2022 Healthy Waterways Strategy Fish Survey

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Melbourne Water

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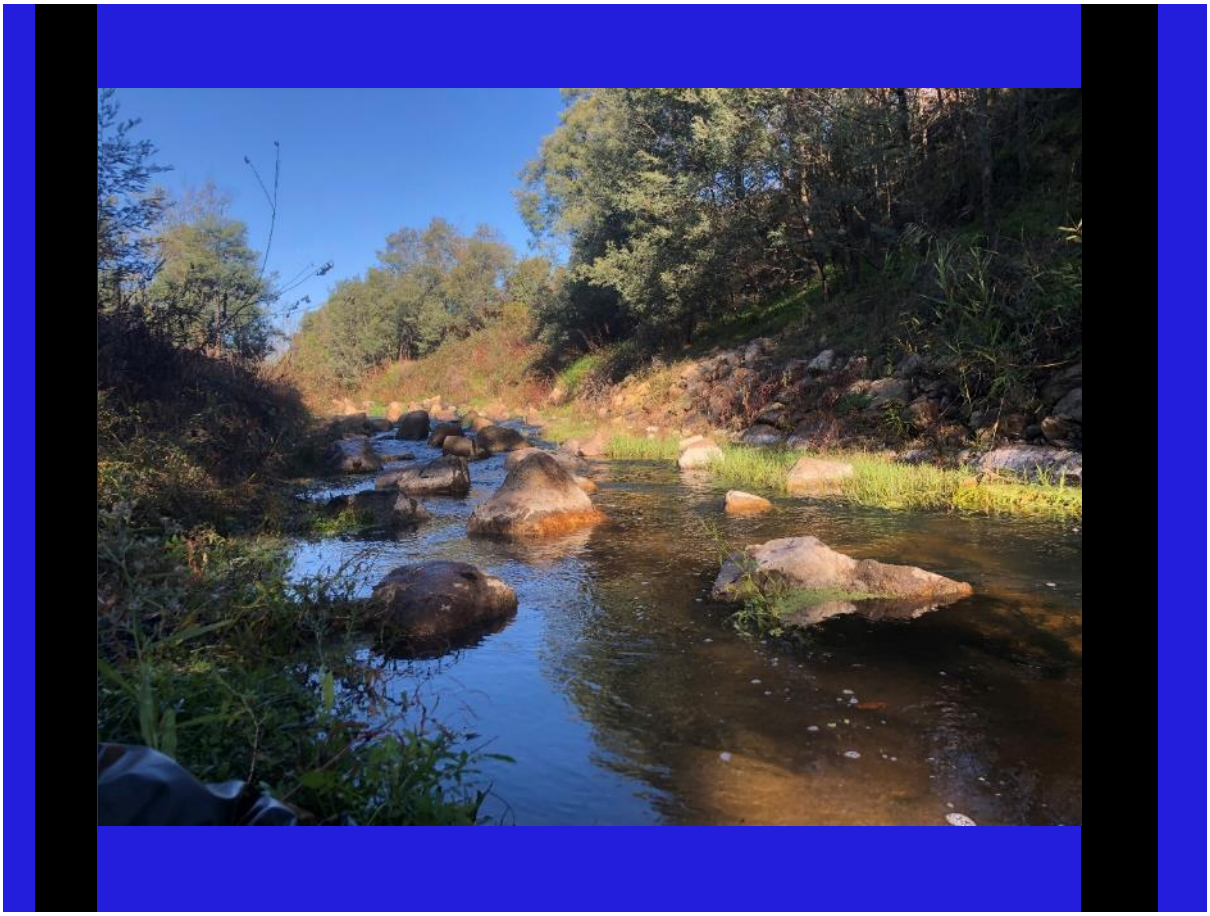
19 January 2023



2022 Healthy Waterways Strategy Fish Survey

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Executive summary

The Healthy Waterways Strategy (HWS) 2018-28 sets out a strategy for managing the health of rivers, wetlands and estuaries in the Melbourne Water Management Region (Port Phillip and Westernport regions). To assess progress against HWