus fucicola* (Yellow-saddled wrasse)
Cyprinus carpio (Common carp)	*Olisthops cyanomelas* (Herring cale)
Galaxias brevipinnis (Climbing galaxias)	*Perca fluviatilis* (Redfin perch)
Galaxias maculatus (Common galaxias)	

Kororoit Creek Lower

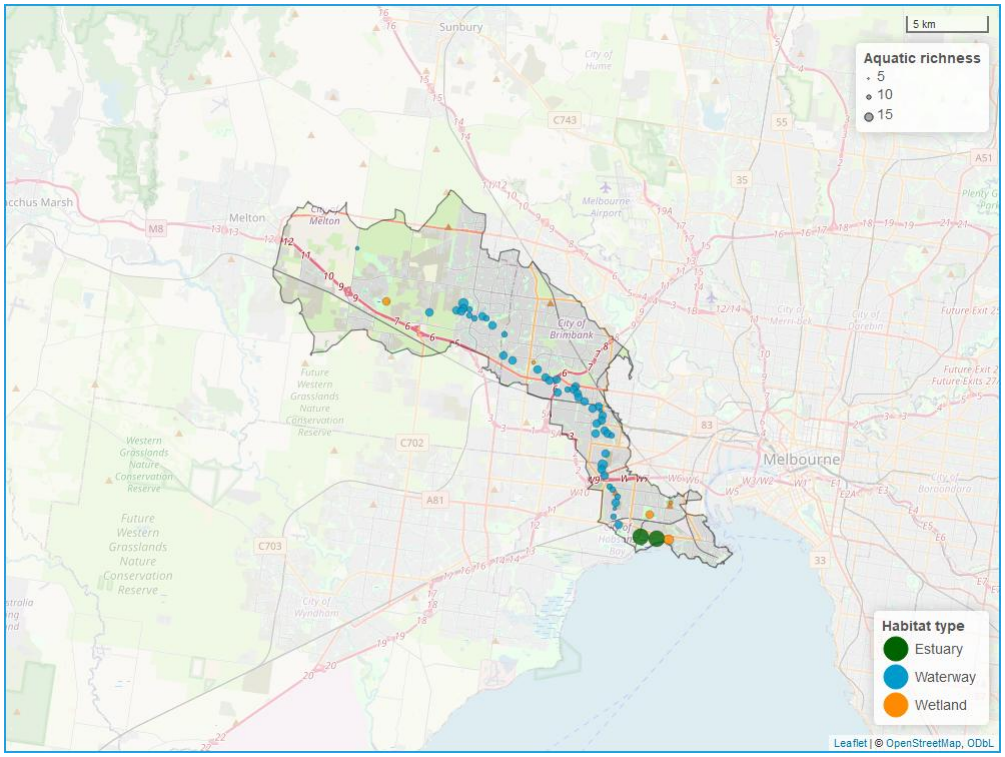

Fig. A28. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 76 samples were collected from 58 sites (Fig. A28)
- 106 taxa were detected (1,032 total detections); 24 were non-native and 1 were threatened

Detections

Table A28. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias truttaceus* (Spotted galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Girella tricuspidata* (Luderick)
Litoria sp	*Gobiopterus semivestitus* (Glassgoby)
Acanthogobius flavimanus (Yellowfin goby)	*Hyperlophus vittatus* (Sandy sprats)
Acanthopagrus butcheri (Black bream)	*Lates calcarifer* (Barramundi)
Afurcagobius tamarensis (Tamar goby)	*Liza argentea* (Goldspot mullet)
Aldrichetta forsteri (Yelloweye mullet)	*Macquaria colonorum* (Estuary perch)
Anguilla australis (Short finned eel)	*Mugil cephalus* (Sea mullet)
Arenigobius bifrenatus (Bridled goby)	*Perca fluviatilis* (Redfin perch)
Arenigobius frenatus (Halfbridled goby)	*Philypnodon grandiceps* (Flathead gudgeon)
Atherinosoma microstoma (Small-mouth hardyhead)	*Prototroctes maraena* (Australian grayling)
Carassius auratus (Gold fish)	*Pseudaphritis urvillii* (Tupong)
Chrysophrys auratus (Snapper)	*Pseudogobius olorum* (Bluespot goby)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Dentex sp	*Tasmanogobius lasti* (Scary's tasmangoby)
Gadopsis marmoratus (River blackfish)	*Tetractenos glaber* (Smooth toadfish)
Galaxias maculatus (Common galaxias)	*Tinca tinca* (Tench)

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Kororoit Creek Upper

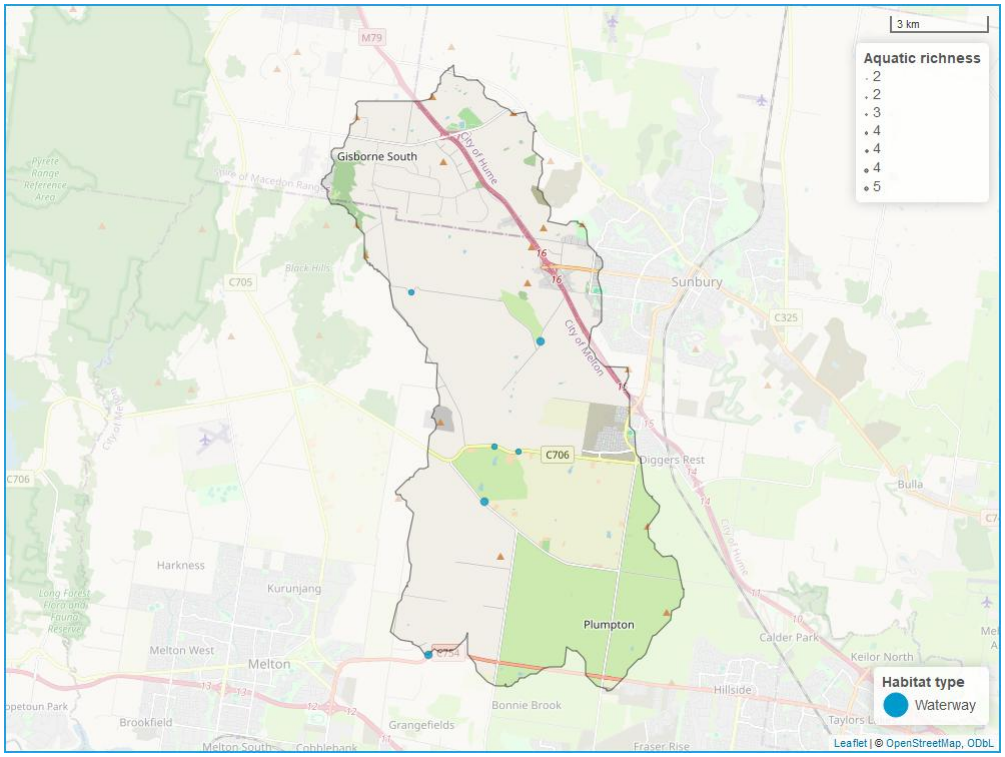

Fig. A29. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 20 samples were collected from 6 sites (Fig. A29)
- 48 aquatic taxa were detected (152 total detections), including 14 non-native species

Detections

Table A29. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Anguilla australis* (Short finned eel)
Limnodynastes dumerilii (Eastern banjo frog)	*Carassius auratus* (Gold fish)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Galaxias maculatus* (Common galaxias)
Litoria ewingii OR Litoria verreauxii	*Galaxias ornatus* (Ornate galaxias)
Litoria peronii (Peron's tree frog)	

Lang Lang River

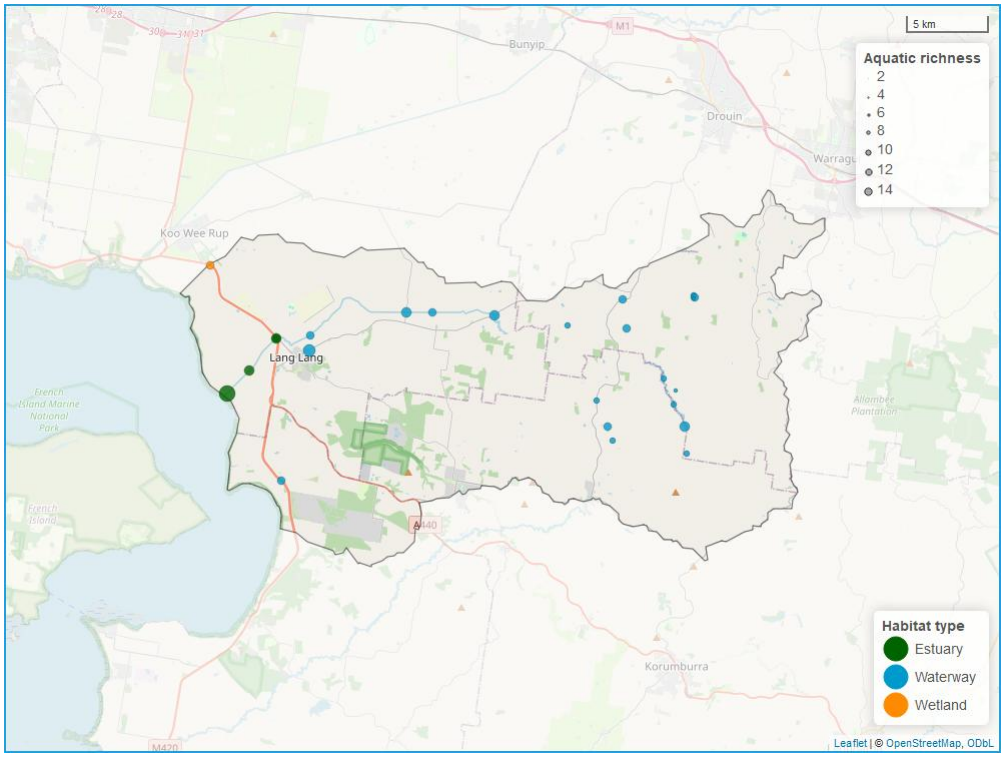

Fig. A30. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 75 samples were collected from 25 sites (Fig. A30)
- 105 taxa were detected (875 total detections); 22 were non-native and 3 were threatened

Detections

Table A30. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxiella pusilla* (Dwarf galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Geotria australis* (Pouched lamprey)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Gobiopterus semivestitus* (Glassgoby)
Litoria ewingii OR Litoria verreauxii	*Hypseleotris sp*
Acanthogobius flavimanus (Yellowfin goby)	*Macquaria colonorum* (Estuary perch)
Acanthopagrus butcheri (Black bream)	*Nannoperca australis* (Southern pygmy perch)
Aldrichetta forsteri (Yelloweye mullet)	*Pagrus sp*
Alopias sp	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon macrostomus* (Dwarf flathead gudgeon)
Arripis trutta (Australian salmon)	*Prototroctes maraena* (Australian grayling)
Atherinosoma microstoma (Small-mouth hardyhead)	*Pseudaphritis urvillii* (Tupong)
Carassius auratus (Gold fish)	*Pseudogobius olorum* (Bluespot goby)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Gadopsis marmoratus (River blackfish)	*Salmo trutta* (Brown trout)
Galaxias brevipinnis (Climbing galaxias)	*Sparidae sp*
Galaxias maculatus (Common galaxias)	*Tetractenos glaber* (Smooth toadfish)
Galaxias truttaceus (Spotted galaxias)	*Ornithorhynchus anatinus* (Platypus)

Laverton Creek

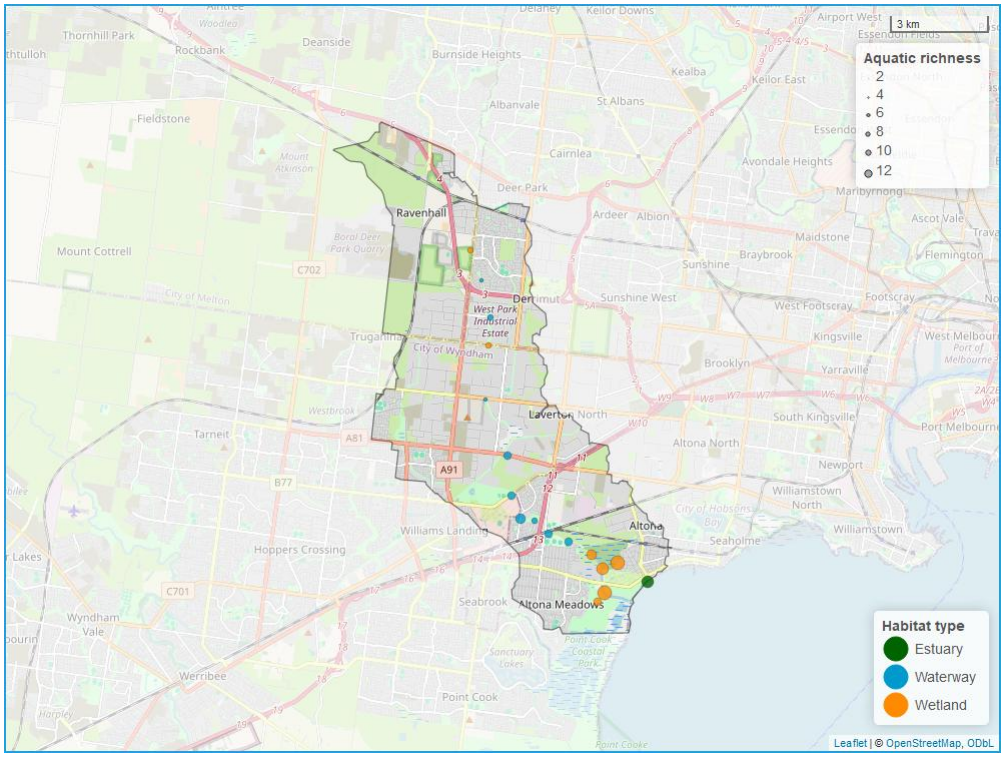

Fig. A31. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 52 samples were collected from 17 sites (Fig. A31)
- 88 aquatic taxa were detected (492 total detections), including 22 non-native species

Detections

Table A31. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias maculatus* (Common galaxias)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Galaxias truttaceus* (Spotted galaxias)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Acanthopagrus butcheri (Black bream)	*Girella tricuspidata* (Luderick)
Afurcagobius tamarensis (Tamar goby)	*Heteroclinus heptaeolus* (Seven-bar weedfish)
Aldrichetta forsteri (Yelloweye mullet)	*Liza argentea* (Goldspot mullet)
Anguilla australis (Short finned eel)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Arenigobius bifrenatus (Bridled goby)	*Philypnodon grandiceps* (Flathead gudgeon)
Arenigobius frenatus (Halfbridled goby)	*Pseudaphritis urvillii* (Tupong)
Arripis trutta (Australian salmon)	*Pseudogobius olorum* (Bluespot goby)
Atherinosoma microstoma (Small-mouth hardyhead)	*Rhombosolea tapirina* (Greenback flounder)
Carassius auratus (Gold fish)	*Rhynchobatus sp*
Chrysophrys auratus (Snapper)	*Salmo trutta* (Brown trout)
Cyprinus carpio (Common carp)	*Tasmanogobius lasti* (Scary's tasmangoby)
Diodon sp	*Tetractenos glaber* (Smooth toadfish)

Lerderderg River

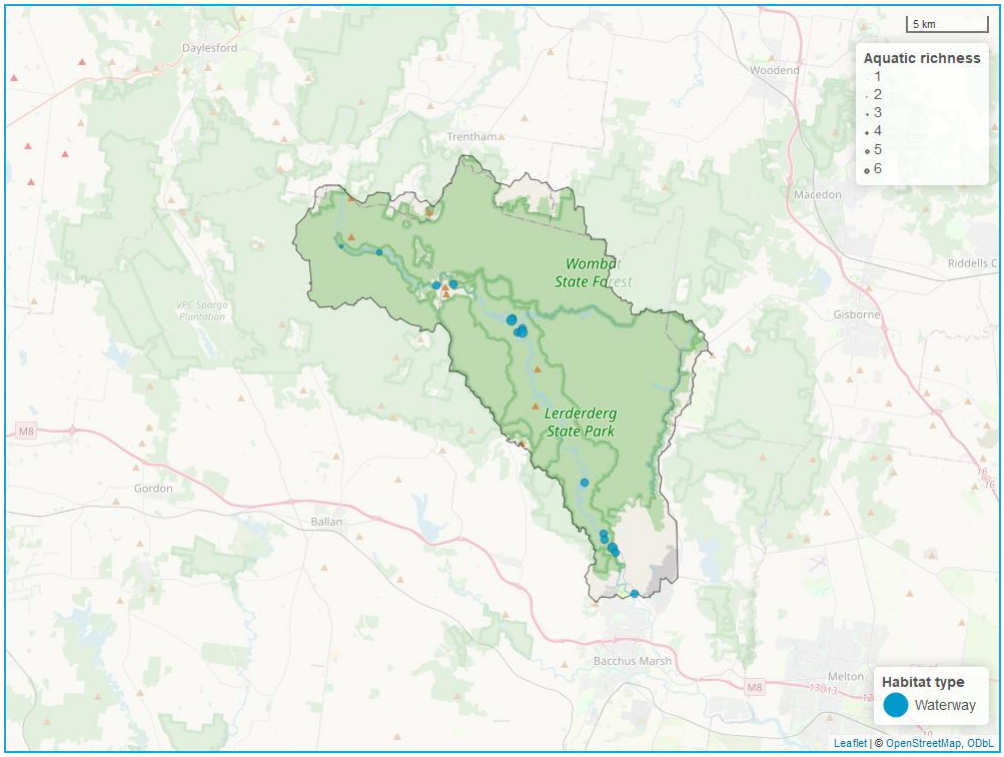

Fig. A32. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 29 samples were collected from 15 sites (Fig. A32)
- 69 taxa were detected (301 total detections); 20 were non-native and 1 were threatened

Detections

Table A32. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias maculatus* (Common galaxias)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Galaxias ornatus* (Ornate galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Litoria ewingii OR Litoria verreauxii	*Nannoperca australis* (Southern pygmy perch)
Litoria lesueurii (Lesueur's frog (rocky river frog))	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Retropinna semoni* (Australian smelt)
Carassius auratus (Gold fish)	*Rutilus rutilus* (Roach)
Cyprinus carpio (Common carp)	*Salmo trutta* (Brown trout)
Gadopsis marmoratus (River blackfish)	*Tinca tinca* (Tench)
Galaxias brevipinnis (Climbing galaxias)	*Ornithorhynchus anatinus* (Platypus)

Little River Lower

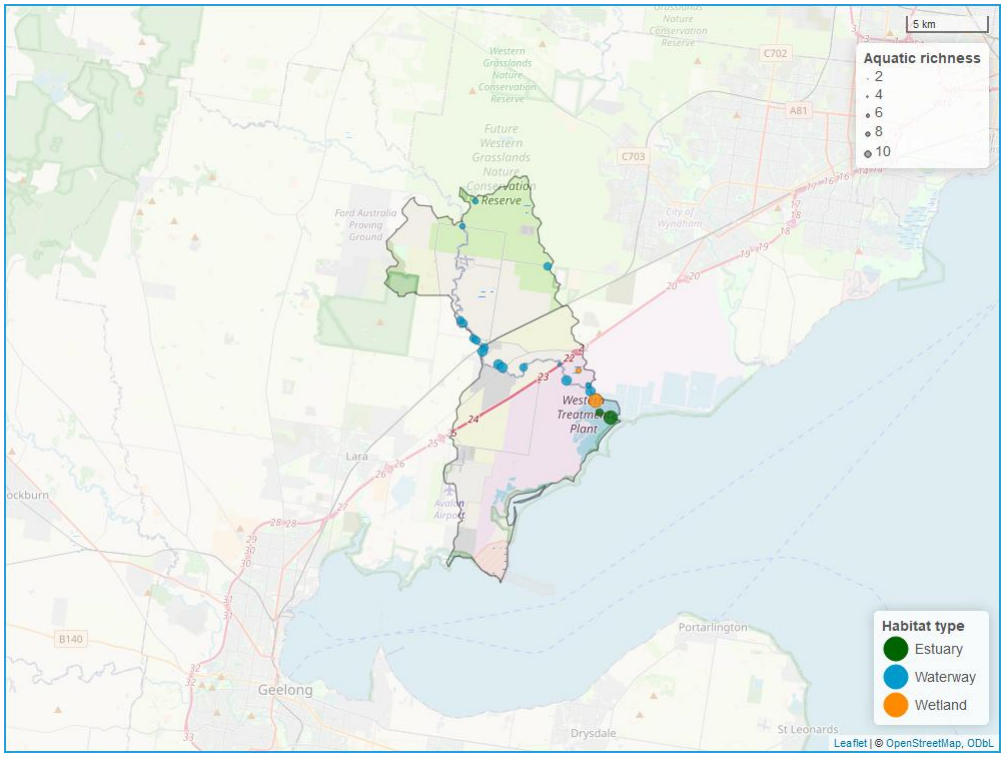

Fig. A33. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 49 samples were collected from 21 sites (Fig. A33)
- 80 aquatic taxa were detected (485 total detections), including 16 non-native species

Detections

Table A33. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias maculatus* (Common galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Gobiopterus semivestitus* (Glassgoby)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Hyperlophus vittatus* (Sandy sprats)
Acanthogobius flavimanus (Yellowfin goby)	*Liza argentea* (Goldspot mullet)
Acanthopagrus butcheri (Black bream)	*Macquaria colonorum* (Estuary perch)
Afurcagobius tamarensis (Tamar goby)	*Philypnodon grandiceps* (Flathead gudgeon)
Aldrichetta forsteri (Yelloweye mullet)	*Pseudaphritis urvillii* (Tupong)
Anguilla australis (Short finned eel)	*Pseudogobius olorum* (Bluespot goby)
Arenigobius bifrenatus (Bridled goby)	*Retropinna semoni* (Australian smelt)
Atherinosoma microstoma (Small-mouth hardyhead)	*Tasmanogobius lasti* (Scary's tasmangoby)
Carassius auratus (Gold fish)	*Tetractenos glaber* (Smooth toadfish)
Cyprinus carpio (Common carp)	*Tinca tinca* (Tench)

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Little River Upper

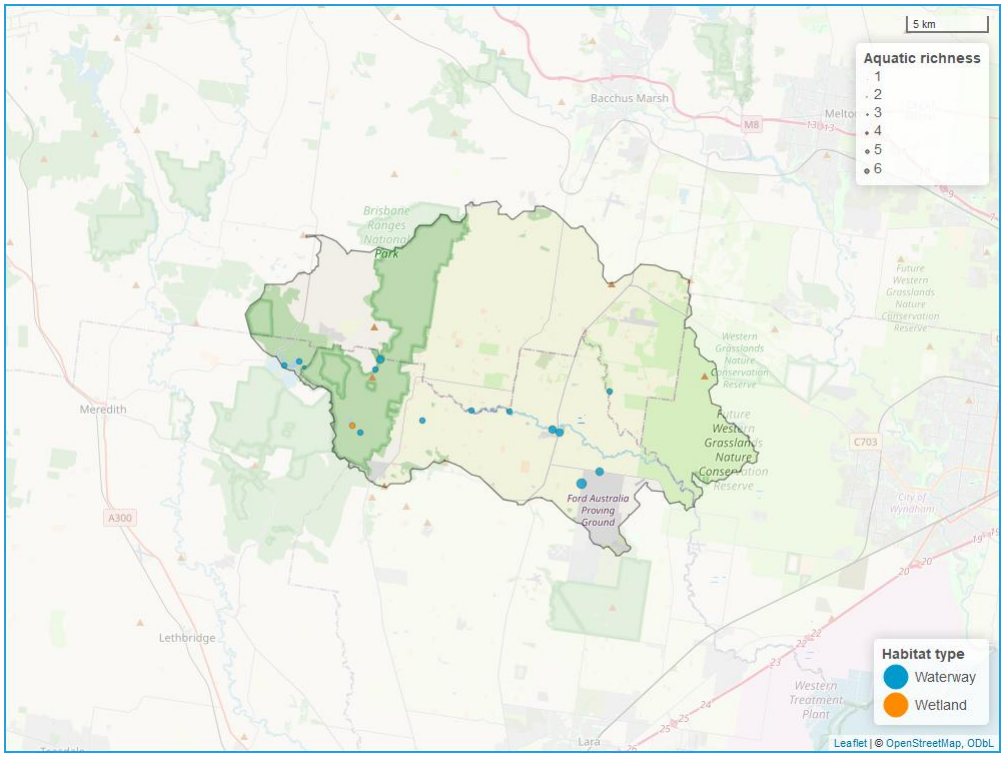

Fig. A34. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 45 samples were collected from 15 sites (Fig. A34)
- 88 taxa were detected (343 total detections); 20 were non-native and 1 were threatened

Detections

Table A34. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Cyprinus carpio* (Common carp)
Limnodynastes dumerilii (Eastern banjo frog)	*Galaxias maculatus* (Common galaxias)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Litoria ewingii OR Litoria verreauxii	*Nannoperca australis* (Southern pygmy perch)
Litoria raniformis (Growling grass frog)	*Oncorhynchus mykiss* (Rainbow trout)
Neobatrachus sudelli (Sudell's frog (common spadefoot toad))	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Atherinosoma microstoma (Small-mouth hardyhead)	*Retropinna semoni* (Australian smelt)
Carassius auratus (Gold fish)	*Salmo trutta* (Brown trout)

Little Yarra River and Hoddles Creek

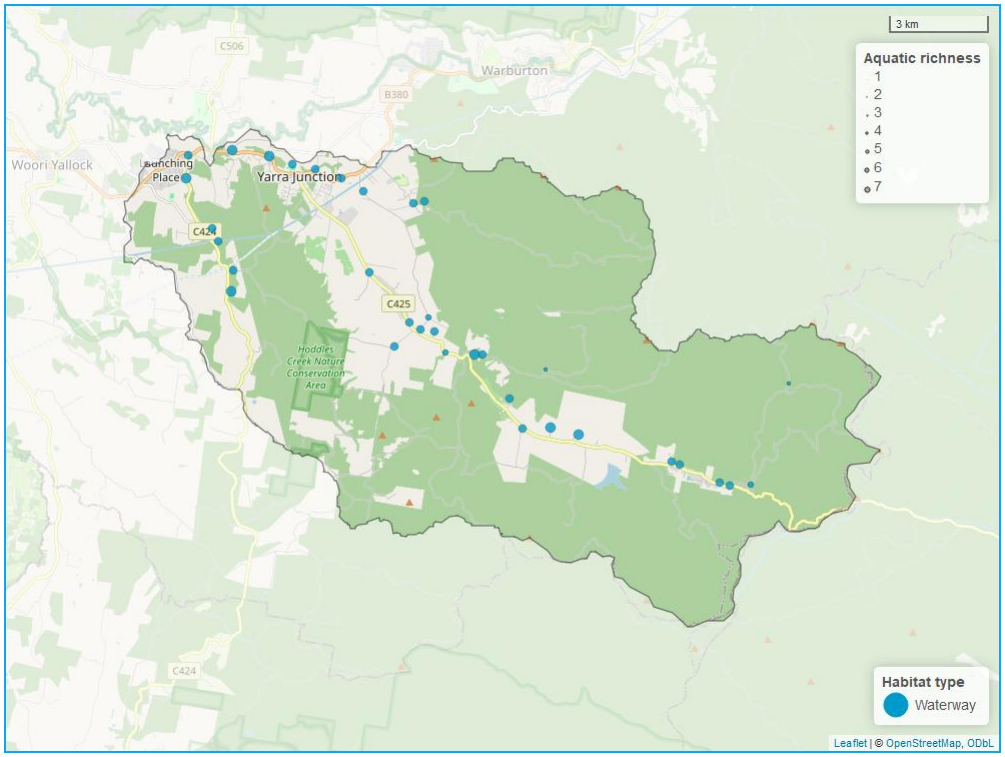

Fig. A35. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 71 samples were collected from 34 sites (Fig. A35)
- 91 taxa were detected (871 total detections); 23 were non-native and 1 were threatened

Detections

Table A35. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Geotria australis* (Pouched lamprey)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria ewingii OR Litoria verreauxii	*Nannoperca australis* (Southern pygmy perch)
Anguilla australis (Short finned eel)	*Oncorhynchus mykiss* (Rainbow trout)
Carassius auratus (Gold fish)	*Perca fluviatilis* (Redfin perch)
Cyprinus carpio (Common carp)	*Philypnodon grandiceps* (Flathead gudgeon)
Gadopsis marmoratus (River blackfish)	*Retropinna semoni* (Australian smelt)
Galaxias brevipinnis (Climbing galaxias)	*Rutilus rutilus* (Roach)
Galaxias ornatus (Ornate galaxias)	*Salmo trutta* (Brown trout)
Gambusia holbrooki (Mosquito fish)	*Ornithorhynchus anatinus* (Platypus)

Lollypop Creek

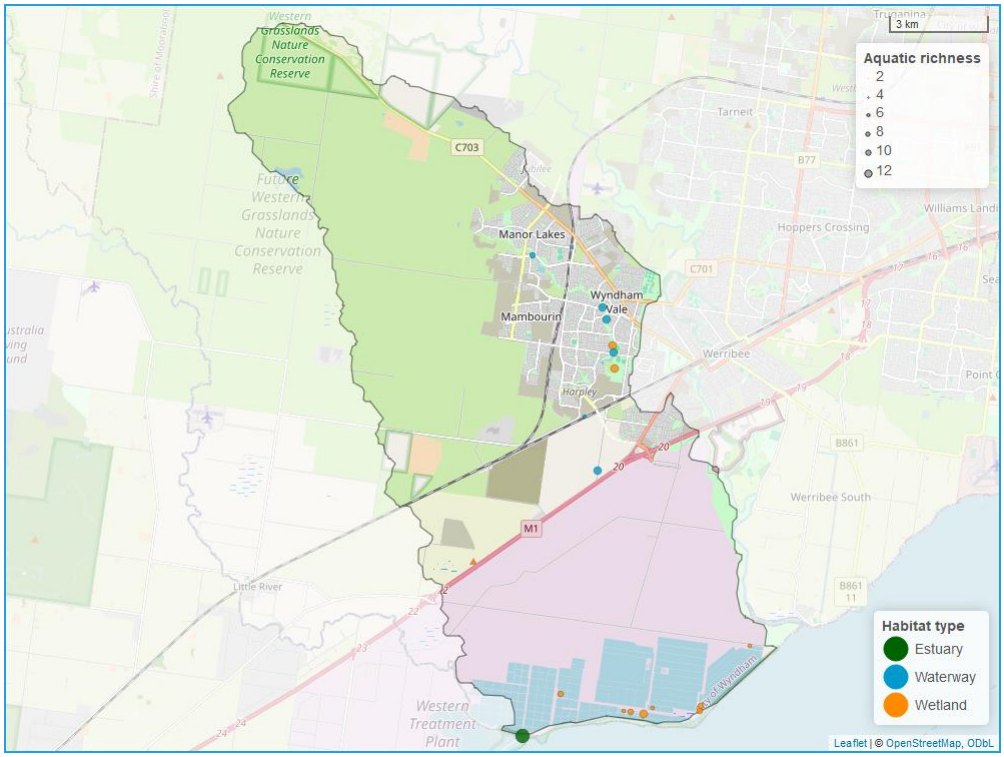

Fig. A36. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 70 samples were collected from 22 sites (Fig. A36)
- 90 taxa were detected (531 total detections); 19 were non-native and 1 were threatened

Detections

Table A36. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Cyprinus carpio* (Common carp)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Dentex sp*
Limnodynastes dumerilii (Eastern banjo frog)	*Gadopsis marmoratus* (River blackfish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Galaxias maculatus* (Common galaxias)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Litoria raniformis (Growling grass frog)	*Hyperlophus vittatus* (Sandy sprats)
Acanthogobius flavimanus (Yellowfin goby)	*Perca fluviatilis* (Redfin perch)
Acanthopagrus butcheri (Black bream)	*Philypnodon grandiceps* (Flathead gudgeon)
Aldrichetta forsteri (Yelloweye mullet)	*Pseudaphritis urvillii* (Tupong)
Anguilla australis (Short finned eel)	*Pseudogobius olorum* (Bluespot goby)
Arenigobius bifrenatus (Bridled goby)	*Retropinna semoni* (Australian smelt)
Atherinosoma microstoma (Small-mouth hardyhead)	*Tasmanogobius lasti* (Scary's tasmangoby)
Carassius auratus (Gold fish)	*Tetractenos glaber* (Smooth toadfish)

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Maribyrnong River

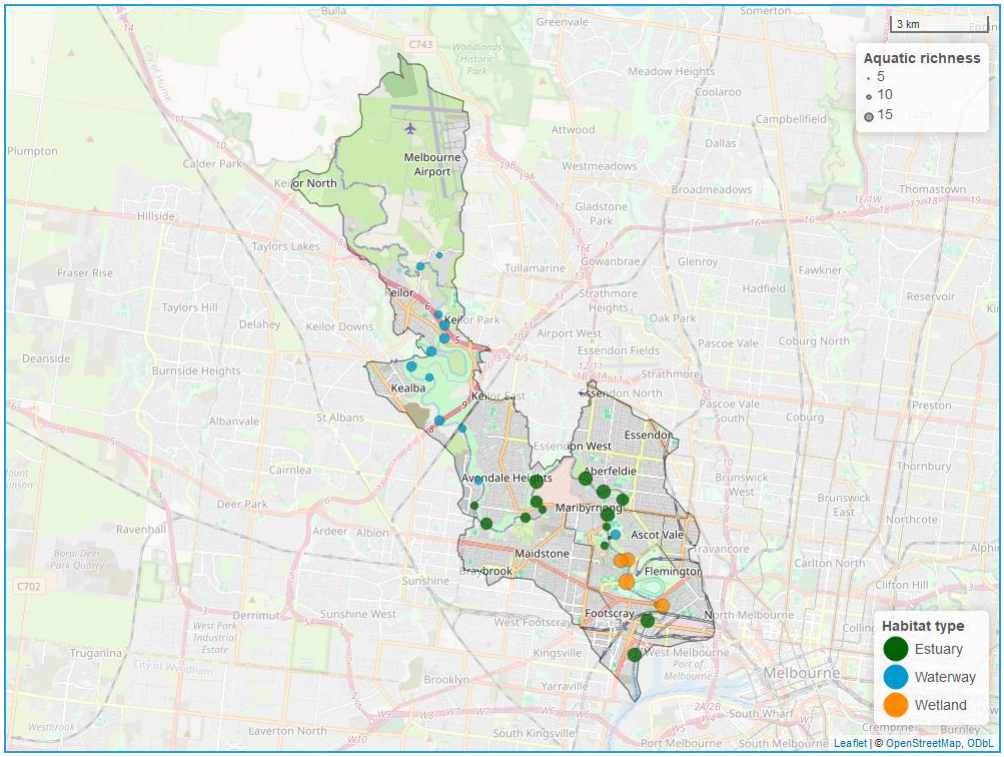

Fig. A37. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 85 samples were collected from 32 sites (Fig. A37)
- 114 taxa were detected (1,182 total detections); 28 were non-native and 2 were threatened

Detections

Table A37. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Lates calcarifer* (Barramundi)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Liza argentea* (Goldspot mullet)
Pseudophryne sp	*Macquaria colonorum* (Estuary perch)
Acanthogobius flavimanus (Yellowfin goby)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Acanthopagrus butcheri (Black bream)	*Mugil cephalus* (Sea mullet)
Acentrogobius sp	*Nannoperca australis* (Southern pygmy perch)
Afurcagobius tamarensis (Tamar goby)	*Notorynchus cepedianus* (Cowshark)
Aldrichetta forsteri (Yelloweye mullet)	*Oncorhynchus mykiss* (Rainbow trout)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Arenigobius bifrenatus (Bridled goby)	*Philypnodon grandiceps* (Flathead gudgeon)
Arenigobius frenatus (Halfbridled goby)	*Platycephalus sp*
Argyrosomus japonicus (Mulloway)	*Polyprion sp*
Atherinosoma microstoma (Small-mouth hardyhead)	*Pristiophorus nudipinnis* (Southern saw shark)
Carassius auratus (Gold fish)	*Prototroctes maraena* (Australian grayling)
Chrysophrys auratus (Snapper)	*Pseudaphritis urvillii* (Tupong)
Cyprinus carpio (Common carp)	*Pseudogobius olorum* (Bluespot goby)
Engraulis australis (Australian anchovy)	*Redigobius macrostoma* (Largemouth goby)
Galaxias brevipinnis (Climbing galaxias)	*Retropinna semoni* (Australian smelt)
Galaxias maculatus (Common galaxias)	*Rutilus rutilus* (Roach)
Galaxias ornatus (Ornate galaxias)	*Salmo trutta* (Brown trout)
Gambusia holbrooki (Mosquito fish)	*Tetractenos glaber* (Smooth toadfish)
Gobiopterus semivestitus (Glassgoby)	*Tinca tinca* (Tench)
Hyperlophus sp	*Ornithorhynchus anatinus* (Platypus)
Hyperlophus vittatus (Sandy sprats)	

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Merri Creek Lower

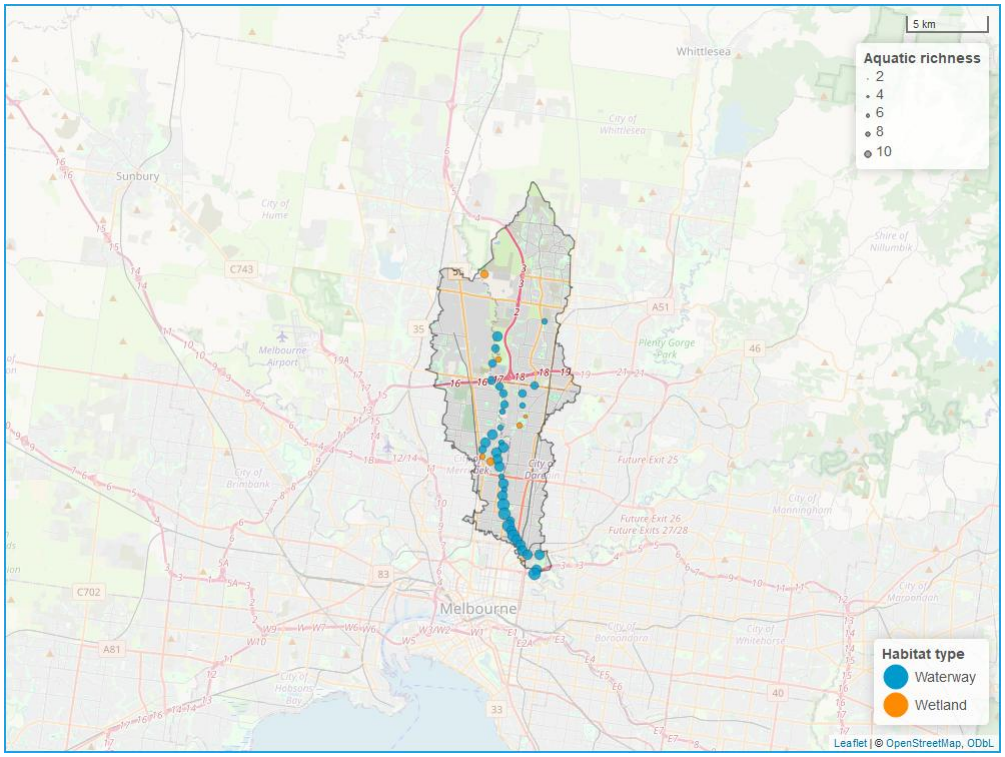

Fig. A38. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 93 samples were collected from 44 sites (Fig. A38)
- 103 taxa were detected (1,676 total detections); 26 were non-native and 3 were threatened

Detections

Table A38. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias maculatus* (Common galaxias)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Hypseleotris sp*
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Lates calcarifer* (Barramundi)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Maccullochella peelii* (Murray cod)
Litoria ewingii OR Litoria verreauxii	*Macquaria ambigua* (Golden perch)
Litoria peronii (Peron's tree frog)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria raniformis (Growling grass frog)	*Perca fluviatilis* (Redfin perch)
Neobatrachus sudelli (Sudell's frog (common spadefoot toad))	*Philypnodon grandiceps* (Flathead gudgeon)
Anguilla australis (Short finned eel)	*Retropinna semoni* (Australian smelt)
Carassius auratus (Gold fish)	*Rutilus rutilus* (Roach)
Cyprinus carpio (Common carp)	*Salmo trutta* (Brown trout)
Galaxias brevipinnis (Climbing galaxias)	*Ornithorhynchus anatinus* (Platypus)

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Merri Creek Upper

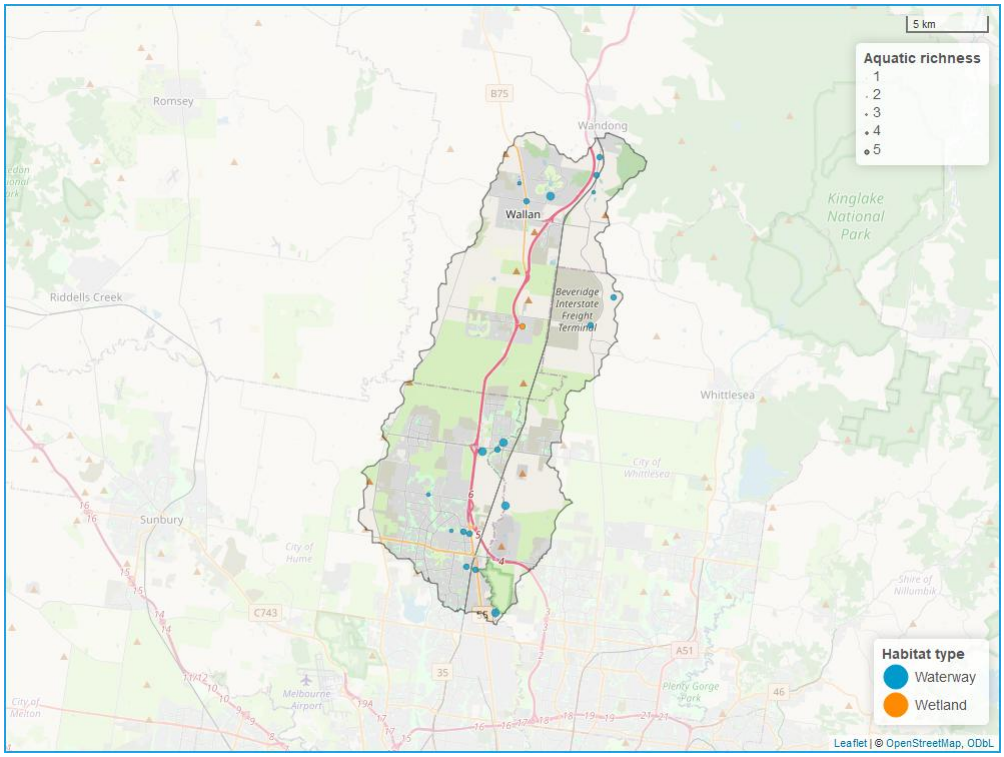

Fig. A39. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 45 samples were collected from 23 sites (Fig. A39)
- 79 taxa were detected (491 total detections); 24 were non-native and 1 were threatened

Detections

Table A39. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias brevipinnis* (Climbing galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Galaxias maculatus* (Common galaxias)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Litoria ewingii OR Litoria verreauxii	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria raniformis (Growling grass frog)	*Nannoperca australis* (Southern pygmy perch)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Carassius auratus (Gold fish)	*Philypnodon grandiceps* (Flathead gudgeon)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Gadopsis marmoratus (River blackfish)	*Rutilus rutilus* (Roach)

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Moonee Ponds Creek

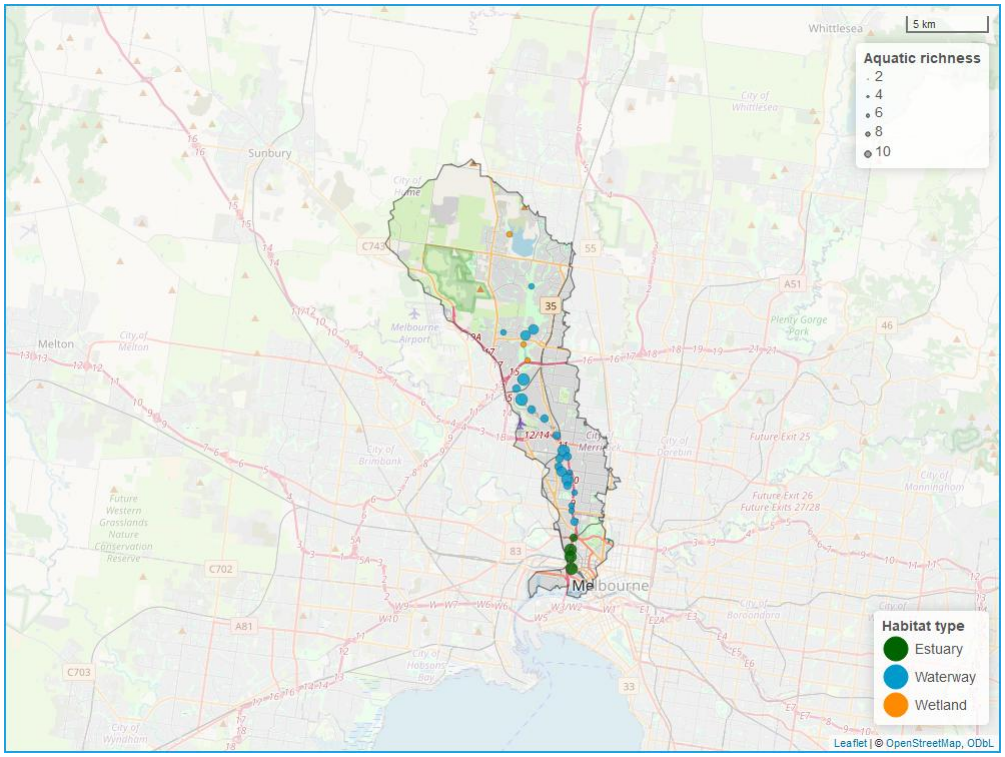

Fig. A40. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 62 samples were collected from 31 sites (Fig. A40)
- 112 taxa were detected (1,128 total detections); 27 were non-native and 1 were threatened

Detections

Table A40. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia parinsignifera (Eastern sign-bearing froglet (plains froglet))	*Galaxias brevipinnis* (Climbing galaxias)
Crinia signifera (Eastern common froglet)	*Galaxias maculatus* (Common galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Galaxias truttaceus* (Spotted galaxias)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Gobiopterus semivestitus* (Glassgoby)
Litoria ewingii OR Litoria verreauxii	*Liza argentea* (Goldspot mullet)
Litoria raniformis (Growling grass frog)	*Macquaria colonorum* (Estuary perch)
Neobatrachus sudelli (Sudell's frog (common spadefoot toad))	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Acanthogobius flavimanus (Yellowfin goby)	*Perca fluviatilis* (Redfin perch)
Acanthopagrus butcheri (Black bream)	*Philypnodon grandiceps* (Flathead gudgeon)
Afurcagobius tamarensis (Tamar goby)	*Pseudaphritis urvillii* (Tupong)
Aldrichetta forsteri (Yelloweye mullet)	*Pseudogobius olorum* (Bluespot goby)
Anguilla australis (Short finned eel)	*Retropinna semoni* (Australian smelt)
Arenigobius frenatus (Halfbridled goby)	*Rutilus rutilus* (Roach)
Carassius auratus (Gold fish)	*Thunnus sp*
Chrysophrys auratus (Snapper)	*Tinca tinca* (Tench)
Cyprinus carpio (Common carp)	

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Mornington Peninsula North-Eastern Creeks

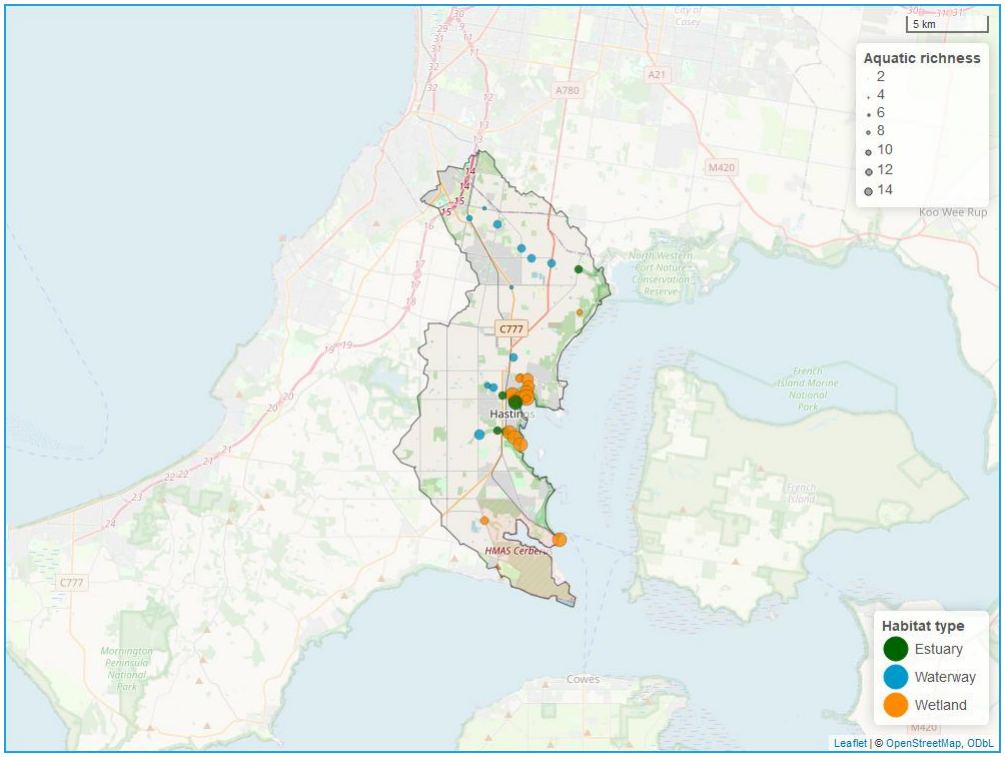

Fig. A41. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 75 samples were collected from 34 sites (Fig. A41)
- 115 taxa were detected (990 total detections); 22 were non-native and 1 were threatened

Detections

Table A41. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Girella tricuspidata* (Luderick)
Limnodynastes dumerilii (Eastern banjo frog)	*Girella zebra* (Zebra fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Gobiopterus semivestitus* (Glassgoby)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Heteroclinus sp*
Litoria ewingii OR Litoria verreauxii	*Hyperlophus vittatus* (Sandy sprats)
Acanthaluteres sp	*Hypseleotris sp*
Acanthopagrus butcheri (Black bream)	*Liza argentea* (Goldspot mullet)
Afurcagobius tamarensis (Tamar goby)	*Macquaria colonorum* (Estuary perch)
Aldrichetta forsteri (Yelloweye mullet)	*Meuschenia trachylepis* (Yellowfin leatherjacket)
Ammotretis rostratus (Longsnout flounder)	*Mugil cephalus* (Sea mullet)
Anguilla australis (Short finned eel)	*Mugilogobius platynotus* (Pale mangrove goby)
Arenigobius bifrenatus (Bridled goby)	*Nannoperca australis* (Southern pygmy perch)
Arenigobius frenatus (Halfbridled goby)	*Notorynchus cepedianus* (Cowshark)
Atherinosoma microstoma (Small-mouth hardyhead)	*Parargyrops sp*
Carassius auratus (Gold fish)	*Platycephalus sp*
Chrysophrys auratus (Snapper)	*Pseudaphritis urvillii* (Tupong)
Cyprinus carpio (Common carp)	*Pseudogobius olorum* (Bluespot goby)
Dasyatis thetidis (Cow stingray)	*Salmo trutta* (Brown trout)
Galaxias brevipinnis (Climbing galaxias)	*Sillaginodes punctatus* (King george whiting)
Galaxias maculatus (Common galaxias)	*Stigmatopora nigra* (Widebody pipefish)
Galaxias truttaceus (Spotted galaxias)	*Tetractenos glaber* (Smooth toadfish)
Gambusia holbrooki (Mosquito fish)	*Thunnus albacares* (Yellowfin tuna)

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Mornington Peninsula South-Eastern Creeks

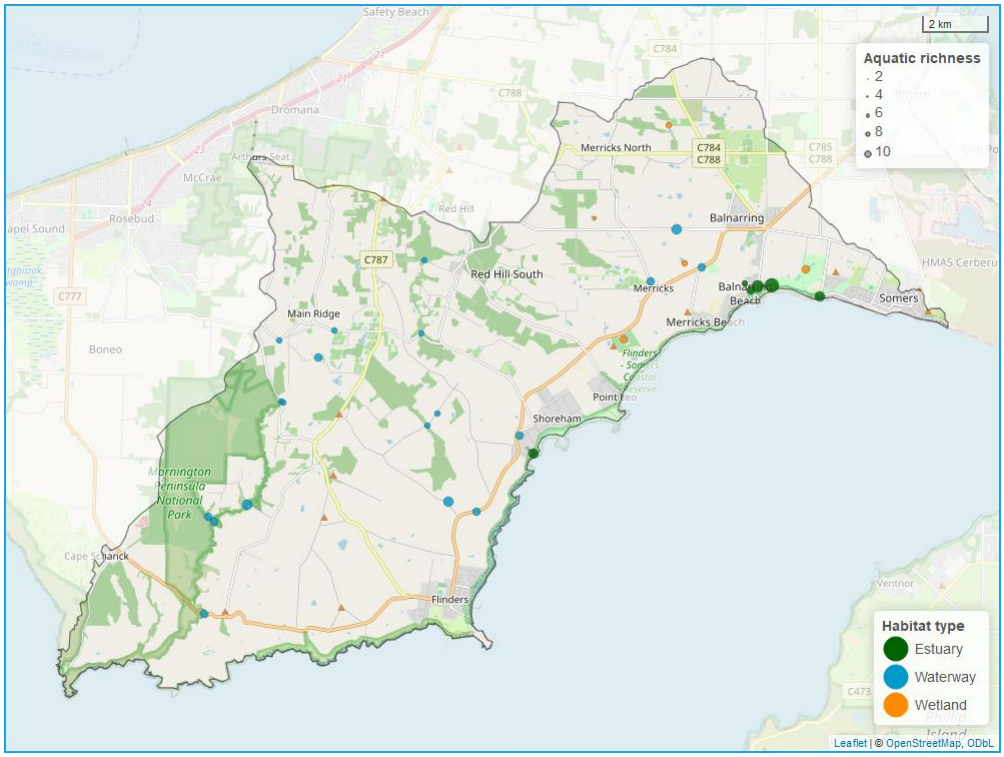

Fig. A42. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 81 samples were collected from 32 sites (Fig. A42)
- 101 taxa were detected (828 total detections); 21 were non-native and 2 were threatened

Detections

Table A42. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Geotria australis* (Pouched lamprey)
Litoria ewingii OR Litoria verreauxii	*Liza argentea* (Goldspot mullet)
Acanthaluteres sp	*Macquaria ambigua* (Golden perch)
Acanthopagrus butcheri (Black bream)	*Macquaria colonorum* (Estuary perch)
Afurcagobius tamarensis (Tamar goby)	*Mugil cephalus* (Sea mullet)
Aldrichetta forsteri (Yelloweye mullet)	*Mugilogobius platynotus* (Pale mangrove goby)
Anguilla australis (Short finned eel)	*Nannoperca australis* (Southern pygmy perch)
Arenigobius bifrenatus (Bridled goby)	*Neoodax balteatus* (Little weed whiting)
Arenigobius frenatus (Halfbridled goby)	*Oncorhynchus mykiss* (Rainbow trout)
Bidyanus bidyanus (Silver perch)	*Perca fluviatilis* (Redfin perch)
Cyprinus carpio (Common carp)	*Pseudaphritis urvillii* (Tupong)
Diodon nicthemerus (Globefish)	*Pseudogobius olorum* (Bluespot goby)
Galaxias brevipinnis (Climbing galaxias)	*Salmo trutta* (Brown trout)
Galaxias maculatus (Common galaxias)	*Tetractenos glaber* (Smooth toadfish)
Galaxias truttaceus (Spotted galaxias)	

Mornington Peninsula Western Creeks

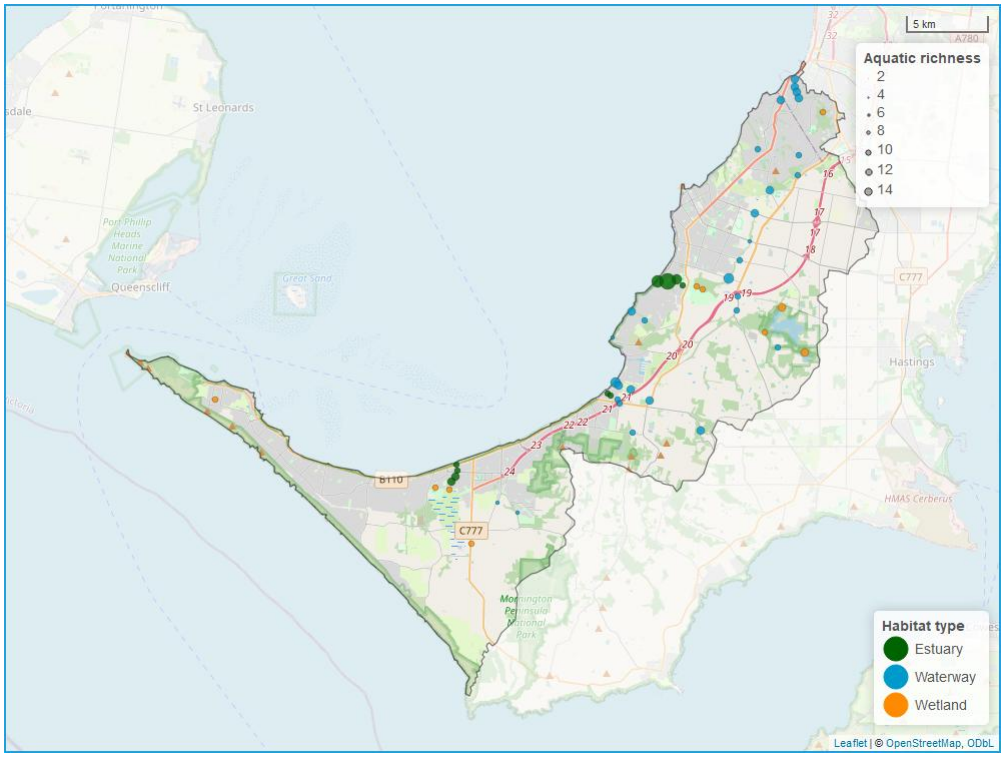

Fig. A43. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 109 samples were collected from 55 sites (Fig. A43)
- 122 taxa were detected (1,045 total detections); 26 were non-native and 3 were threatened

Detections

Table A43. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias brevipinnis* (Climbing galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Galaxias maculatus* (Common galaxias)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Galaxias truttaceus* (Spotted galaxias)
Limnodynastes sp	*Galaxiella pusilla* (Dwarf galaxias)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Litoria ewingii OR Litoria verreauxii	*Macquaria colonorum* (Estuary perch)
Litoria sp	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Acanthopagrus butcheri (Black bream)	*Nannoperca australis* (Southern pygmy perch)
Afurcagobius tamarensis (Tamar goby)	*Neochanna cleaveri* (Australian mudfish)
Aldrichetta forsteri (Yelloweye mullet)	*Oncorhynchus mykiss* (Rainbow trout)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Arenigobius bifrenatus (Bridled goby)	*Philypnodon grandiceps* (Flathead gudgeon)
Arenigobius frenatus (Halfbridled goby)	*Pseudaphritis urvillii* (Tupong)
Atherinosoma microstoma (Small-mouth hardyhead)	*Pseudogobius olorum* (Bluespot goby)
Bidyanus bidyanus (Silver perch)	*Salmo trutta* (Brown trout)
Carassius auratus (Gold fish)	*Tetractenos glaber* (Smooth toadfish)
Cyprinus carpio (Common carp)	*Tinca tinca* (Tench)
Epigonus sp	

Mullum Mullum Creek

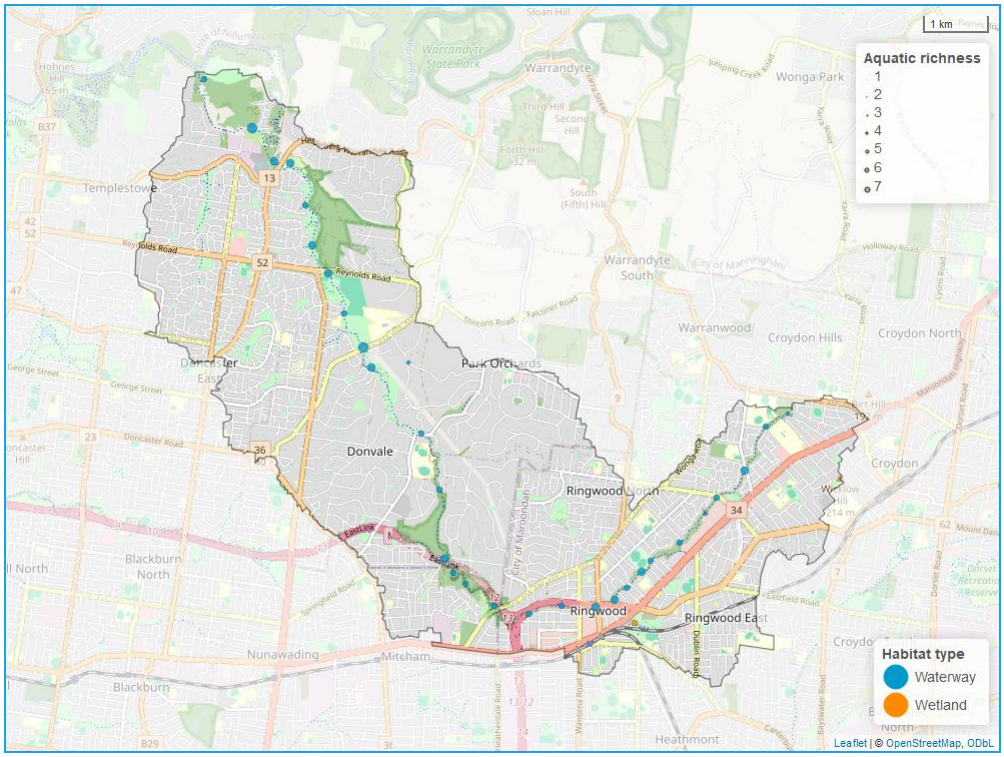

Fig. A44. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 71 samples were collected from 32 sites (Fig. A44)
- 96 taxa were detected (937 total detections); 25 were non-native and 1 were threatened

Detections

Table A44. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias ornatus* (Ornate galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Macquaria ambigua* (Golden perch)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria ewingii OR Litoria verreauxii	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Retropinna semoni* (Australian smelt)
Cyprinus carpio (Common carp)	*Rutilus rutilus* (Roach)
Gadopsis marmoratus (River blackfish)	*Salmo trutta* (Brown trout)
Galaxias brevipinnis (Climbing galaxias)	*Ornithorhynchus anatinus* (Platypus)
Galaxias maculatus (Common galaxias)	

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Olinda Creek

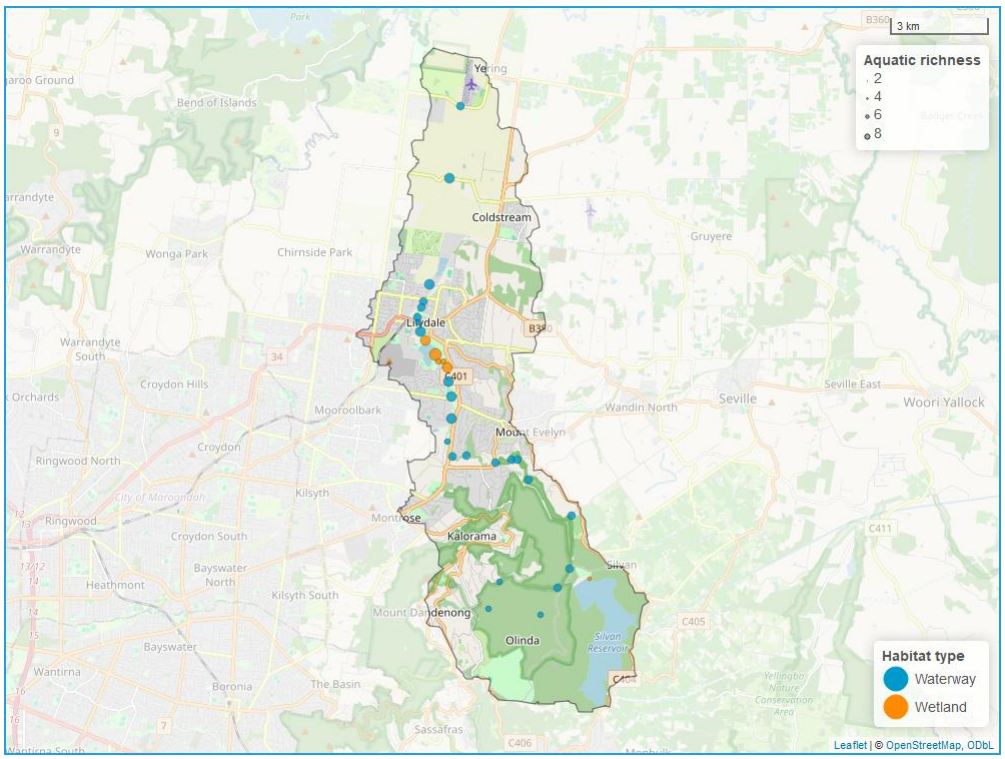

Fig. A45. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 78 samples were collected from 30 sites (Fig. A45)
- 111 taxa were detected (1,015 total detections); 26 were non-native and 2 were threatened

Detections

Table A45. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias maculatus* (Common galaxias)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Galaxias ornatus* (Ornate galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Hypseleotris sp*
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Macquaria ambigua* (Golden perch)
Litoria ewingii OR Litoria verreauxii	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria fallax (Eastern dwarf tree frog)	*Nannoperca australis* (Southern pygmy perch)
Litoria peronii (Peron's tree frog)	*Oncorhynchus mykiss* (Rainbow trout)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Bidyanus bidyanus (Silver perch)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Retropinna semoni* (Australian smelt)
Cyprinus carpio (Common carp)	*Rutilus rutilus* (Roach)
Gadopsis marmoratus (River blackfish)	*Salmo trutta* (Brown trout)
Galaxias brevipinnis (Climbing galaxias)	*Ornithorhynchus anatinus* (Platypus)

Parwan Creek

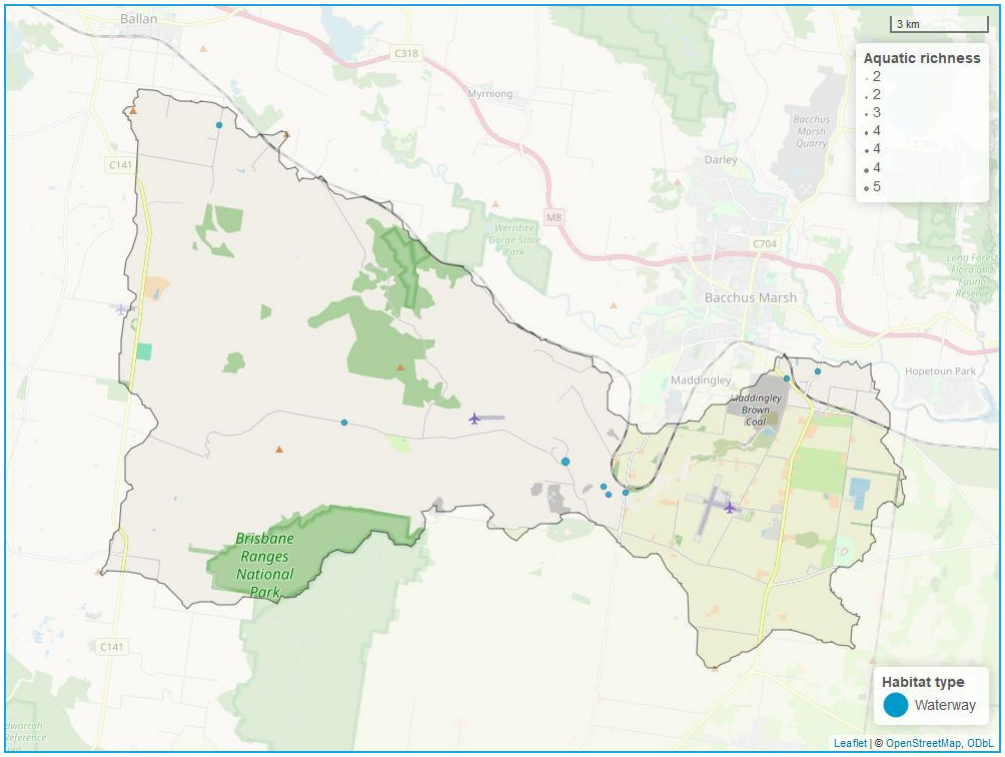

Fig. A46. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 16 samples were collected from 9 sites (Fig. A46)
- 53 taxa were detected (124 total detections); 15 were non-native and 1 were threatened

Detections

Table A46. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Carassius auratus* (Gold fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Cyprinus carpio* (Common carp)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Galaxias maculatus* (Common galaxias)
Litoria ewingii OR Litoria verreauxii	*Perca fluviatilis* (Redfin perch)
Litoria raniformis (Growling grass frog)	*Philypnodon grandiceps* (Flathead gudgeon)
Anguilla australis (Short finned eel)	*Rutilus rutilus* (Roach)

Plenty River (Source)

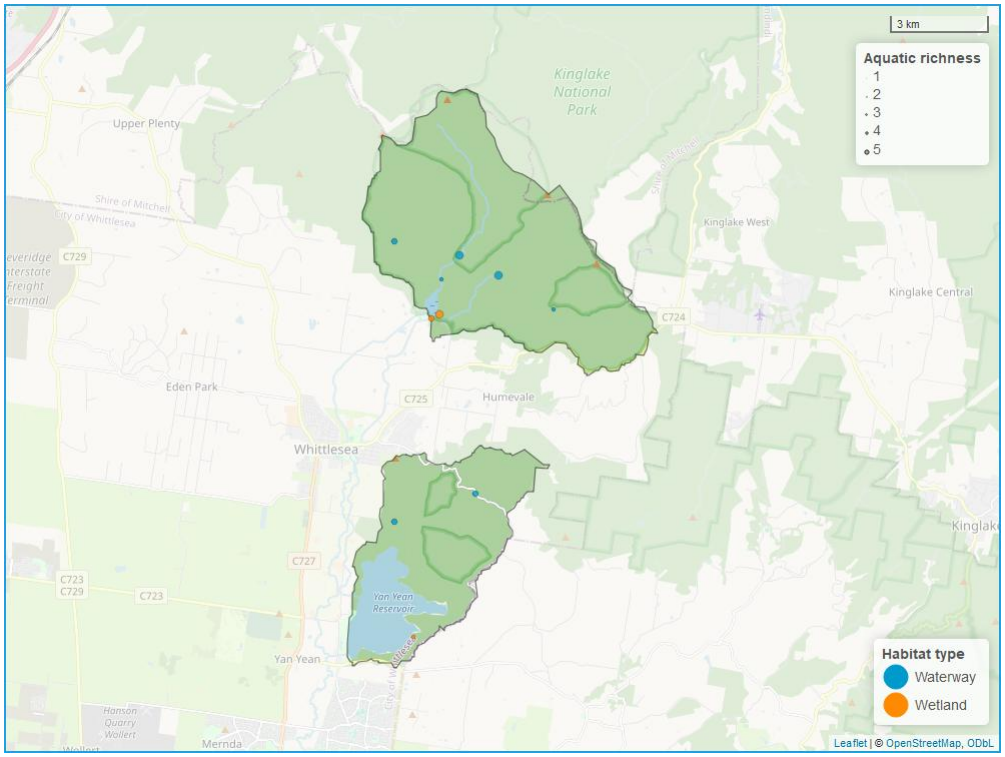

Fig. A47. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 29 samples were collected from 11 sites (Fig. A47)
- 75 taxa were detected (256 total detections); 18 were non-native and 1 were threatened

Detections

Table A47. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia parinsignifera (Eastern sign-bearing froglet (plains froglet))	*Galaxias brevipinnis* (Climbing galaxias)
Crinia signifera (Eastern common froglet)	*Galaxias maculatus* (Common galaxias)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Galaxias ornatus* (Ornate galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Nannoperca australis* (Southern pygmy perch)
Litoria ewingii OR Litoria verreauxii	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Rutilus rutilus* (Roach)
Cyprinus carpio (Common carp)	*Salmo trutta* (Brown trout)
Gadopsis marmoratus (River blackfish)	*Ornithorhynchus anatinus* (Platypus)

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Plenty River Lower

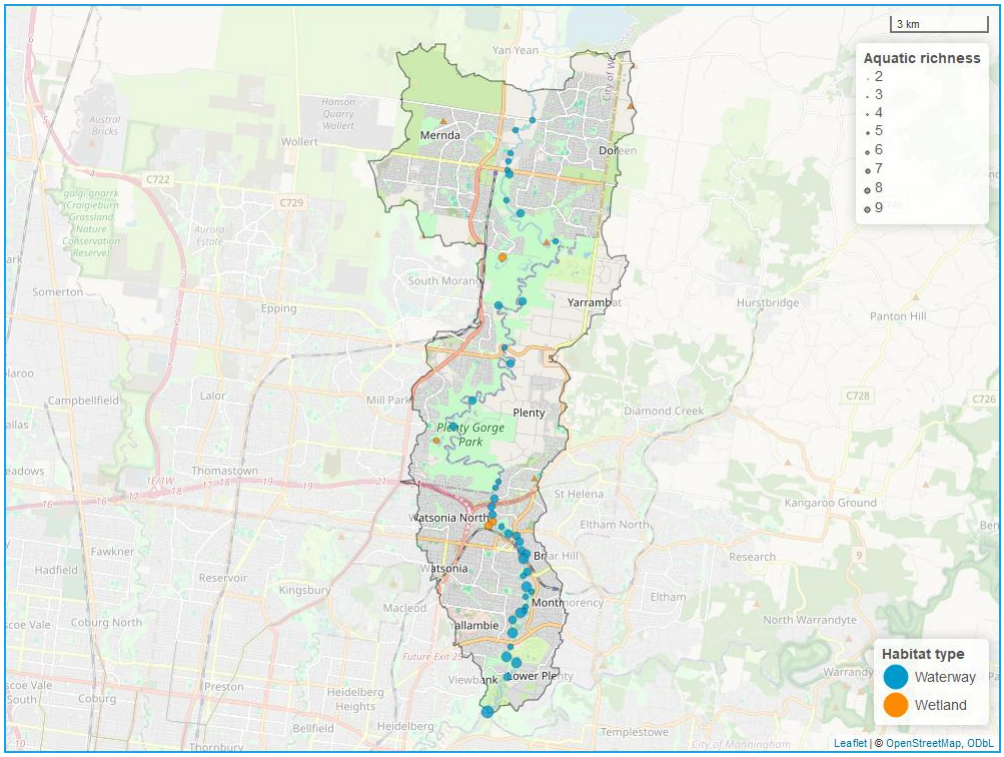

Fig. A48. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 95 samples were collected from 46 sites (Fig. A48)
- 106 taxa were detected (1,589 total detections); 30 were non-native and 3 were threatened

Detections

Table A48. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Hypseleotris sp*
Limnodynastes dumerilii (Eastern banjo frog)	*Maccullochella peelii* (Murray cod)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Macquaria ambigua* (Golden perch)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Macquaria australasica* (Macquarie perch)
Litoria ewingii OR Litoria verreauxii	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria peronii (Peron's tree frog)	*Nannoperca australis* (Southern pygmy perch)
Neobatrachus sudelli (Sudell's frog (common spadefoot toad))	*Oncorhynchus mykiss* (Rainbow trout)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Carassius auratus (Gold fish)	*Philypnodon grandiceps* (Flathead gudgeon)
Chrysophrys auratus (Snapper)	*Pseudaphritis urvillii* (Tupong)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Galaxias brevipinnis (Climbing galaxias)	*Rutilus rutilus* (Roach)
Galaxias maculatus (Common galaxias)	*Salmo trutta* (Brown trout)
Galaxias ornatus (Ornate galaxias)	*Tinca tinca* (Tench)
Gambusia holbrooki (Mosquito fish)	*Ornithorhynchus anatinus* (Platypus)

Plenty River Upper

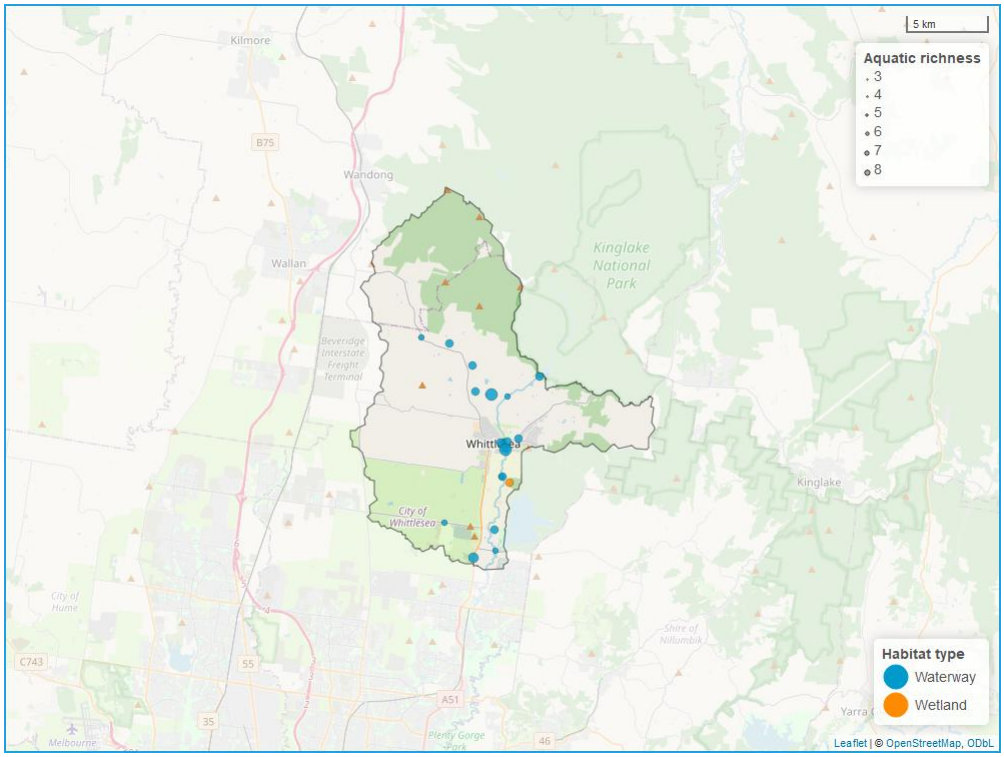

Fig. A49. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 64 samples were collected from 20 sites (Fig. A49)
- 90 taxa were detected (860 total detections); 27 were non-native and 2 were threatened

Detections

Table A49. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Hypseleotris sp*
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Maccullochella peelii* (Murray cod)
Limnodynastes dumerilii (Eastern banjo frog)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Nannoperca australis* (Southern pygmy perch)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Oncorhynchus mykiss* (Rainbow trout)
Litoria ewingii OR Litoria verreauxii	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Pseudaphritis urvillii* (Tupong)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Galaxias maculatus (Common galaxias)	*Rutilus rutilus* (Roach)
Galaxias ornatus (Ornate galaxias)	*Salmo trutta* (Brown trout)
Gambusia holbrooki (Mosquito fish)	*Ornithorhynchus anatinus* (Platypus)

Skeleton Creek

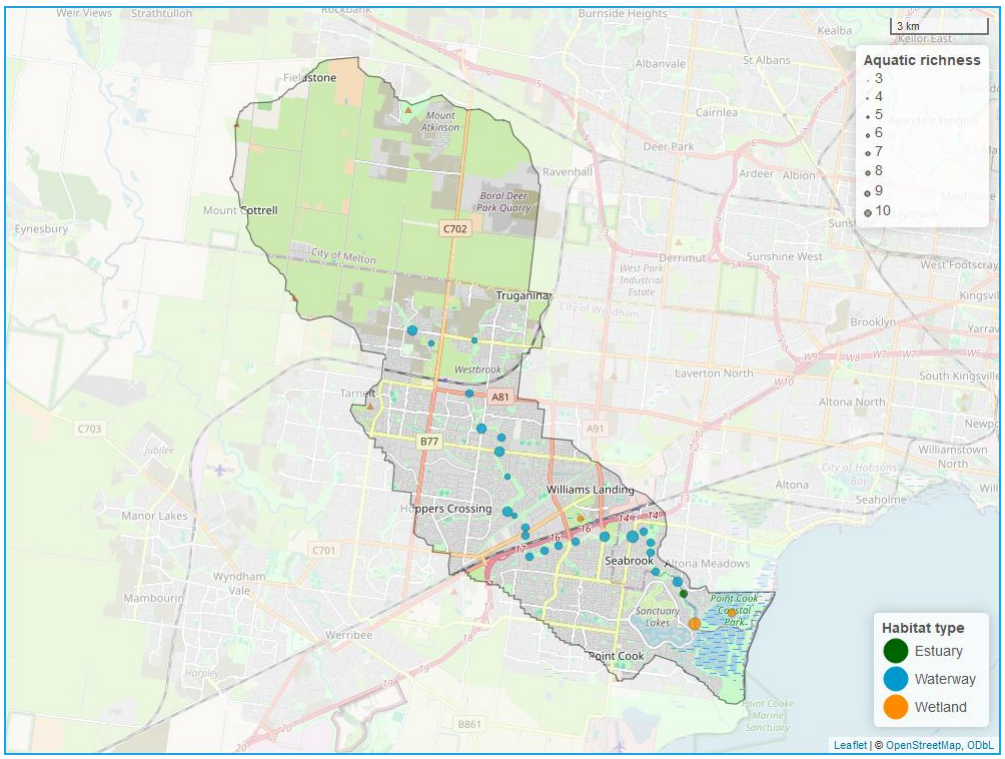

Fig. A50. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 68 samples were collected from 27 sites (Fig. A50)
- 91 taxa were detected (855 total detections); 25 were non-native and 1 were threatened

Detections

Table A50. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Atherinosoma microstoma* (Small-mouth hardyhead)
Limnodynastes dumerilii (Eastern banjo frog)	*Carassius auratus* (Gold fish)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Cyprinus carpio* (Common carp)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Emmelichthys sp*
Litoria raniformis (Growling grass frog)	*Galaxias maculatus* (Common galaxias)
Neobatrachus sudelli (Sudell's frog (common spadefoot toad))	*Gambusia holbrooki* (Mosquito fish)
Acanthopagrus butcheri (Black bream)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Afurcagobius tamarensis (Tamar goby)	*Philypnodon grandiceps* (Flathead gudgeon)
Aldrichetta forsteri (Yelloweye mullet)	*Pseudaphritis urvillii* (Tupong)
Anguilla australis (Short finned eel)	*Pseudogobius olorum* (Bluespot goby)
Arenigobius bifrenatus (Bridled goby)	*Rutilus rutilus* (Roach)
Arenigobius frenatus (Halfbridled goby)	

Steele Creek

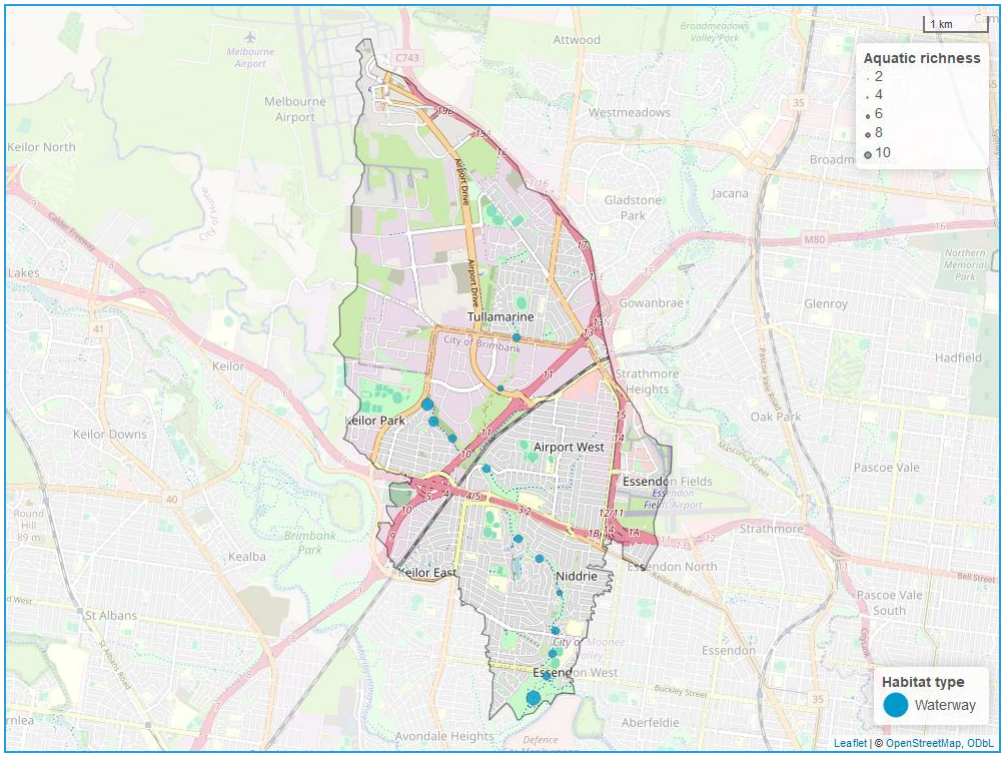

Fig. A51. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 39 samples were collected from 13 sites (Fig. A51)
- 80 aquatic taxa were detected (462 total detections), including 23 non-native species

Detections

Table A51. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Gobiopterus semivestitus* (Glassgoby)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Lates calcarifer* (Barramundi)
Acanthogobius flavimanus (Yellowfin goby)	*Macquaria colonorum* (Estuary perch)
Acanthopagrus butcheri (Black bream)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Afurcagobius tamarensis (Tamar goby)	*Philypnodon grandiceps* (Flathead gudgeon)
Aldrichetta forsteri (Yelloweye mullet)	*Pseudaphritis urvillii* (Tupong)
Anguilla australis (Short finned eel)	*Pseudogobius olorum* (Bluespot goby)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Galaxias brevipinnis (Climbing galaxias)	*Salmo trutta* (Brown trout)
Galaxias maculatus (Common galaxias)	*Tinca tinca* (Tench)
Galaxias truttaceus (Spotted galaxias)	

Steels and Pauls Creek (Rural)

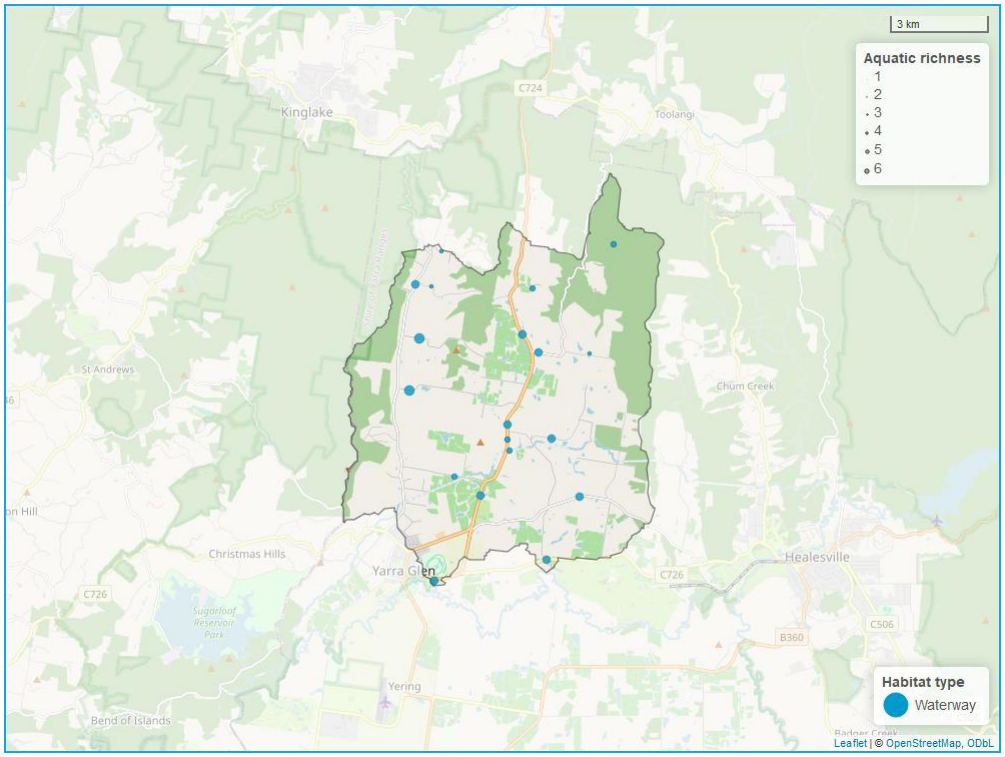

Fig. A52. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 71 samples were collected from 21 sites (Fig. A52)
- 93 taxa were detected (772 total detections); 26 were non-native and 1 were threatened

Detections

Table A52. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Hypseleotris sp*
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Nannoperca australis* (Southern pygmy perch)
Litoria ewingii OR Litoria verreauxii	*Oncorhynchus mykiss* (Rainbow trout)
Litoria raniformis (Growling grass frog)	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Retropinna semoni* (Australian smelt)
Cyprinus carpio (Common carp)	*Rutilus rutilus* (Roach)
Galaxias brevipinnis (Climbing galaxias)	*Salmo trutta* (Brown trout)
Galaxias maculatus (Common galaxias)	*Tinca tinca* (Tench)
Galaxias ornatus (Ornate galaxias)	

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Steels and Pauls Creek (Source)

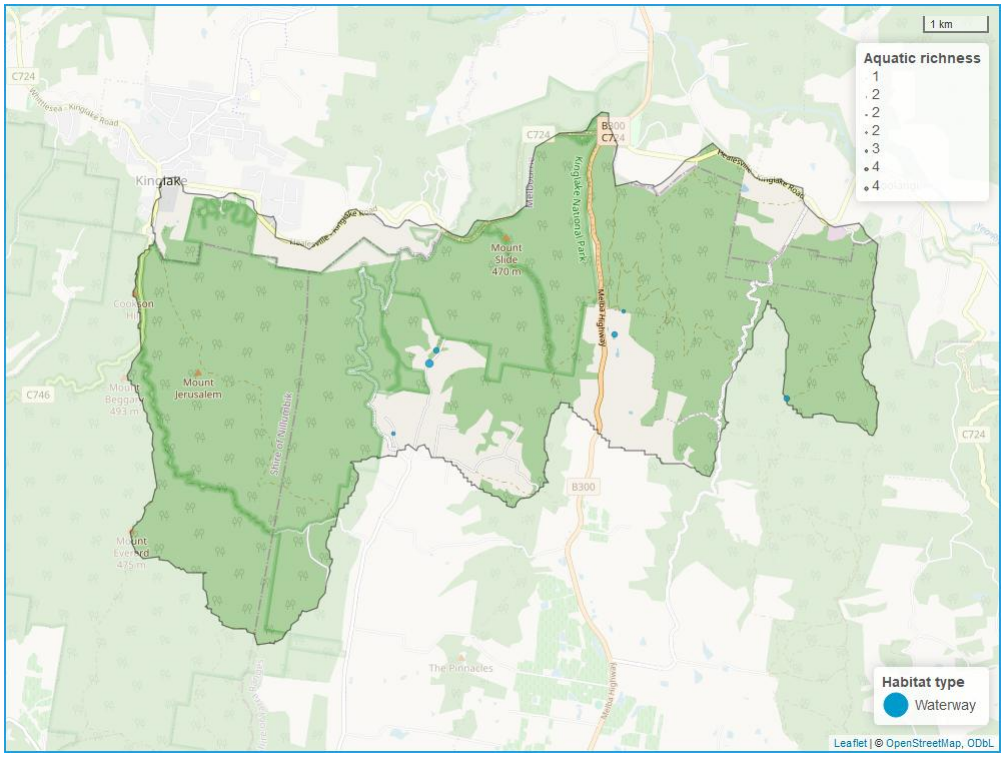

Fig. A53. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 11 samples were collected from 7 sites (Fig. A53)
- 32 aquatic taxa were detected (75 total detections), including 9 non-native species

Detections

Table A53. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Carassius auratus* (Gold fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Galaxias ornatus* (Ornate galaxias)
Litoria ewingii OR Litoria verreauxii	*Macquaria ambigua* (Golden perch)
Anguilla australis (Short finned eel)	

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Stony Creek

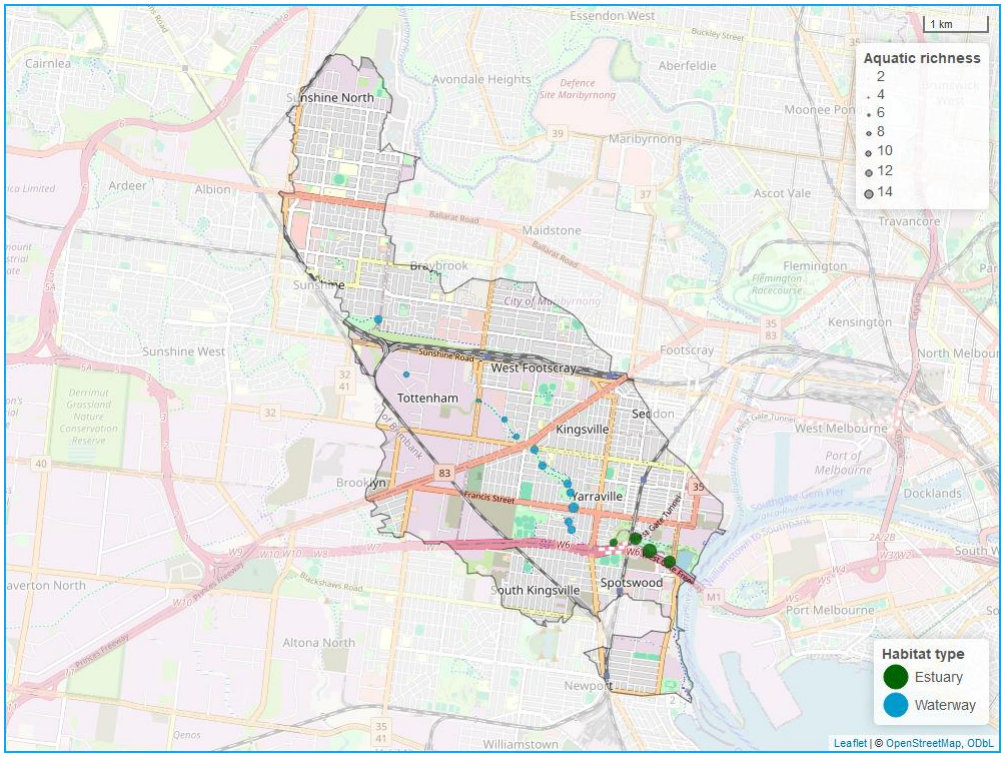

Fig. A54. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 45 samples were collected from 16 sites (Fig. A54)
- 88 aquatic taxa were detected (577 total detections), including 23 non-native species

Detections

Table A54. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias brevipinnis* (Climbing galaxias)
Limnodynastes dumerilii (Eastern banjo frog)	*Galaxias maculatus* (Common galaxias)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Galaxias truttaceus* (Spotted galaxias)
Litoria ewingii OR Litoria verreauxii	*Gambusia holbrooki* (Mosquito fish)
Litoria lesueurii (Lesueur's frog (rocky river frog))	*Gobiopterus semivestitus* (Glassgoby)
Acanthogobius flavimanus (Yellowfin goby)	*Lates calcarifer* (Barramundi)
Acanthopagrus butcheri (Black bream)	*Liza argentea* (Goldspot mullet)
Afurcagobius tamarensis (Tamar goby)	*Macquaria colonorum* (Estuary perch)
Aldrichetta forsteri (Yelloweye mullet)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Arenigobius bifrenatus (Bridled goby)	*Pseudogobius olorum* (Bluespot goby)
Arenigobius frenatus (Halfbridled goby)	*Retropinna semoni* (Australian smelt)
Atherinosoma microstoma (Small-mouth hardyhead)	*Rhombosolea tapirina* (Greenback flounder)
Carassius auratus (Gold fish)	*Rutilus rutilus* (Roach)
Chrysophrys auratus (Snapper)	*Siganus sp*
Cyprinus carpio (Common carp)	*Tinca tinca* (Tench)

Stringybark Creek

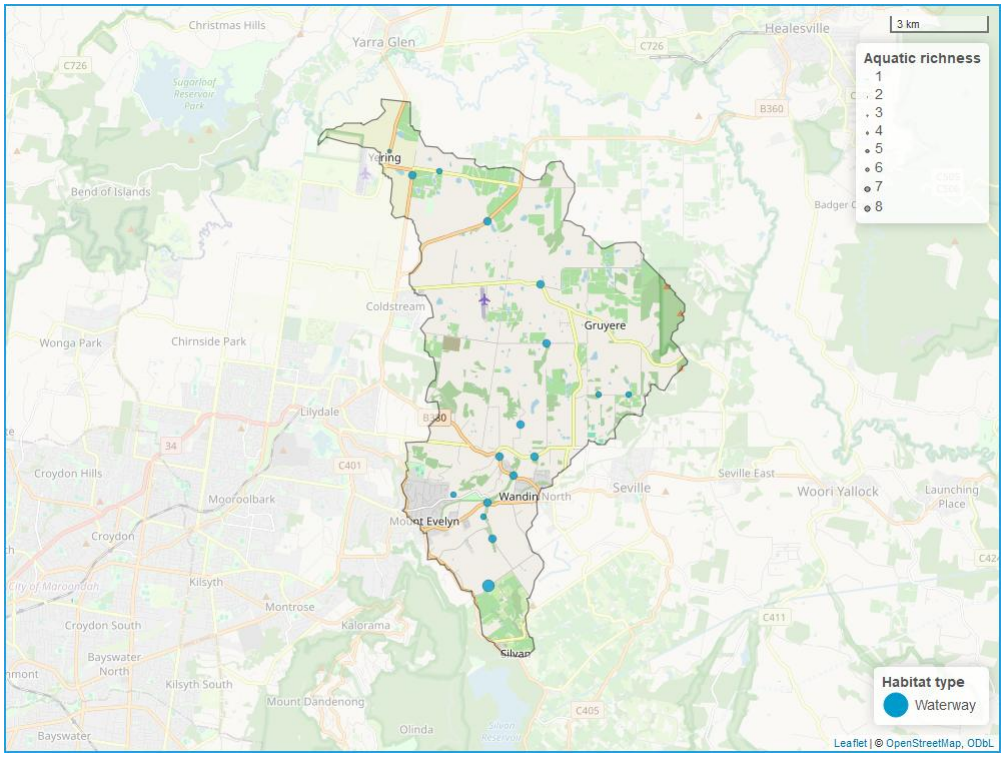

Fig. A55. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 49 samples were collected from 17 sites (Fig. A55)
- 72 taxa were detected (509 total detections); 26 were non-native and 1 were threatened

Detections

Table A55. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Macquaria ambigua* (Golden perch)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Nannoperca australis* (Southern pygmy perch)
Litoria peronii (Peron's tree frog)	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Retropinna semoni* (Australian smelt)
Cyprinus carpio (Common carp)	*Rutilus rutilus* (Roach)
Gadopsis marmoratus (River blackfish)	*Salmo trutta* (Brown trout)
Galaxias maculatus (Common galaxias)	*Ornithorhynchus anatinus* (Platypus)
Galaxias ornatus (Ornate galaxias)	

Tarago River

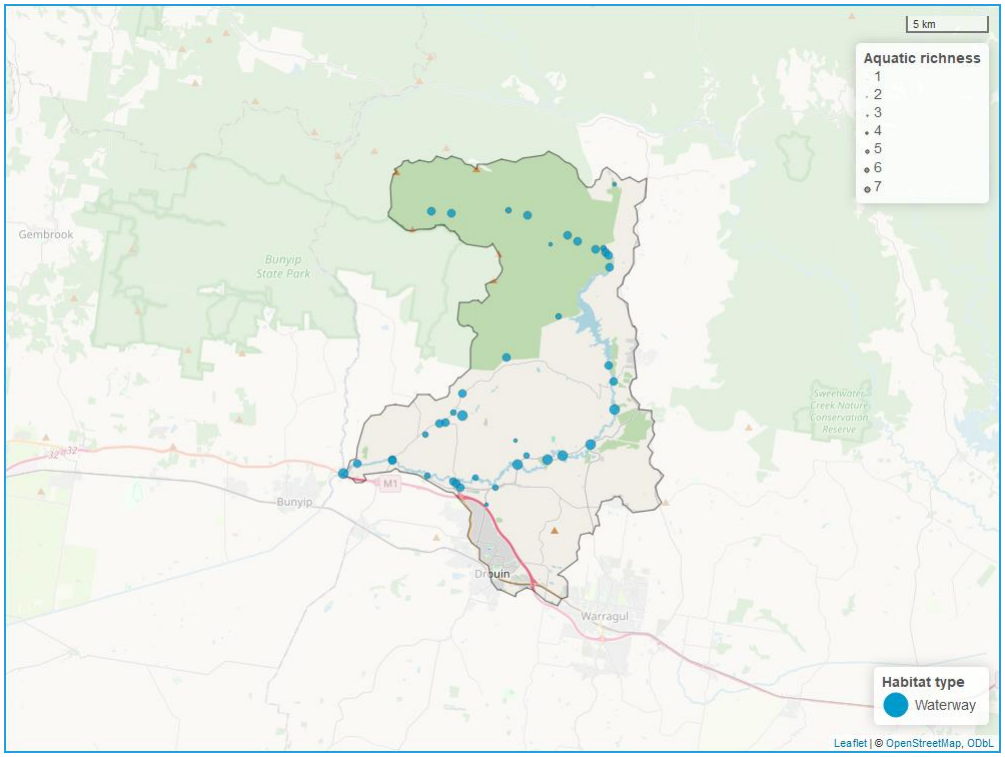

Fig. A56. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 77 samples were collected from 45 sites (Fig. A56)
- 88 taxa were detected (847 total detections); 22 were non-native and 2 were threatened

Detections

Table A56. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias ornatus* (Ornate galaxias)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Litoria ewingii OR Litoria verreauxii	*Nannoperca australis* (Southern pygmy perch)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Anguilla reinhardtii (Longfin eel)	*Prototroctes maraena* (Australian grayling)
Carassius auratus (Gold fish)	*Pseudaphritis urvillii* (Tupong)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Gadopsis marmoratus (River blackfish)	*Salmo trutta* (Brown trout)
Galaxias brevipinnis (Climbing galaxias)	*Ornithorhynchus anatinus* (Platypus)
Galaxias maculatus (Common galaxias)	

Taylors Creek

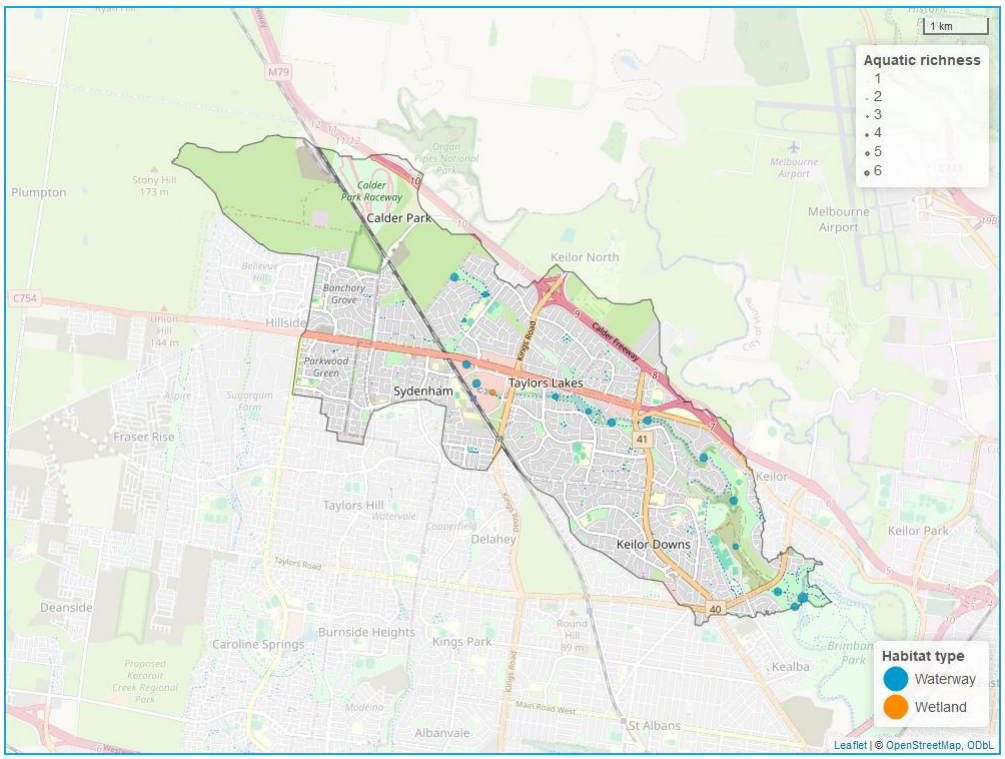

Fig. A57. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 44 samples were collected from 16 sites (Fig. A57)
- 77 taxa were detected (621 total detections); 23 were non-native and 1 were threatened

Detections

Table A57. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Macquaria colonorum* (Estuary perch)
Limnodynastes dumerilii (Eastern banjo frog)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Nannoperca australis* (Southern pygmy perch)
Litoria peronii (Peron's tree frog)	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Pseudaphritis urvillii* (Tupong)
Chrysophrys auratus (Snapper)	*Retropinna semoni* (Australian smelt)
Cyprinus carpio (Common carp)	*Rutilus rutilus* (Roach)
Galaxias maculatus (Common galaxias)	*Tinca tinca* (Tench)
Galaxias truttaceus (Spotted galaxias)	*Ornithorhynchus anatinus* (Platypus)
Gambusia holbrooki (Mosquito fish)	

Toolern Creek

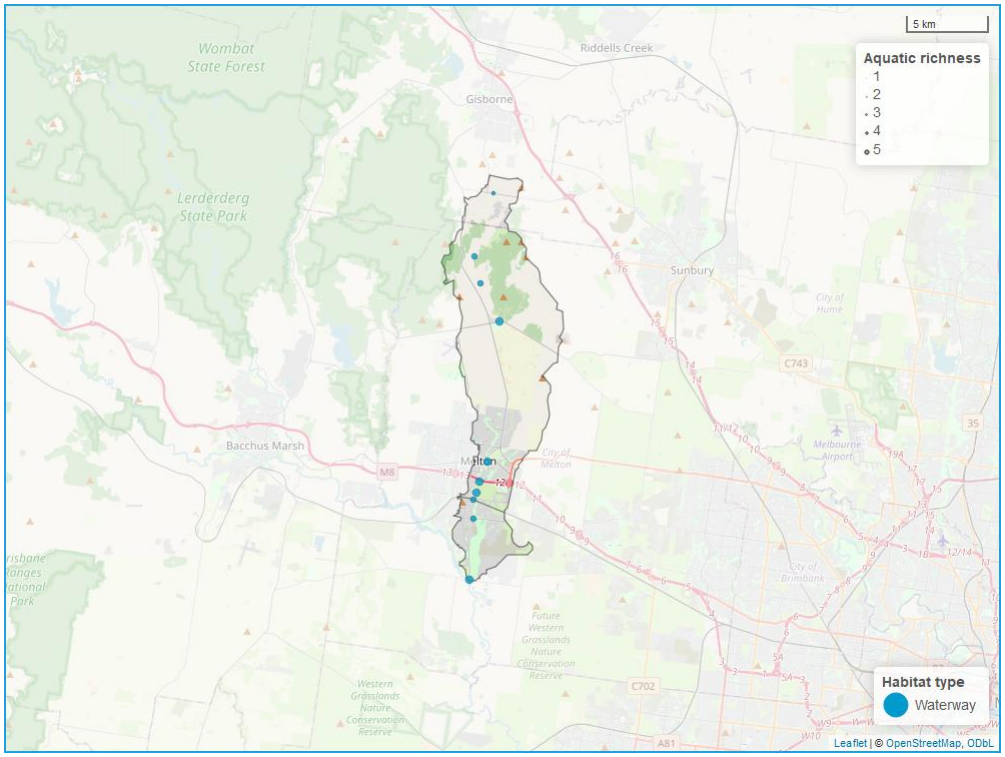

Fig. A58. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 27 samples were collected from 10 sites (Fig. A58)
- 64 taxa were detected (242 total detections); 22 were non-native and 1 were threatened

Detections

Table A58. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Oncorhynchus mykiss* (Rainbow trout)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Retropinna semoni* (Australian smelt)
Cyprinus carpio (Common carp)	*Rutilus rutilus* (Roach)
Galaxias brevipinnis (Climbing galaxias)	*Salmo trutta* (Brown trout)
Galaxias maculatus (Common galaxias)	*Ornithorhynchus anatinus* (Platypus)

Watsons Creek

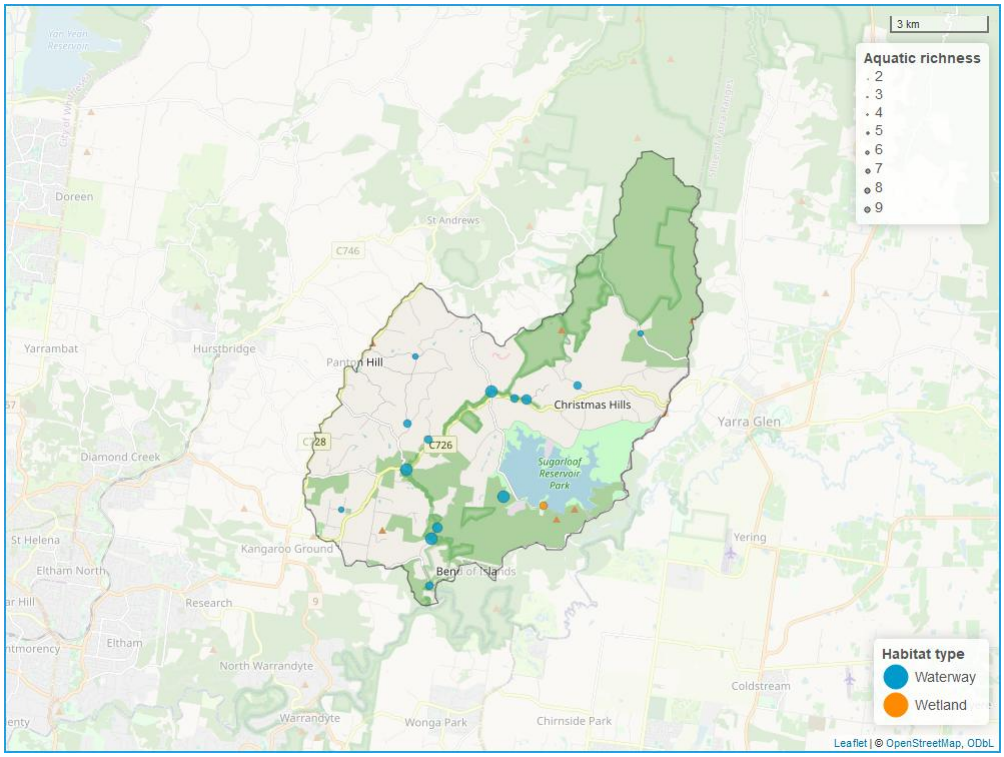

Fig. A59. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 48 samples were collected from 17 sites (Fig. A59)
- 84 taxa were detected (524 total detections); 23 were non-native and 1 were threatened

Detections

Table A59. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias truttaceus* (Spotted galaxias)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Hypseleotris sp*
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Macquaria ambigua* (Golden perch)
Litoria ewingii OR Litoria verreauxii	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria peronii (Peron's tree frog)	*Nannoperca australis* (Southern pygmy perch)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Cyprinus carpio (Common carp)	*Philypnodon grandiceps* (Flathead gudgeon)
Gadopsis marmoratus (River blackfish)	*Retropinna semoni* (Australian smelt)
Galaxias brevipinnis (Climbing galaxias)	*Rutilus rutilus* (Roach)
Galaxias maculatus (Common galaxias)	*Salmo trutta* (Brown trout)
Galaxias ornatus (Ornate galaxias)	*Ornithorhynchus anatinus* (Platypus)

Watts River (Rural)

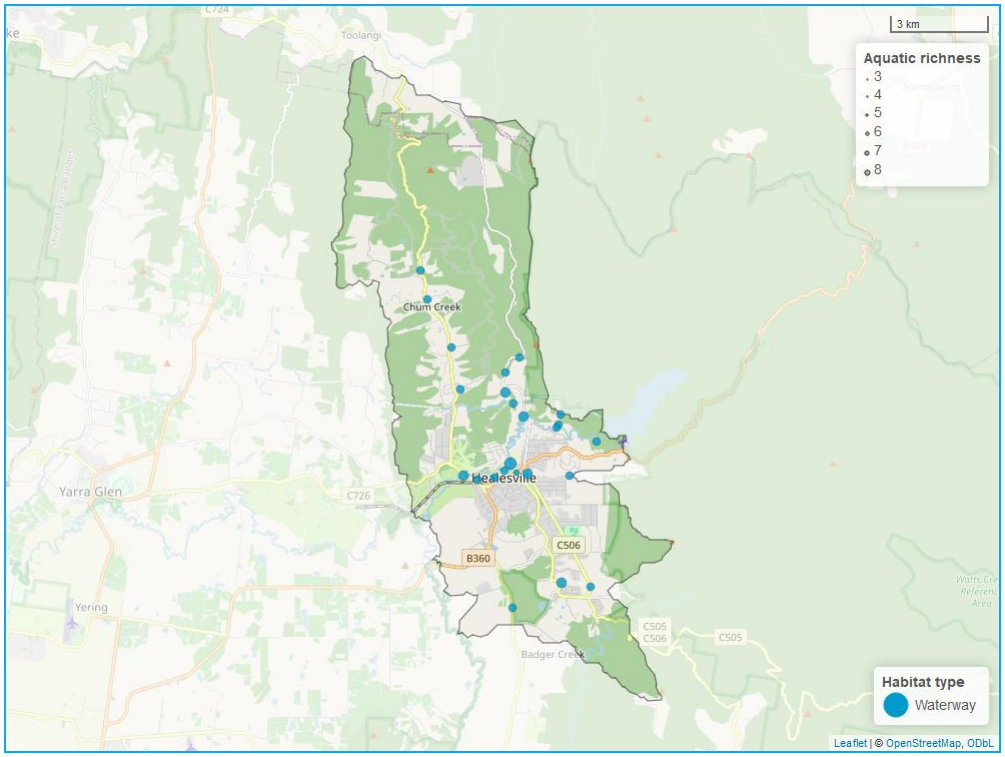

Fig. A60. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 49 samples were collected from 24 sites (Fig. A60)
- 92 taxa were detected (651 total detections); 23 were non-native and 2 were threatened

Detections

Table A60. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Geotria australis* (Pouched lamprey)
Limnodynastes dumerilii (Eastern banjo frog)	*Hypseleotris sp*
Litoria ewingii OR Litoria verreauxii	*Macquaria australasica* (Macquarie perch)
Litoria peronii (Peron's tree frog)	*Nannoperca australis* (Southern pygmy perch)
Anguilla australis (Short finned eel)	*Oncorhynchus mykiss* (Rainbow trout)
Carassius auratus (Gold fish)	*Perca fluviatilis* (Redfin perch)
Cyprinus carpio (Common carp)	*Philypnodon grandiceps* (Flathead gudgeon)
Gadopsis marmoratus (River blackfish)	*Retropinna semoni* (Australian smelt)
Galaxias brevipinnis (Climbing galaxias)	*Rutilus rutilus* (Roach)
Galaxias maculatus (Common galaxias)	*Salmo trutta* (Brown trout)
Galaxias ornatus (Ornate galaxias)	*Salvelinus fontinalis* (Brook trout)
Galaxias truttaceus (Spotted galaxias)	*Tinca tinca* (Tench)
Gambusia holbrooki (Mosquito fish)	*Ornithorhynchus anatinus* (Platypus)

Watts River (Source)

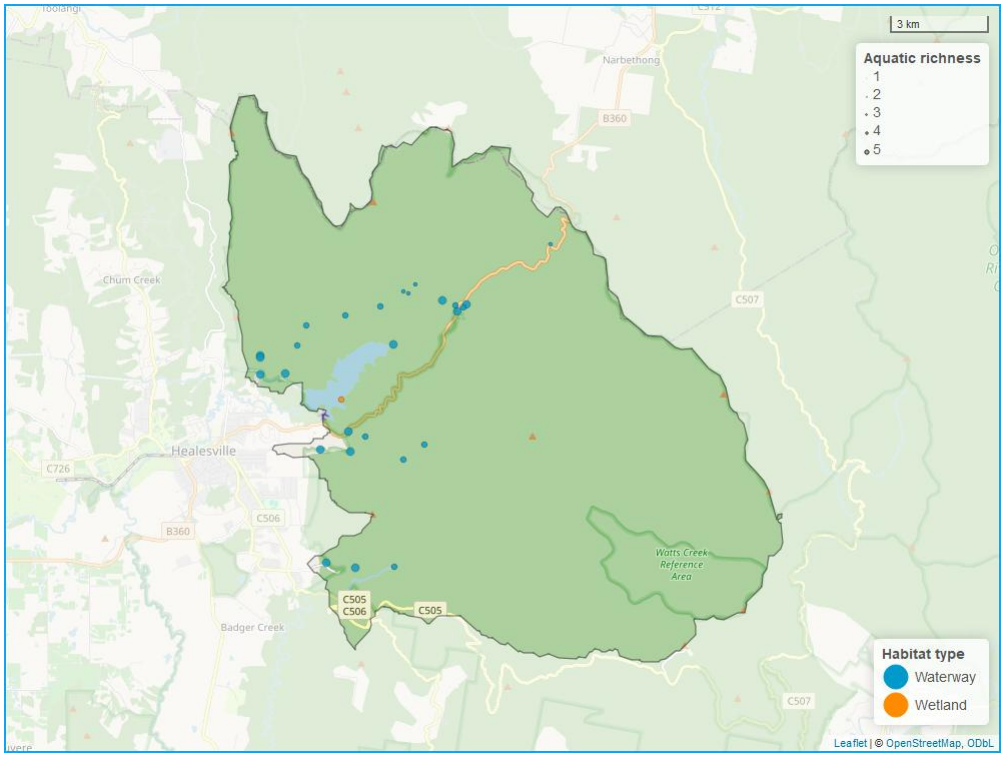

Fig. A61. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 76 samples were collected from 29 sites (Fig. A61)
- 67 taxa were detected (520 total detections); 14 were non-native and 1 were threatened

Detections

Table A61. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Limnodynastes dumerilii (Eastern banjo frog)	*Galaxias truttaceus* (Spotted galaxias)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Gambusia holbrooki* (Mosquito fish)
Anguilla australis (Short finned eel)	*Nannoperca australis* (Southern pygmy perch)
Cyprinus carpio (Common carp)	*Oncorhynchus mykiss* (Rainbow trout)
Gadopsis marmoratus (River blackfish)	*Perca fluviatilis* (Redfin perch)
Galaxias brevipinnis (Climbing galaxias)	*Salmo trutta* (Brown trout)
Galaxias maculatus (Common galaxias)	*Ornithorhynchus anatinus* (Platypus)
Galaxias ornatus (Ornate galaxias)	

Werribee River Lower

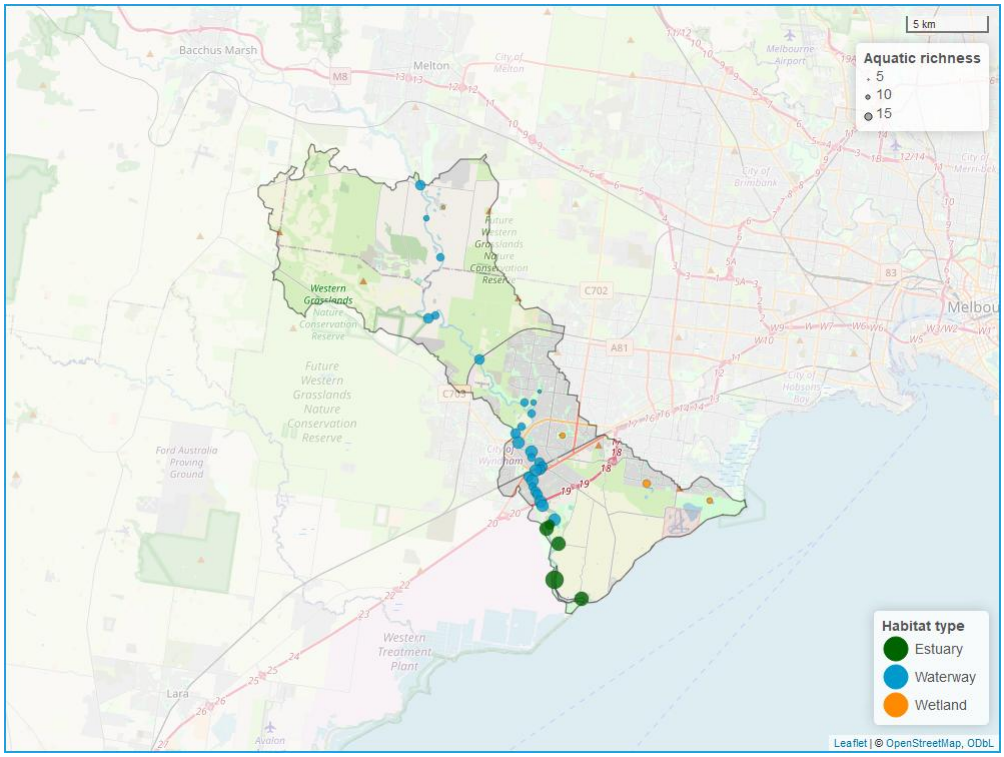

Fig. A62. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 89 samples were collected from 38 sites (Fig. A62)
- 129 taxa were detected (1,263 total detections); 27 were non-native and 3 were threatened

Detections

Table A62. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Hyperlophus vittatus* (Sandy sprats)
Limnodynastes dumerilii (Eastern banjo frog)	*Lates calcarifer* (Barramundi)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Macquaria ambigua* (Golden perch)
Litoria sp	*Macquaria colonorum* (Estuary perch)
Acanthogobius flavimanus (Yellowfin goby)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Acanthopagrus butcheri (Black bream)	*Mugil cephalus* (Sea mullet)
Afurcagobius tamarensis (Tamar goby)	*Perca fluviatilis* (Redfin perch)
Aldrichetta forsteri (Yelloweye mullet)	*Philypnodon grandiceps* (Flathead gudgeon)
Anguilla australis (Short finned eel)	*Platycephalus sp*
Arenigobius bifrenatus (Bridled goby)	*Prototroctes maraena* (Australian grayling)
Arenigobius frenatus (Halfbridled goby)	*Pseudaphritis urvillii* (Tupong)
Atherinosoma microstoma (Small-mouth hardyhead)	*Pseudogobius olorum* (Bluespot goby)
Bidyanus bidyanus (Silver perch)	*Redigobius macrostoma* (Largemouth goby)
Brachaluteres jacksonianus (Southern pygmy leatherjacket)	*Retropinna semoni* (Australian smelt)
Carassius auratus (Gold fish)	*Rhynchobatus sp*
Chrysophrys auratus (Snapper)	*Rutilus rutilus* (Roach)
Cyprinus carpio (Common carp)	*Salmo trutta* (Brown trout)
Dentex sp	*Sparidae sp*
Galaxias brevipinnis (Climbing galaxias)	*Stigmatopora nigra* (Widebody pipefish)
Galaxias maculatus (Common galaxias)	*Tasmanogobius lasti* (Scary's tasmangoby)
Gambusia holbrooki (Mosquito fish)	*Tetractenos glaber* (Smooth toadfish)
Geotria australis (Pouched lamprey)	*Tinca tinca* (Tench)
Gobiopterus semivestitus (Glassgoby)	*Ornithorhynchus anatinus* (Platypus)

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Werribee River Middle

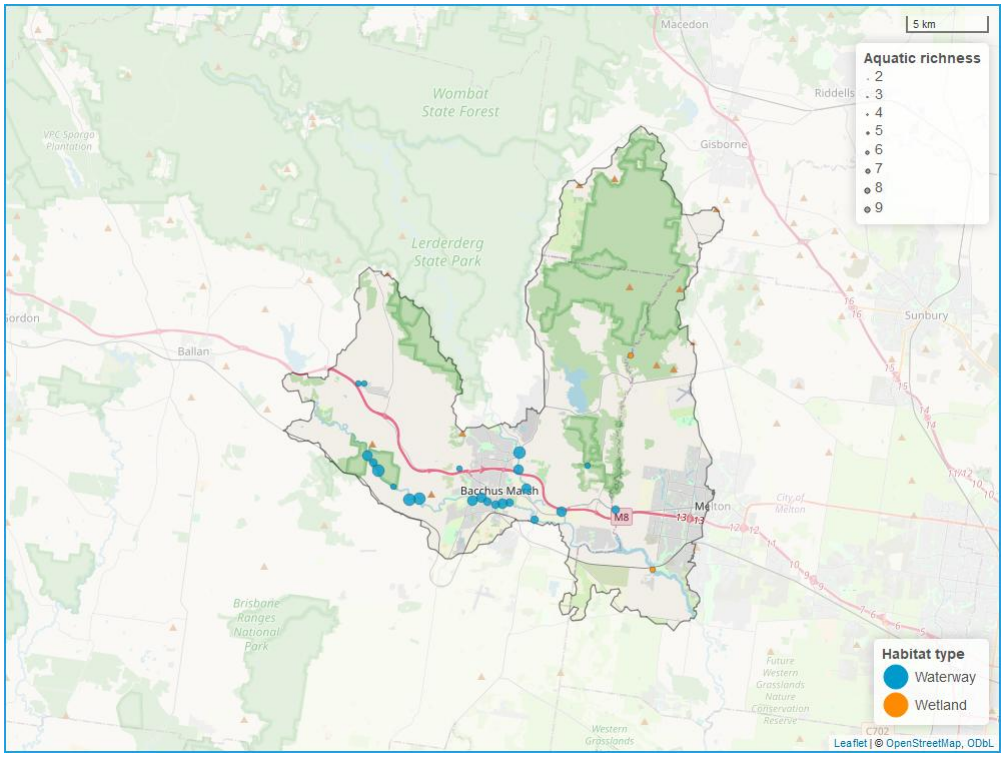

Fig. A63. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 61 samples were collected from 26 sites (Fig. A63)
- 97 taxa were detected (865 total detections); 26 were non-native and 1 were threatened

Detections

Table A63. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Macquaria ambigua* (Golden perch)
Limnodynastes dumerilii (Eastern banjo frog)	*Macquaria colonorum* (Estuary perch)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Nannoperca australis* (Southern pygmy perch)
Litoria lesueurii (Lesueur's frog (rocky river frog))	*Oncorhynchus mykiss* (Rainbow trout)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Carassius auratus (Gold fish)	*Philypnodon grandiceps* (Flathead gudgeon)
Cyprinus carpio (Common carp)	*Retropinna semoni* (Australian smelt)
Gadopsis marmoratus (River blackfish)	*Rutilus rutilus* (Roach)
Galaxias maculatus (Common galaxias)	*Salmo trutta* (Brown trout)
Galaxias ornatus (Ornate galaxias)	*Tinca tinca* (Tench)
Gambusia holbrooki (Mosquito fish)	*Ornithorhynchus anatinus* (Platypus)

Werribee River Upper

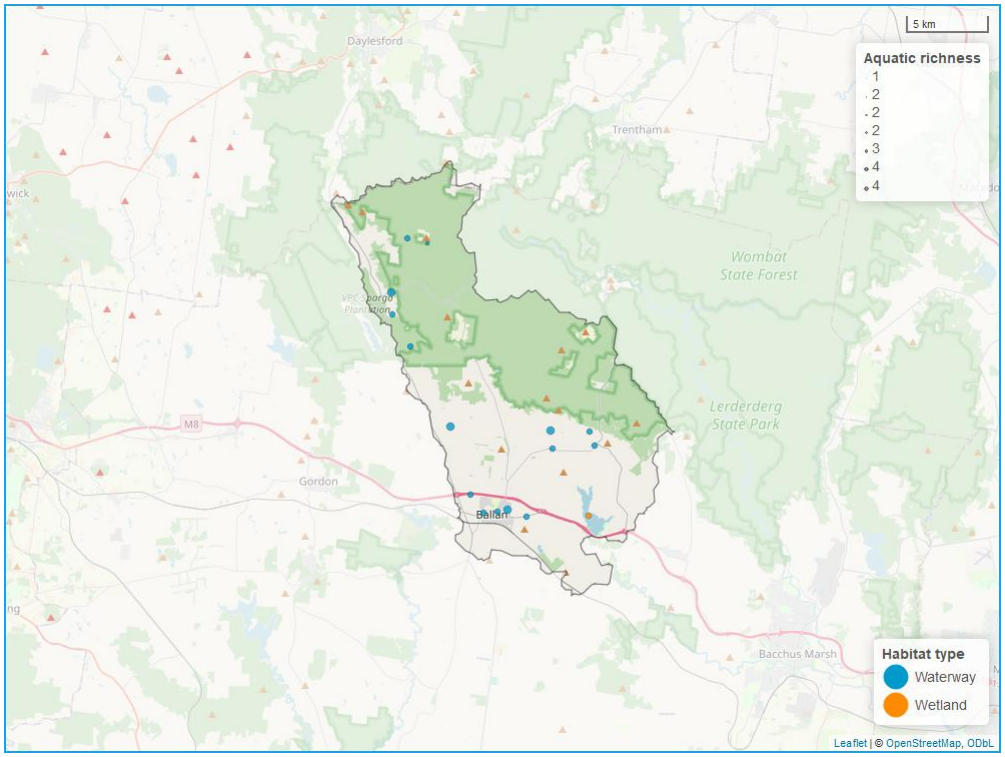

Fig. A64. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 43 samples were collected from 16 sites (Fig. A64)
- 83 aquatic taxa were detected (475 total detections), including 25 non-native species

Detections

Table A64. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Gambusia holbrooki* (Mosquito fish)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Macquaria ambigua* (Golden perch)
Limnodynastes dumerilii (Eastern banjo frog)	*Nannoperca australis* (Southern pygmy perch)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Oncorhynchus mykiss* (Rainbow trout)
Litoria ewingii OR Litoria verreauxii	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Retropinna semoni* (Australian smelt)
Cyprinus carpio (Common carp)	*Rutilus rutilus* (Roach)
Galaxias maculatus (Common galaxias)	*Salmo trutta* (Brown trout)
Galaxias ornatus (Ornate galaxias)	*Tinca tinca* (Tench)

Woori Yallock Creek

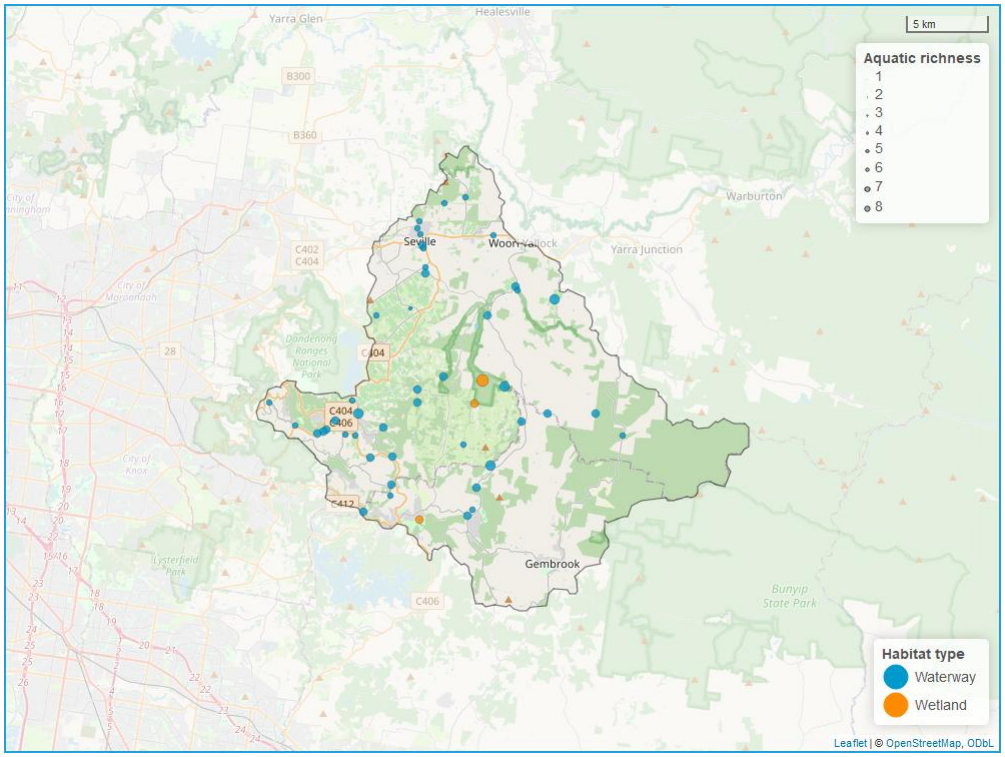

Fig. A65. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 84 samples were collected from 49 sites (Fig. A65)
- 106 taxa were detected (1,091 total detections); 30 were non-native and 1 were threatened

Detections

Table A65. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Nannoperca australis* (Southern pygmy perch)
Limnodynastes dumerilii (Eastern banjo frog)	*Oncorhynchus mykiss* (Rainbow trout)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Perca fluviatilis* (Redfin perch)
Litoria ewingii OR Litoria verreauxii	*Percichthyidae sp*
Litoria fallax (Eastern dwarf tree frog)	*Philypnodon grandiceps* (Flathead gudgeon)
Anguilla australis (Short finned eel)	*Retropinna semoni* (Australian smelt)
Carassius auratus (Gold fish)	*Rutilus rutilus* (Roach)
Cyprinus carpio (Common carp)	*Salmo salar* (Atlantic salmon)
Gadopsis marmoratus (River blackfish)	*Salmo trutta* (Brown trout)
Galaxias maculatus (Common galaxias)	*Salvelinus fontinalis* (Brook trout)
Galaxias ornatus (Ornate galaxias)	*Salvelinus sp*
Gambusia holbrooki (Mosquito fish)	*Tinca tinca* (Tench)
Macquaria colonorum (Estuary perch)	*Ornithorhynchus anatinus* (Platypus)

Yarra River Lower

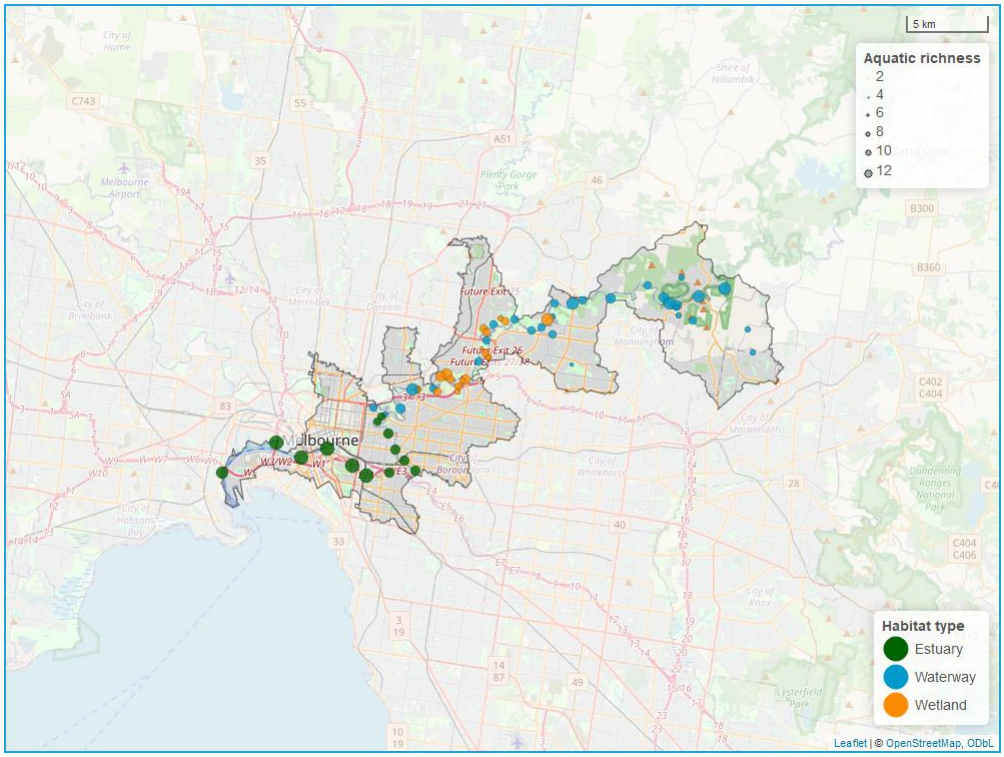

Fig. A66. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 165 samples were collected from 65 sites (Fig. A66)
- 146 taxa were detected (2,346 total detections); 31 were non-native and 3 were threatened

Detections

Table A66. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias truttaceus* (Spotted galaxias)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Gobiopterus semivestitus* (Glassgoby)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Hyperlophus vittatus* (Sandy sprats)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Hypseleotris sp*
Litoria ewingii OR Litoria verreauxii	*Liza argentea* (Goldspot mullet)
Litoria fallax (Eastern dwarf tree frog)	*Maccullochella peelii* (Murray cod)
Litoria peronii (Peron's tree frog)	*Macquaria ambigua* (Golden perch)
Litoria sp	*Macquaria australasica* (Macquarie perch)
Acanthogobius flavimanus (Yellowfin goby)	*Macquaria colonorum* (Estuary perch)
Acanthopagrus butcheri (Black bream)	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Acentrogobius pflaumii (Striped sandgoby)	*Nannoperca australis* (Southern pygmy perch)
Afurcagobius tamarensis (Tamar goby)	*Oncorhynchus mykiss* (Rainbow trout)
Aldrichetta forsteri (Yelloweye mullet)	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Arenigobius bifrenatus (Bridled goby)	*Pseudogobius olorum* (Bluespot goby)
Arenigobius frenatus (Halfbridled goby)	*Redigobius macrostoma* (Largemouth goby)
Atherinosoma microstoma (Small-mouth hardyhead)	*Retropinna semoni* (Australian smelt)
Carassius auratus (Gold fish)	*Rutilus rutilus* (Roach)
Cyprinidae sp	*Salmo trutta* (Brown trout)
Cyprinus carpio (Common carp)	*Seriola lalandi* (Yellowtail kingfish)
Gadopsis marmoratus (River blackfish)	*Sillaginodes punctatus* (King george whiting)
Galaxias brevipinnis (Climbing galaxias)	*Tetractenos glaber* (Smooth toadfish)
Galaxias maculatus (Common galaxias)	*Tinca tinca* (Tench)
Galaxias ornatus (Ornate galaxias)	*Ornithorhynchus anatinus* (Platypus)

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Yarra River Middle

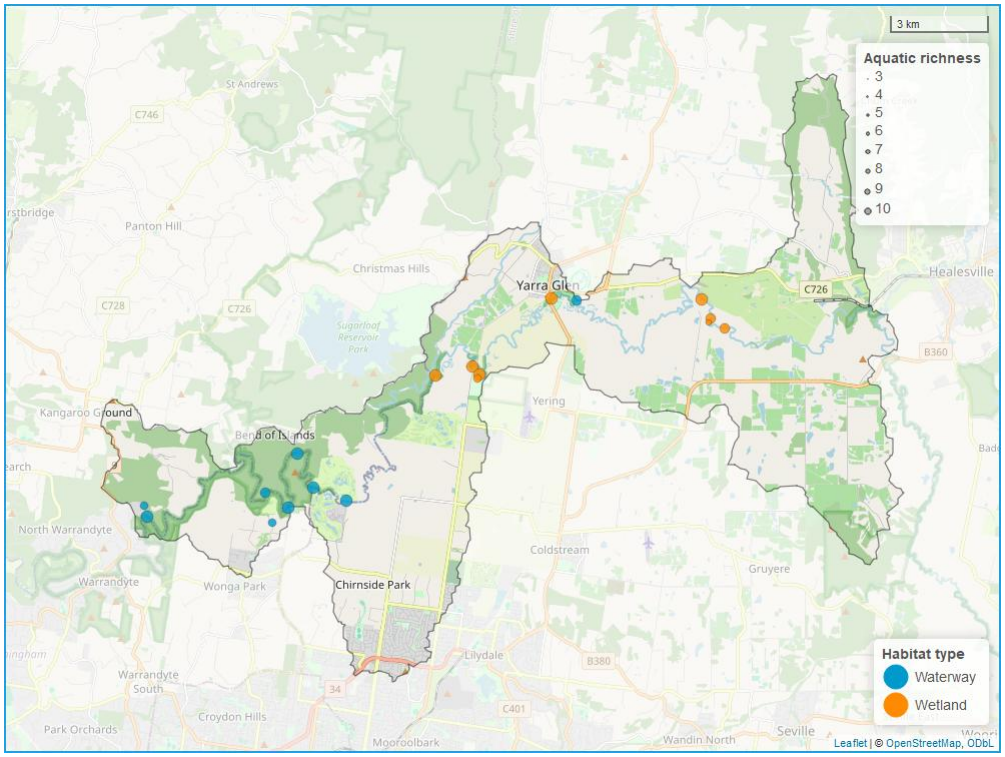

Fig. A67. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 49 samples were collected from 19 sites (Fig. A67)
- 95 taxa were detected (891 total detections); 25 were non-native and 4 were threatened

Detections

Table A67. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Galaxias ornatus* (Ornate galaxias)
Geocrinia victoriana (Eastern smooth frog (victorian smooth froglet))	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Hypseleotris sp*
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Maccullochella peelii* (Murray cod)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Macquaria australasica* (Macquarie perch)
Litoria ewingii OR Litoria verreauxii	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria fallax (Eastern dwarf tree frog)	*Nannoperca australis* (Southern pygmy perch)
Litoria lesueurii (Lesueur's frog (rocky river frog))	*Oncorhynchus mykiss* (Rainbow trout)
Litoria peronii (Peron's tree frog)	*Perca fluviatilis* (Redfin perch)
Anguilla australis (Short finned eel)	*Philypnodon grandiceps* (Flathead gudgeon)
Carassius auratus (Gold fish)	*Prototroctes maraena* (Australian grayling)
Cyprinidae sp	*Retropinna semoni* (Australian smelt)
Cyprinus carpio (Common carp)	*Rutilus rutilus* (Roach)
Gadopsis marmoratus (River blackfish)	*Salmo trutta* (Brown trout)
Galaxias brevipinnis (Climbing galaxias)	*Ornithorhynchus anatinus* (Platypus)
Galaxias maculatus (Common galaxias)	

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Yarra River Upper (Rural)

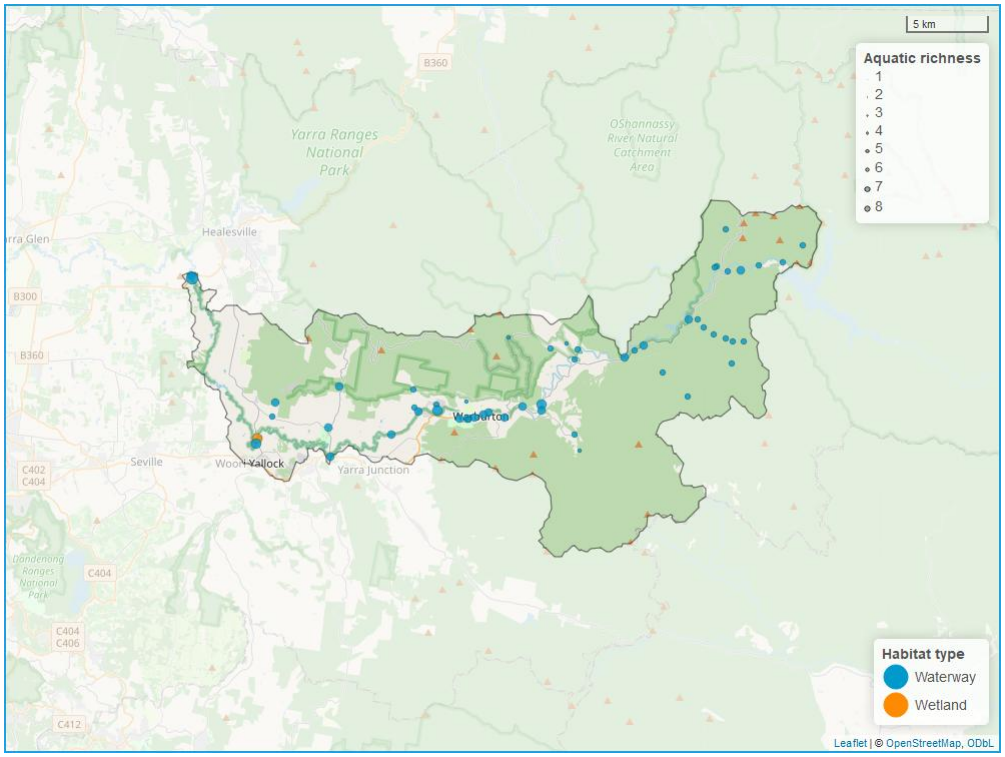

Fig. A68. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 85 samples were collected from 58 sites (Fig. A68)
- 101 taxa were detected (794 total detections); 22 were non-native and 3 were threatened

Detections

Table A68. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Crinia signifera (Eastern common froglet)	*Gambusia holbrooki* (Mosquito fish)
Limnodynastes dumerilii (Eastern banjo frog)	*Geotria australis* (Pouched lamprey)
Limnodynastes peronii (Brown-striped frog (striped marsh frog))	*Macquaria australasica* (Macquarie perch)
Limnodynastes tasmaniensis (Spotted grass frog (spotted marsh frog))	*Misgurnus anguillicaudatus* (Oriental weatherloach)
Litoria ewingii OR Litoria verreauxii	*Nannoperca australis* (Southern pygmy perch)
Litoria peronii (Peron's tree frog)	*Oncorhynchus mykiss* (Rainbow trout)
Anguilla australis (Short finned eel)	*Perca fluviatilis* (Redfin perch)
Carassius auratus (Gold fish)	*Philypnodon grandiceps* (Flathead gudgeon)
Cyprinus carpio (Common carp)	*Prototroctes maraena* (Australian grayling)
Gadopsis marmoratus (River blackfish)	*Retropinna semoni* (Australian smelt)
Galaxias brevipinnis (Climbing galaxias)	*Rutilus rutilus* (Roach)
Galaxias maculatus (Common galaxias)	*Salmo trutta* (Brown trout)
Galaxias ornatus (Ornate galaxias)	*Ornithorhynchus anatinus* (Platypus)

Yarra River Upper (Source)

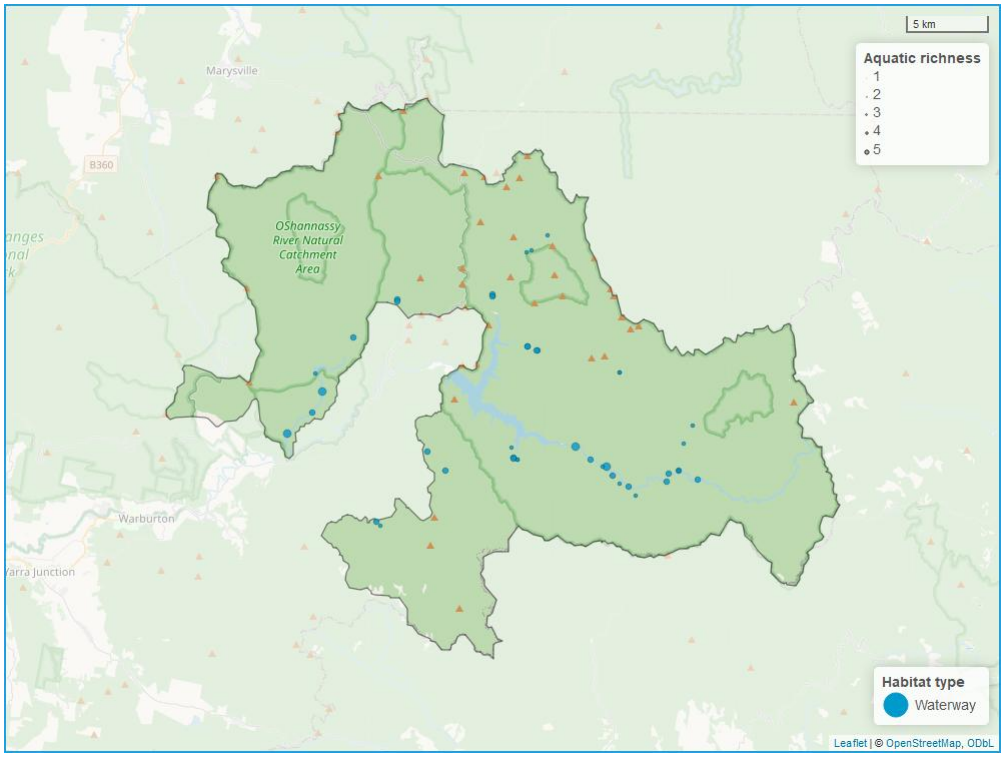

Fig. A69. Sampling locations and richness of aquatic taxa. Only sites in which one or more target taxa were detected are shown.

Summary

- 77 samples were collected from 51 sites (Fig. A69)
- 61 taxa were detected (450 total detections); 13 were non-native and 1 were threatened

Detections

Table A69. Aquatic taxa detected. Blue: non-native; Red: threatened; Green: new detection for subcatchment; Orange: new detection of threatened species.

Taxa detected	
Anguilla australis (Short finned eel)	*Nannoperca australis* (Southern pygmy perch)
Cyprinus carpio (Common carp)	*Oncorhynchus mykiss* (Rainbow trout)
Gadopsis marmoratus (River blackfish)	*Pseudaphritis urvillii* (Tupong)
Galaxias ornatus (Ornate galaxias)	*Retropinna semoni* (Australian smelt)
Gambusia holbrooki (Mosquito fish)	*Salmo trutta* (Brown trout)
Misgurnus anguillicaudatus (Oriental weatherloach)	*Ornithorhynchus anatinus* (Platypus)

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Appendix B: Complete list of detected data

Table A70. Full list of taxa detected in the MERI eDNA program.

Group	Taxonomy	Common name	Status	VIC FFG	EPBC	Subcatchments
Amphibians	*Crinia parinsignifera*	Eastern sign-bearing froglet (plains froglet)	Native	-	-	17, 23, 40, 47
	Crinia signifera	Eastern common froglet	Native	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68
	Geocrinia victoriana	Eastern smooth frog (victorian smooth froglet)	Native	-	-	7, 18, 19, 32, 36, 38, 45, 47, 49, 59, 64, 65, 66, 67
	Limnodynastes dumerilii	Eastern banjo frog	Native	-	-	2, 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34, 36, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68
	Limnodynastes peronii	Brown-striped frog (striped marsh frog)	Native	-	-	1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 18, 21, 23, 24, 25, 26, 27, 30, 31, 33, 35, 36, 38, 40, 41, 43, 44, 45, 48, 49, 50, 52, 55, 56, 61, 64, 65, 66, 67, 68
	Limnodynastes sp	-	-	-	-	43
	Limnodynastes tasmaniensis	Spotted grass frog (spotted marsh frog)	Native	-	-	2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 57, 58, 59, 62, 63, 66, 67, 68
	Lissotriton vulgaris	Common newt or smooth newt	Introduced	-	-	12
	Litoria ewingii OR Litoria verreauxii	-	-	-	-	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 29, 30, 32, 34, 35, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 52, 53, 54, 56, 59, 60, 64, 65, 66, 67, 68
	Litoria fallax	Eastern dwarf tree frog	Native	-	-	45, 65, 66, 67
	Litoria lesueurii	Lesueur's frog (rocky river frog)	Native	-	-	16, 32, 54, 63, 67
	Litoria peronii	Peron's tree frog	Native	-	-	2, 5, 11, 13, 18, 19, 23, 25, 29, 38, 45, 48, 55, 57, 59, 60, 66, 67, 68
	Litoria raniformis	Growling grass frog	Native	Vulnerable	Vulnerable	12, 25, 34, 36, 38, 39, 40, 46, 50, 52
	Litoria sp	-	-	-	-	3, 14, 22, 25, 28, 43, 62, 66
	Neobatrachus sudelli	Sudell's frog (common spadefoot toad)	Native	-	-	2, 34, 38, 40, 48, 50
	Pseudophryne sp	-	-	-	-	37
Birds	*Acanthagenys rufogularis*	Spiny-cheeked honeyeater	Native	-	-	1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Acanthiza lineata	Striated thornbill	Native	-	-	1, 2, 7, 8, 10, 19, 21, 23, 24, 32, 34, 45, 47, 53, 59, 60, 68
	Acanthiza nana	Yellow thornbill	Native	-	-	10, 47
	Acanthiza pusilla	Brown thornbill	Native	-	-	1, 5, 6, 7, 8, 10, 13, 14, 15, 17, 18, 19, 22, 25, 32, 35, 40, 41, 42, 43, 45, 47, 49, 52, 56, 59, 60, 61, 64, 65, 66, 67, 68, 69
	Acanthiza sp	-	-	-	-	8, 30, 56
	Acanthizidae sp	-	-	-	-	5, 7, 8, 19, 30, 32, 38, 42, 43, 44, 45, 56, 60, 61, 65, 68, 69
	Acanthorhynchus tenuirostris	Eastern spinebill	Native	-	-	34, 55
	Acanthorhynchus tenuirostris OR Entomyzon cyanotis	-	-	-	-	15, 18, 44, 45, 60, 61
	Accipiter sp	-	-	-	-	6, 21
	Accipitridae sp	-	-	-	-	8, 25
	Acrocephalus australis	Australian reed-warbler	-	-	-	7, 8, 11, 12, 13, 18, 20, 22, 24, 25, 28, 30, 31, 33, 35, 46, 47, 59, 62, 65, 67
	Alauda arvensis	Eurasian skylark	Introduced	-	-	34
	Alisterus scapularis	Australian king-parrot	Native	-	-	5, 6, 10, 24, 30, 35, 44, 45, 49, 52, 56, 60, 65, 67, 68
	Anas sp	-	-	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Anas superciliosa	Pacific black duck	Native	-	-	1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68, 69
	Anatidae sp	-	-	-	-	1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16, 17, 18, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 48, 50, 51, 54, 56, 58, 60, 61, 62, 63, 65, 66, 67, 68, 69
	Anhinga novaehollandiae	Australasian darter	Native	-	-	4, 43
	Anhinga sp	-	-	-	-	28
	Anhingidae sp	-	-	-	-	24, 40
	Anser anser OR Cygnus atratus OR Cygnus olor	-	-	-	-	1, 2, 8, 9, 10, 11, 12, 13, 15, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 47, 48, 49, 50, 51, 54, 56, 57, 60, 62, 64, 66, 67, 68
	Anthornis sp	-	-	-	-	9, 15, 16, 20, 24, 28, 32, 33, 34, 36, 37, 38, 40, 44, 54, 57, 58, 60, 64
	Aphelocephala leucopsis	Southern whiteface	Native	-	Vulnerable	20
	Aphrodroma brevirostris	Kerguelen petrel	Native	-	-	25, 43
	Ardea ibis	Cattle egret	-	-	-	1, 6, 25, 40, 56
	Ardea intermedia	Intermediate egret	Native	Critically Endangered	-	62
	Ardea sp	-	-	-	-	8, 9, 11, 24, 25, 30, 34, 37, 38, 50, 54, 62, 63, 66, 67
	Ardeidae sp	-	-	-	-	8, 45, 63
	Ardenna sp	-	-	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,

Group	Taxonomy	Common name	Status	VIC FFG	EPBC	Subcatchments
						22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68
	Artamus sp	-	-	-	-	24
	Aves sp	-	-	-	-	8, 22, 24, 25, 30, 40, 41, 45, 63, 65, 66
	Aythya australis	Hardhead	-	-	-	7, 12, 24, 36, 40, 43, 65
	Biziura lobata	Musk duck	Native	Vulnerable	-	21, 22, 28, 34, 43, 45, 47, 66
	Cacatua galerita	Sulphur-crested cockatoo	Native	-	-	1, 2, 3, 5, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 27, 31, 32, 34, 35, 36, 37, 41, 42, 43, 44, 45, 47, 48, 49, 51, 52, 54, 55, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Cacatua sanguinea	Little corella	Native	-	-	1, 2, 3, 5, 7, 8, 12, 13, 14, 15, 16, 17, 18, 19, 21, 23, 24, 25, 26, 27, 28, 30, 33, 34, 37, 38, 40, 41, 43, 44, 45, 46, 47, 48, 49, 51, 52, 54, 55, 57, 58, 59, 60, 61, 62, 63, 64, 66, 67, 68
	Cacatua sp	-	-	-	-	45, 51
	Cacatuidae sp	-	-	-	-	22, 45, 48, 66
	Calamanthus pyrrhopygius	Chestnut-rumped heathwren	-	-	-	24, 65
	Calidris sp	-	-	-	-	22
	Carduelis carduelis	European goldfinch	Introduced	-	-	5, 6, 20, 21, 23, 28, 39, 42, 48, 49, 50, 51, 62, 63, 64, 65
	Cereopsis novaehollandiae	Cape barren goose	Native	-	Vulnerable	1, 2, 3, 8, 9, 12, 13, 18, 21, 22, 23, 24, 25, 27, 28, 30, 31, 33, 35, 36, 37, 39, 40, 42, 43, 44, 48, 50, 54, 57, 62, 65, 66
	Charadriiformes sp	-	-	-	-	22, 40
	Charadrius mongolus	Lesser sand plover	-	Endangered	Endangered	21, 22, 23, 43
	Chenonetta jubata	Australian wood duck	Native	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Cladorhynchus leucocephalus	Banded stilt	Native	-	-	36, 50, 62
	Climacteris sp	-	-	-	-	66
	Colluricincla harmonica	Grey-shrike thrush	Native	-	-	24, 32, 56, 61, 64
	Colluricincla sp	-	-	-	-	30, 61
	Columba livia	Rock dove	Introduced	-	-	2, 3, 5, 9, 10, 12, 13, 15, 16, 18, 21, 23, 24, 25, 27, 28, 31, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 48, 49, 50, 51, 54, 55, 56, 57, 59, 62, 63, 65, 66, 67, 68
	Cormobates leucophaea	White-throated treecreeper	Native	-	-	2, 14, 22, 35, 44, 64
	Cormobates leucophaeus	White-throated treecreeper	Native	-	-	5, 7, 9, 13, 21, 25, 34, 43, 44, 46, 49, 50, 63, 69
	Corvidae sp	-	-	-	-	22, 38, 66
	Corvus coronoides	Australian raven	Native	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 62, 63, 64, 66, 67, 68
	Corvus sp	-	-	-	-	22, 38, 66
	Coturnix chinensis	King quail	Native	-	-	8, 23, 33
	Coturnix sp	-	-	-	-	40
	Dacelo novaeguineae	Laughing kookaburra	Native	-	-	1, 3, 4, 6, 7, 8, 10, 13, 14, 15, 16, 18, 19, 20, 23, 24, 30, 32, 34, 35, 37, 41, 42, 43, 44, 45, 52, 53, 54, 56, 60, 61, 64, 65, 66, 67, 68
	Dromaius novaehollandiae	Emu	Native	-	-	13, 43, 51
	Eclectus roratus	Eclectus parrot	Native	-	-	5, 36, 50
	Egretta sp	-	-	-	-	1, 4, 5, 6, 8, 10, 11, 16, 18, 19, 20, 21, 22, 24, 25, 27, 29, 30, 31, 33, 34, 36, 38, 39, 42, 45, 47, 49, 50, 52, 53, 56, 57, 61, 62, 63, 64, 67
	Elseyornis melanops	Black-fronted dotterel	Native	-	-	9, 25, 62, 64, 66
	Eolophus roseicapilla	Galah	Native	-	-	1, 2, 5, 8, 10, 11, 12, 13, 15, 16, 18, 20, 21, 23, 25, 27, 30, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 49, 50, 51, 52, 54, 56, 57, 59, 60, 61, 62, 63, 64, 65, 66, 67, 69
	Eopsaltria australis	Eastern yellow robin	Native	-	-	7, 10, 14, 22, 24, 35, 42, 43, 45, 48, 53, 55, 59, 61, 63, 65, 68, 69
	Erythrogonys cinctus	Red-kneed dotterel	Native	-	-	62
	Eulabeornis sp	-	-	-	-	6, 9, 22, 25, 33, 38, 42, 43, 50
	Fulica atra	Eurasian coot	Native	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 56, 57, 60, 62, 63, 65, 66, 67, 68
	Gallinula tenebrosa	Dusky moorhen	Native	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 55, 56, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68, 69
	Gallirallus philippensis	Buff-banded rail	-	-	-	1, 5, 9, 10, 11, 12, 13, 15, 20, 22, 23, 25, 31, 34, 35, 39, 43, 44, 45, 48, 49, 54, 63, 65, 66, 67, 68
	Gallus gallus	Chicken	Introduced	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Grallina cyanoleuca	Magpie-lark	Native	-	-	2, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 18, 21, 23, 24, 25, 27, 28, 29, 30, 31, 35, 36, 38, 39, 40, 42, 43, 44, 48, 49, 50, 51, 52, 54, 56, 58, 62, 66, 67
	Grus antigone	Sarus crane	-	-	-	36
	Gymnorhina tibicen	Australian magpie	Native	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68, 69
	Haematopus sp	-	-	-	-	62
	Himantopus himantopus	Black-winged stilt	Native	-	-	22, 25, 31, 36, 50, 62
	Laridae sp	-	-	-	-	2, 12, 25
	Larus sp	-	-	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 21, 22, 23, 24, 25, 26, 27, 28, 30, 31, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 48, 49, 50, 51, 52, 54, 56, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68
	Leucocarbo sp	-	-	-	-	1, 9, 10, 21, 23, 34, 43, 62, 63, 68
	Leucosarcia melanoleuca	Wonga pigeon	Native	-	-	6, 18

Group	Taxonomy	Common name	Status	VIC FFG	EPBC	Subcatchments
	Lewinia pectoralis	Lewin's rail	Native	Vulnerable	-	3, 12, 20, 21, 22, 23, 29, 30, 39, 41, 42, 43, 57, 58, 63
	Maluridae sp	-	-	-	-	66
	Malurus sp	-	-	-	-	1, 2, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 24, 29, 32, 34, 36, 37, 38, 39, 40, 41, 42, 43, 46, 47, 48, 49, 52, 55, 57, 58, 59, 61, 62, 63, 64, 66, 67, 69
	Manorina melanocephala	Noisy miner	Native	-	-	2, 3, 5, 6, 7, 8, 10, 11, 12, 13, 15, 18, 21, 23, 25, 27, 28, 30, 31, 34, 36, 37, 38, 40, 41, 42, 43, 44, 45, 48, 50, 51, 52, 54, 55, 57, 60, 65, 66, 68
	Manorina melanophrys	Bell miner	Native	-	-	5, 7, 8, 18, 40, 41, 65
	Meleagris gallopavo	Turkey	Introduced	-	-	1, 2, 5, 12, 13, 15, 18, 21, 23, 25, 30, 31, 40, 41, 42, 45, 50, 66
	Meleagris sp	-	-	-	-	1, 12, 18, 33, 35, 36, 51, 61, 68
	Meliphagidae sp	-	-	-	-	6, 8, 25, 28, 31, 34, 35, 36, 38, 39, 46, 58, 59, 60, 62, 64, 66, 68, 69
	Melithreptus brevirostris	Brown-headed honeyeater	Native	-	-	59
	Melopsittacus undulatus	Budgerigar	Native	-	-	9, 13, 21, 39, 66
	Menura novaehollandiae	Superb lyrebird	Native	-	-	7, 35, 47, 52, 56, 60, 61, 65, 68, 69
	Microcarbo melanoleucos	Little pied cormorant	Native	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 56, 57, 62, 63, 64, 65, 66, 67, 68, 69
	Morus serrator	Australasian gannet	Native	-	-	36
	Nesoptilotis leucotis	White-eared honeyeater	Native	-	-	16, 34, 50, 59, 64
	Ninox novaeseelandiae	Morepork	Native	-	-	8, 14, 56, 63, 68
	Nycticorax caledonicus	Nankeen night-heron	-	-	-	6, 12, 13, 15, 21, 22, 23, 25, 28, 29, 30, 38, 40, 44, 62, 63, 66
	Nymphicus hollandicus	Cockatiel	Native	-	-	2, 5, 7, 10, 12, 21, 22, 23, 30, 36, 37, 38, 44, 45, 48, 50, 51, 52, 54, 58, 65, 66, 69
	Oceanites oceanicus	Wilson's storm-petrel	Native	-	-	1
	Ocyphaps lophotes	Crested pigeon	Native	-	-	2, 3, 5, 6, 8, 10, 11, 12, 13, 15, 18, 21, 23, 25, 27, 28, 29, 30, 31, 35, 36, 37, 38, 39, 40, 41, 43, 44, 46, 48, 49, 50, 51, 52, 54, 56, 57, 58, 62, 63, 64, 65, 66, 69
	Oxyura australis	Blue-billed duck	Native	Vulnerable	-	3, 9, 12, 17, 22, 25, 28, 42, 47, 62
	Pachycephala sp	-	-	-	-	1, 5, 13, 14, 22, 24, 34, 35, 41, 42, 47, 49, 61, 68, 69
	Passeriformes sp	-	-	-	-	22, 24, 25, 41, 45, 66
	Pavo cristatus	Indian peafowl	Introduced	-	-	47
	Pelecanus conspicillatus	Australian pelican	Native	-	-	2, 6, 9, 10, 12, 13, 15, 21, 22, 25, 34, 36, 41, 44, 57, 62, 63
	Petroica sp	-	-	-	-	29
	Phalacrocoracidae sp	-	-	-	-	2, 12, 22, 25, 28, 31, 33, 34, 36, 43, 45, 50, 62, 63
	Phalacrocorax carbo	Great cormorant	Native	-	-	1, 12, 17, 22, 23, 24, 28, 30, 32, 34, 36, 38, 40, 41, 43, 45, 47, 50, 62, 63, 64, 66, 68
	Phalacrocorax sp	-	-	-	-	24, 36, 37, 40, 45, 50, 54, 62, 63, 66
	Phalacrocorax sulcirostris	Little black cormorant	Native	-	-	1, 2, 3, 6, 7, 9, 11, 24, 25, 33, 34, 36, 38, 41, 43, 44, 46, 47, 50, 56, 67, 68
	Phaps chalcoptera	Common bronzewing	Native	-	-	3, 5, 6, 8, 10, 11, 13, 15, 17, 18, 21, 23, 25, 27, 34, 35, 40, 41, 42, 43, 44, 45, 47, 48, 49, 54, 60, 65, 66, 67, 68
	Phylidonyris novaehollandiae	New holland honeyeater	Native	-	-	9, 34, 46, 50, 58, 63
	Platalea sp	-	-	-	-	22, 25, 28, 43, 62
	Platycercus eximius	Eastern rosella	Native	-	-	1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 30, 32, 34, 35, 38, 39, 40, 42, 43, 44, 45, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 58, 59, 60, 61, 63, 64, 65, 66, 67, 68, 69
	Podargus sp	-	-	-	-	3, 21
	Podargus strigoides	Tawny frogmouth	Native	-	-	2, 3, 5, 10, 18, 23, 25, 30, 35, 43, 48, 52, 66, 69
	Podiceps cristatus	Great crested grebe	Native	-	-	12
	Poodytes gramineus	Little grassbird	-	-	-	12, 21, 30
	Poodytes punctatus	New zealand fernbird	-	-	-	9, 28, 33, 62
	Poodytes sp	-	-	-	-	20, 63
	Porphyrio porphyrio	Australasian swamphen	Native	-	-	2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 52, 55, 56, 57, 58, 60, 62, 63, 64, 65, 66, 67, 68
	Porphyrio sp	-	-	-	-	8, 22, 25, 30, 38, 45, 65, 66
	Porzana sp	-	-	-	-	8, 25, 38
	Psephotus haematonotus	Red-rumped parrot	Native	-	-	2, 15, 18, 25, 29, 33, 34, 37, 38, 39, 40, 48, 50, 58, 62, 63
	Psittacidae sp	-	-	-	-	6, 8, 24, 27, 35, 44, 45, 56, 60, 65, 68
	Ptilonorhynchus violaceus	Satin bowerbird	Native	-	-	43, 56, 60, 68, 69
	Ptilotula penicillata	White-plumed honeyeater	Native	-	-	2, 5, 8, 9, 10, 11, 14, 15, 16, 18, 19, 24, 25, 28, 29, 31, 34, 35, 38, 39, 40, 41, 42, 44, 46, 48, 51, 52, 54, 56, 57, 58, 59, 61, 62, 63, 64
	Pycnoptilus floccosus	Pilotbird	Native	Vulnerable	Vulnerable	10, 69
	Rallidae sp	-	-	-	-	8, 22, 25, 41
	Rhipidura fuliginosa	Grey fantail	-	-	-	11, 13, 14, 17, 19, 22, 26, 30, 35, 37, 41, 42, 45, 47, 52, 59, 60, 65, 66, 68
	Rhipidura sp	-	-	-	-	43, 64, 65
	Sericornis frontalis	White-browed scrubwren	Native	-	-	1, 2, 5, 6, 7, 8, 10, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 32, 34, 35, 38, 40, 41, 42, 43, 45, 46, 47, 48, 49, 51, 52, 53, 55, 56, 57, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Sericornis sp	-	-	-	-	18, 27, 35, 45, 49, 52, 55, 59, 60, 61, 65, 68, 69
	Streptopelia chinensis	Spotted dove	Introduced	-	-	2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 15, 18, 21, 23, 24, 25, 26, 27, 28, 30, 31, 33, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 49, 50, 51, 54, 55, 56, 57, 58, 59, 62, 63, 66, 69
	Struthio camelus	Ostrich	Introduced	-	-	60
	Sturnus sp	-	-	-	-	2, 3, 6, 11, 12, 13, 15, 17, 18, 21, 23, 27, 28, 33, 35, 36, 38, 39, 40, 41, 42, 43, 44, 45, 50, 58, 62, 65
	Sturnus vulgaris	Common starling	Introduced	-	-	1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 15, 16, 18, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 62, 63, 64, 65, 66, 67
	Tachybaptus novaehollandiae	Australasian grebe	Native	-	-	3, 5, 8, 9, 10, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 24, 25, 28, 29, 32, 33, 34, 36, 37, 38, 39, 40, 42, 43, 47, 48, 49, 50, 58, 62, 63, 66, 67

Group	Taxonomy	Common name	Status	VIC FFG	EPBC	Subcatchments
	Tadorna sp	-	-	-	-	6, 8, 9, 14, 22, 30, 33, 36, 37, 43, 60, 62, 65
	Tadorna tadornoides	Australian shelduck	-	-	-	8, 62
	Thalassarche melanophrys	Mollymawk	Native	-	-	8, 15, 21, 23, 25, 44, 48, 65, 66
	Thalassarche sp	-	-	-	-	35
	Thalasseus bergii	Crested tern	Native	-	-	43
	Threskiornis sp	-	-	-	-	1, 5, 9, 10, 12, 13, 16, 21, 22, 23, 24, 25, 27, 28, 30, 31, 33, 35, 36, 37, 38, 39, 40, 41, 42, 44, 45, 47, 49, 50, 52, 55, 59, 60, 62, 65, 66, 67, 68
	Todiramphus sanctus	Sacred kingfisher	Native	-	-	8, 22, 48, 59, 62
	Trichoglossus moluccanus	Rainbow lorikeet	Native	-	-	2, 3, 5, 8, 10, 12, 13, 14, 15, 18, 21, 23, 24, 25, 27, 28, 29, 31, 37, 38, 39, 40, 41, 43, 44, 45, 46, 48, 49, 50, 51, 54, 57, 59, 60, 62, 63, 65, 66, 68
	Turdus merula	Common blackbird	Introduced	-	-	3, 6, 8, 12, 13, 14, 15, 16, 17, 21, 23, 25, 26, 27, 28, 29, 30, 31, 32, 34, 37, 38, 39, 40, 41, 42, 43, 45, 48, 50, 51, 52, 53, 54, 55, 56, 58, 60, 62, 63, 64, 65, 66, 67
	Turdus merula OR Turdus philomelos	-	-	-	-	4, 17, 20, 24, 37, 40, 51, 54, 57
	Turdus sp	-	-	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68
	Tyto alba	Barn owl	Native	-	-	21
	Zosterops lateralis	Silvereye	Native	-	-	1, 2, 4, 6, 8, 9, 10, 11, 14, 15, 17, 18, 20, 21, 22, 24, 25, 30, 32, 33, 35, 37, 40, 41, 42, 43, 45, 46, 49, 52, 55, 56, 57, 59, 60, 61, 63, 64, 65, 66, 67
Fish	*Acanthaluteres sp*	-	-	-	-	22, 41, 42
	Acanthogobius flavimanus	Yellowfin goby	Introduced	-	-	2, 6, 8, 12, 25, 28, 30, 33, 36, 37, 40, 51, 54, 62, 66
	Acanthopagrus butcheri	Black bream	Native	-	-	1, 2, 9, 11, 12, 22, 23, 25, 28, 30, 31, 33, 36, 37, 40, 41, 42, 43, 50, 51, 54, 62, 66
	Acentrogobius pflaumii	Striped sandgoby	Introduced	-	-	66
	Acentrogobius sp	-	-	-	-	37
	Afurcagobius tamarensis	Tamar goby	Native	-	-	1, 2, 6, 8, 11, 12, 22, 25, 28, 31, 33, 37, 40, 41, 42, 43, 50, 51, 54, 62, 66
	Aldrichetta forsteri	Yelloweye mullet	Native	-	-	1, 2, 6, 8, 9, 11, 12, 22, 25, 28, 30, 31, 33, 36, 37, 40, 41, 42, 43, 50, 51, 54, 62, 66
	Alopias sp	-	-	-	-	30
	Ammotretis rostratus	Longsnout flounder	Native	-	-	11, 12, 22, 41
	Anguilla australis	Short finned eel	Native	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Anguilla reinhardtii	Longfin eel	Native	-	-	6, 8, 11, 12, 56
	Anguilla sp	-	-	-	-	10, 14, 21
	Arenigobius bifrenatus	Bridled goby	Native	-	-	1, 2, 11, 12, 22, 25, 28, 31, 33, 36, 37, 41, 42, 43, 50, 54, 62, 66
	Arenigobius frenatus	Halfbridled goby	Native	-	-	1, 2, 8, 11, 12, 22, 25, 28, 31, 37, 40, 41, 42, 43, 50, 54, 62, 66
	Argyrosomus japonicus	Mulloway	-	-	-	37
	Arripis trutta	Australian salmon	Native	-	-	25, 30, 31
	Atherinosoma microstoma	Small-mouth hardyhead	Native	-	-	1, 2, 8, 9, 11, 12, 22, 25, 28, 30, 31, 33, 34, 36, 37, 41, 43, 50, 54, 62, 66
	Bidyanus bidyanus	Silver perch	Native	Endangered	Endangered	2, 8, 12, 42, 43, 45, 62
	Brachaluteres jacksonianus	Southern pygmy leatherjacket	Native	-	-	62
	Carassius auratus	Gold fish	Introduced	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 54, 55, 56, 57, 58, 60, 62, 63, 64, 65, 66, 67, 68
	Chrysophrys auratus	Snapper	-	-	-	2, 6, 11, 12, 13, 22, 23, 25, 27, 28, 31, 37, 40, 41, 48, 54, 57, 62
	Cyprinidae sp	-	-	-	-	66, 67
	Cyprinus carpio	Common carp	Introduced	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Dasyatis thetidis	Cow stingray	-	-	-	41
	Decapterus sp	-	-	-	-	1, 12
	Dentex sp	-	-	-	-	28, 36, 62
	Diodon nicthemerus	Globefish	-	-	-	42
	Diodon sp	-	-	-	-	2, 31
	Emmelichthys sp	-	-	-	-	50
	Engraulis australis	Australian anchovy	-	-	-	23, 37
	Epigonus sp	-	-	-	-	43
	Gadopsis marmoratus	River blackfish	Native	-	-	5, 6, 7, 8, 10, 15, 18, 19, 28, 30, 32, 35, 36, 39, 44, 45, 47, 55, 56, 59, 60, 61, 63, 65, 66, 67, 68, 69
	Galaxias brevipinnis	Climbing galaxias	Native	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 18, 19, 21, 22, 23, 25, 26, 27, 30, 32, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 51, 52, 54, 56, 58, 59, 60, 61, 62, 66, 67, 68
	Galaxias maculatus	Common galaxias	Native	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68
	Galaxias ornatus	Ornate galaxias	Native	-	-	4, 5, 7, 8, 13, 14, 15, 16, 17, 18, 19, 20, 24, 27, 29, 32, 35, 37, 44, 45, 47, 48, 49, 52, 53, 55, 56, 59, 60, 61, 63, 64, 65, 66, 67, 68, 69
	Galaxias truttaceus	Spotted galaxias	Native	-	-	1, 2, 6, 8, 11, 12, 21, 22, 23, 25, 28, 30, 31, 40, 41, 42, 43, 51, 54, 57, 59, 60, 61, 66
	Galaxiella pusilla	Dwarf galaxias	Native	Endangered	Endangered	6, 7, 8, 13, 21, 25, 30, 43
	Gambusia holbrooki	Mosquito fish	Introduced	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Geotria australis	Pouched lamprey	Native	-	-	6, 8, 10, 12, 13, 21, 25, 30, 35, 42, 60, 62, 68
	Girella tricuspidata	Luderick	Native	-	-	1, 11, 22, 28, 31, 41
	Girella zebra	Zebra fish	Native	-	-	22, 41
	Gobiopterus semivestitus	Glassgoby	Native	-	-	2, 8, 11, 12, 22, 25, 28, 30, 33, 37, 40, 41, 51, 54, 62, 66
	Haletta semifasciata	Blue weed whiting	Native	-	-	1, 27
	Heteroclinus heptaeolus	Seven-bar weedfish	Native	-	-	2, 9, 31

Group	Taxonomy	Common name	Status	VIC FFG	EPBC	Subcatchments
	Heteroclinus sp	-	-	-	-	22, 41
	Hipposcarus sp	-	-	-	-	6
	Hyperlophus sp	-	-	-	-	12, 37
	Hyperlophus vittatus	Sandy sprats	Native	-	-	1, 6, 9, 11, 12, 25, 28, 33, 36, 37, 41, 62, 66
	Hypseleotris sp	-	-	-	-	8, 11, 12, 21, 25, 30, 38, 41, 45, 48, 49, 52, 59, 60, 66, 67
	Lates calcarifer	Barramundi	Native	-	-	12, 13, 23, 28, 37, 38, 51, 54, 62
	Liza argentea	Goldspot mullet	-	-	-	1, 2, 11, 12, 22, 25, 28, 31, 33, 37, 40, 41, 42, 54, 66
	Maccullochella peelii	Murray cod	Native	Endangered	Vulnerable	12, 27, 38, 48, 49, 66, 67
	Macquaria ambigua	Golden perch	Native	-	-	1, 2, 12, 38, 42, 44, 45, 48, 53, 55, 59, 62, 63, 64, 66
	Macquaria australasica	Macquarie perch	Native	Endangered	Endangered	5, 18, 48, 60, 66, 67, 68
	Macquaria colonorum	Estuary perch	Native	-	-	1, 2, 6, 8, 12, 21, 22, 23, 25, 28, 30, 33, 37, 40, 41, 42, 43, 51, 54, 57, 62, 63, 65, 66
	Meuschenia trachylepis	Yellowfin leatherjacket	Native	-	-	11, 41
	Misgurnus anguillicaudatus	Oriental weatherloach	Introduced	-	-	3, 5, 7, 9, 10, 11, 12, 13, 15, 18, 19, 21, 22, 23, 24, 25, 27, 31, 35, 37, 38, 39, 40, 43, 44, 45, 48, 49, 50, 51, 52, 54, 55, 57, 59, 62, 65, 66, 67, 68, 69
	Mugil cephalus	Sea mullet	Native	-	-	2, 11, 12, 21, 22, 28, 37, 41, 42, 62
	Mugilidae sp	-	-	-	-	8
	Mugilogobius platynotus	Pale mangrove goby	Native	Endangered	-	11, 22, 41, 42
	Myliobatidae sp	-	-	-	-	6
	Nannoperca australis	Southern pygmy perch	-	-	-	1, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 16, 17, 18, 21, 22, 24, 26, 27, 30, 32, 34, 35, 37, 39, 41, 42, 43, 45, 47, 48, 49, 52, 55, 56, 57, 59, 60, 61, 63, 64, 65, 66, 67, 68, 69
	Nannoperca obscura	Yarra pygmy perch	Native	Vulnerable	Vulnerable	17
	Neochanna cleaveri	Australian mudfish	Native	Endangered	-	43
	Neoodax balteatus	Little weed whiting	Native	-	-	25, 27, 42
	Notolabrus fucicola	Yellow-saddled wrasse	Native	-	-	27
	Notorynchus cepedianus	Cowshark	Native	-	-	37, 41
	Olisthops cyanomelas	Herring cale	Native	-	-	27
	Oncorhynchus mykiss	Rainbow trout	Introduced	-	-	2, 5, 8, 12, 17, 18, 21, 24, 34, 35, 37, 42, 43, 45, 48, 49, 52, 58, 60, 61, 63, 64, 65, 66, 67, 68, 69
	Pagrus sp	-	-	-	-	30
	Parargyrops sp	-	-	-	-	41
	Perca fluviatilis	Redfin perch	Introduced	-	-	1, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 23, 24, 26, 27, 28, 30, 32, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 47, 48, 49, 52, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68
	Percichthyidae sp	-	-	-	-	65
	Philypnodon grandiceps	Flathead gudgeon	Native	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 20, 21, 23, 24, 25, 26, 28, 31, 33, 34, 35, 36, 37, 38, 39, 40, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68
	Philypnodon macrostomus	Dwarf flathead gudgeon	Native	-	-	30
	Platycephalus sp	-	-	-	-	11, 12, 22, 37, 41, 62
	Polyprion sp	-	-	-	-	37
	Pristiophorus nudipinnis	Southern saw shark	Native	-	-	37
	Prototroctes maraena	Australian grayling	Native	Endangered	Vulnerable	6, 8, 12, 26, 28, 30, 37, 56, 62, 67, 68
	Pseudaphritis urvillii	Tupong	Native	-	-	1, 2, 6, 7, 8, 11, 12, 13, 21, 22, 23, 25, 26, 28, 30, 31, 33, 36, 37, 40, 41, 42, 43, 48, 49, 50, 51, 56, 57, 62, 69
	Pseudogobius olorum	Bluespot goby	Native	-	-	1, 2, 8, 9, 11, 12, 22, 25, 28, 30, 31, 33, 36, 37, 40, 41, 42, 43, 50, 51, 54, 62, 66
	Pseudomugil sp	-	-	-	-	26
	Redigobius macrostoma	Largemouth goby	Native	-	-	2, 12, 25, 37, 62, 66
	Retropinna semoni	Australian smelt	Native	-	-	1, 4, 5, 6, 7, 9, 16, 17, 18, 24, 28, 30, 32, 33, 34, 35, 36, 37, 38, 39, 40, 44, 45, 48, 49, 51, 52, 54, 55, 56, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68, 69
	Rhombosolea tapirina	Greenback flounder	Native	-	-	1, 9, 11, 25, 31, 54
	Rhynchobatus sp	-	-	-	-	1, 11, 22, 31, 62
	Rutilus rutilus	Roach	Introduced	-	-	3, 5, 8, 10, 11, 12, 13, 15, 16, 18, 19, 21, 23, 24, 32, 35, 37, 38, 39, 40, 44, 45, 46, 47, 48, 49, 50, 52, 54, 55, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68
	Salmo salar	Atlantic salmon	Introduced	-	-	65
	Salmo sp	-	-	-	-	4
	Salmo trutta	Brown trout	Introduced	-	-	2, 5, 6, 7, 8, 9, 10, 12, 13, 15, 16, 18, 19, 20, 21, 23, 24, 30, 31, 32, 34, 35, 37, 38, 41, 42, 43, 44, 45, 47, 48, 49, 51, 52, 55, 56, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Salvelinus fontinalis	Brook trout	Introduced	-	-	60, 65
	Salvelinus sp	-	-	-	-	65
	Scobinichthys granulatus	Rough leatherjacket	Native	-	-	2, 22, 25
	Seriola lalandi	Yellowtail kingfish	-	-	-	66
	Siganus sp	-	-	-	-	54
	Sillaginodes punctatus	King george whiting	Native	-	-	22, 23, 41, 66
	Sparidae sp	-	-	-	-	11, 30, 62
	Stigmatopora nigra	Widebody pipefish	Native	-	-	2, 41, 62
	Tasmanogobius lasti	Scary's tasmangoby	Native	-	-	1, 9, 12, 25, 28, 31, 33, 36, 62
	Tetractenos glaber	Smooth toadfish	Native	-	-	1, 2, 6, 8, 9, 11, 12, 22, 23, 25, 28, 30, 31, 33, 36, 37, 41, 42, 43, 62, 66
	Thunnus albacares	Yellowfin tuna	-	-	-	41
	Thunnus sp	-	-	-	-	40
	Tinca tinca	Tench	Introduced	-	-	4, 7, 8, 11, 12, 16, 17, 18, 20, 24, 28, 32, 33, 37, 40, 43, 48, 51, 52, 54, 57, 60, 62, 63, 64, 65, 66
	Tridentiger trigonocephalus	Trident goby	Introduced	-	-	2
Mammals	*Acrobates pygmaeus*	Feathertail glider	Native	-	-	19, 56, 60, 61, 69
	Antechinus sp	-	-	-	-	7, 14, 30, 35, 42, 43, 47, 56, 60, 61, 65, 68, 69
	Arctocephalus pusillus	Australian fur seal (brown fur seal)	Native	-	-	41
	Bos taurus	Cattle	Introduced	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68
	Canidae sp	-	-	-	-	41, 66
	Canis lupus	Dog or dingo	Introduced	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69

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Group	Taxonomy	Common name	Status	VIC FFG	EPBC	Subcatchments
	Capra hircus	Goat	Introduced	-	-	3, 8, 9, 10, 11, 12, 13, 17, 18, 20, 21, 23, 28, 32, 34, 37, 38, 39, 40, 41, 43, 44, 49, 50, 52, 54, 55, 56, 63, 65, 66
	Cercartetus nanus	Eastern pygmy-possum	Native	-	-	61
	Cervidae sp	-	-	-	-	7, 35, 63
	Cervus elaphus	Red deer	Introduced	-	-	5, 6, 8, 13, 15, 17, 18, 19, 24, 26, 30, 35, 47, 48, 49, 51, 55, 56, 57, 59, 63, 65, 67
	Cervus sp	-	-	-	-	30, 63
	Chalinolobus gouldii	Gould's wattled bat	Native	-	-	2, 5, 6, 15, 27, 32, 34, 37, 40, 62
	Chalinolobus morio	Chocolate wattled bat	Native	-	-	27, 43, 68
	Chalinolobus sp	-	-	-	-	34
	Dama dama	Fallow deer	Introduced	-	-	1, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 18, 19, 20, 21, 25, 34, 35, 38, 44, 45, 47, 48, 52, 53, 56, 59, 60, 61, 64, 65, 66, 67, 68
	Dasyuridae sp	-	-	-	-	11
	Dasyurus sp	-	-	-	-	11
	Diprotodontia sp	-	-	-	-	22, 45, 66
	Eptesicus regulus	Southern forest bat	Native	-	-	43, 68
	Eptesicus sp	-	-	-	-	22, 52, 68
	Eptesicus vulturnus	Little forest bat	Native	-	-	3, 8
	Equus caballus	Horse	Introduced	-	-	1, 4, 5, 7, 8, 10, 11, 12, 13, 15, 17, 21, 25, 29, 32, 34, 39, 41, 42, 43, 44, 45, 47, 48, 49, 52, 55, 58, 59, 60, 62, 64, 65, 66, 67, 68, 69
	Felis catus	Domestic cat	Introduced	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 18, 21, 23, 25, 26, 27, 28, 30, 31, 35, 36, 37, 38, 40, 41, 43, 44, 48, 49, 50, 52, 54, 55, 56, 57, 59, 62, 63, 64, 65, 66, 68
	Hydromys chrysogaster	Rakali (water rat)	Native	-	-	1, 2, 3, 5, 6, 7, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40, 42, 43, 45, 47, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 68, 69
	Isoodon obesulus	Southern brown bandicoot	Native	Endangered	Endangered	6, 11
	Lama sp	-	-	-	-	8, 17, 42, 52
	Lepus europaeus	European hare	Introduced	-	-	9, 12, 18, 23, 24, 28, 29, 31, 37, 38, 40, 48, 50, 51, 58
	Macropodidae sp	-	-	-	-	28, 31, 33, 34, 62, 63
	Macropus fuliginosus	Western grey kangaroo	Native	-	-	14, 28
	Macropus giganteus	Eastern grey kangaroo	Native	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68
	Mastacomys fuscus	Broad-toothed rat	-	Vulnerable	Endangered	7, 22, 35, 52, 65, 66
	Muridae sp	-	-	-	-	7, 56, 66, 68
	Mus musculus	House mouse	Introduced	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Notamacropus rufogriseus	Red-necked wallaby	Native	-	-	2
	Notamacropus sp	-	-	-	-	5, 13, 41, 42, 53
	Ornithorhynchus anatinus	Platypus	Native	Vulnerable	-	5, 6, 7, 8, 10, 13, 15, 16, 17, 18, 24, 30, 32, 35, 37, 38, 44, 45, 47, 48, 49, 55, 56, 57, 58, 59, 60, 61, 62, 63, 65, 66, 67, 68, 69
	Oryctolagus cuniculus	Rabbit	Introduced	-	-	2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68
	Osphranter sp	-	-	-	-	18, 31, 67
	Ovis aries	Sheep	Introduced	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68
	Perameles gunnii	Eastern barred bandicoot	Native	Endangered	Endangered	22
	Perameles nasuta	Southern long-nosed bandicoot	Native	-	-	5, 7, 56, 61
	Perameles sp	-	-	-	-	22
	Petauroides volans	Greater glider	Native	Endangered	Endangered	7, 32, 35, 45, 52, 53, 56, 60, 61, 64, 65, 68, 69
	Petaurus australis	Yellow-bellied glider	Native	Vulnerable	Vulnerable	7, 61, 68, 69
	Petaurus breviceps	Sugar glider	Native	-	-	1, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 30, 32, 34, 35, 37, 38, 39, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 59, 60, 61, 63, 64, 65, 66, 67, 68, 69
	Phalangeridae sp	-	-	-	-	66
	Phascogale tapoatafa	Brush-tailed phascogale	Native	Vulnerable	Vulnerable	52
	Phascolarctos cinereus	Koala	Native	-	-	7, 8, 22, 24, 34, 35, 42, 43
	Potorous sp	-	-	-	-	22
	Potorous tridactylus	Long-nosed potoroo	Native	Vulnerable	Vulnerable	22
	Pseudocheirus peregrinus	Common ringtail possum	Native	-	-	1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Pseudochirulus sp	-	-	-	-	56
	Pteropus alecto	Black flying-fox	Native	-	-	15, 66
	Pteropus poliocephalus	Grey-headed flying fox	Native	Vulnerable	Vulnerable	2, 3, 5, 6, 11, 12, 13, 15, 18, 21, 23, 25, 27, 28, 31, 33, 34, 36, 37, 38, 40, 41, 42, 44, 48, 50, 51, 54, 55, 57, 58, 60, 62, 63, 66
	Pteropus sp	-	-	-	-	4, 22, 66
	Rattus fuscipes	Bush rat	Native	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Rattus norvegicus	Brown rat	Introduced	-	-	2, 3, 5, 8, 9, 10, 11, 12, 13, 15, 18, 21, 23, 25, 27, 28, 31, 33, 36, 37, 38, 39, 40, 41, 43, 44, 45, 48, 49, 50, 51, 52, 54, 55, 57, 61, 62, 64, 66, 67, 68
	Rattus rattus	Black rat	Introduced	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57,

Group	Taxonomy	Common name	Status	VIC FFG	EPBC	Subcatchments
						58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Rattus sp	-	-	-	-	1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 61, 63, 64, 65, 66, 67, 68, 69
	Rusa unicolor	Sambar deer	Introduced	-	-	1, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 30, 32, 35, 37, 38, 39, 40, 43, 44, 45, 47, 48, 49, 50, 52, 53, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Sus scrofa	Pig	Introduced	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 54, 55, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68, 69
	Tachyglossus aculeatus	Short-beaked echidna	Native	-	-	1, 2, 12, 16, 35, 39, 44, 45, 47, 52, 56, 60, 65, 69
	Trichosurus caninus	Mountain brushtail possum	Native	-	-	61, 67, 68
	Trichosurus cunninghami	Mountain brushtail possum	-	-	-	35, 64, 69
	Trichosurus vulpecula	Common brushtail possum	Native	-	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
	Vespadelus darlingtoni	Large forest bat	-	-	-	45
	Vespadelus sp	-	-	-	-	2, 15, 23, 25, 48, 52, 59, 60, 61, 64, 68
	Vombatus ursinus	Common wombat	Native	-	-	1, 2, 4, 5, 6, 7, 8, 10, 12, 17, 18, 19, 20, 23, 24, 26, 30, 32, 35, 38, 39, 40, 44, 45, 47, 48, 49, 52, 53, 55, 56, 59, 60, 61, 62, 64, 65, 66, 67, 68, 69
	Vulpes vulpes	Red fox	Introduced	-	-	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67
	Wallabia bicolor	Swamp wallaby	Native	-	-	1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 32, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 54, 55, 56, 57, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
Reptiles	*Carinascincus sp*	-	-	-	-	11, 13, 23, 26, 48
	Chelodina longicollis	Eastern long necked turtle	Native	-	-	2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 15, 16, 18, 20, 21, 22, 23, 25, 27, 28, 30, 31, 32, 33, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 55, 57, 59, 62, 63, 65, 66, 67, 68
	Christinus marmoratus	Marbled gecko	Native	-	-	2, 5, 12, 13, 15, 18, 23, 25, 48, 57, 62
	Emydura macquarii	Southern river turtles	Native	Critically Endangered	-	2, 12, 15, 24, 28, 33, 37, 38, 40, 44, 48, 49, 62, 66
	Emydura sp	-	-	-	-	2, 23, 27, 28, 33, 37, 38, 45, 48, 62
	Eulamprus sp	-	-	-	-	42
	Eulamprus tympanum	Southern water-skink	Native	-	-	4, 15, 31, 51, 56, 61
	Lampropholis delicata	Dark-flecked garden sunskink	Native	-	-	2, 18, 27, 41, 44, 59, 66, 67
	Lampropholis guichenoti	Pale-flecked garden sunskink	Native	-	-	5, 13, 17, 18, 19, 20, 23, 25, 27, 31, 32, 40, 43, 44, 45, 46, 48, 49, 51, 52, 54, 59, 63, 64, 66, 67
	Lampropholis sp	-	-	-	-	21
	Morethia sp	-	-	-	-	31
	Pseudemoia entrecasteauxii	Southern grass skink	Native	-	-	17, 22, 40, 46, 69
	Saproscincus mustelinus	Weasel skink	Native	-	-	2, 3, 5, 12, 13, 15, 17, 18, 21, 23, 25, 27, 40, 43, 44, 45, 48, 49, 52, 54, 56, 57, 66
	Scincidae sp	-	-	-	-	5
	Testudines sp	-	-	-	-	38, 66
	Tiliqua scincoides	Eastern blue-tongue lizard	Native	-	Critically Endangered	16, 18, 22, 37, 38, 45, 48

Subcatchment codes used in Table A70.

Subcatchment	Code
Bass River	1
Bayside	2
Blind Creek	3
Boyd Creek	4
Brushy Creek	5
Bunyip Lower	6
Bunyip River Middle and Upper	7
Cardinia, Toomuc, Deep and Ararat Creeks	8
Cherry Creek	9
Corhanwarrabul, Monbulk and Ferny Creeks	10
Dalmore Outfalls	11
Dandenong Creek Lower	12
Dandenong Creek Middle	13
Dandenong Creek Upper	14
Darebin Creek	15
Deep Creek Lower	16
Deep Creek Upper	17
Diamond Creek (Rural)	18
Diamond Creek (Source)	19
Emu Creek	20
Eumemmerring Creek	21
French and Phillip Islands	22
Gardiners Creek	23
Jacksons Creek	24

Subcatchment	Code
Kananook Creek	25
King Parrot and Musk Creeks	26
Koonung Creek	27
Kororoit Creek Lower	28
Kororoit Creek Upper	29
Lang Lang River	30
Laverton Creek	31
Lerderderg River	32
Little River Lower	33
Little River Upper	34
Little Yarra River and Hoddles Creek	35
Lollypop Creek	36
Maribyrnong River	37
Merri Creek Lower	38
Merri Creek Upper	39
Moonee Ponds Creek	40
Mornington Peninsula North-Eastern Creeks	41
Mornington Peninsula South-Eastern Creeks	42
Mornington Peninsula Western Creeks	43
Mullum Mullum Creek	44
Olinda Creek	45
Parwan Creek	46
Plenty River (Source)	47
Plenty River Lower	48
Plenty River Upper	49
Skeleton Creek	50
Steele Creek	51
Steels and Pauls Creek (Rural)	52
Steels and Pauls Creek (Source)	53
Stony Creek	54
Stringybark Creek	55
Tarago River	56
Taylors Creek	57
Toolern Creek	58
Watsons Creek	59
Watts River (Rural)	60
Watts River (Source)	61
Werribee River Lower	62
Werribee River Middle	63
Werribee River Upper	64
Woori Yallock Creek	65
Yarra River Lower	66
Yarra River Middle	67
Yarra River Upper (Rural)	68
Yarra River Upper (Source)	69

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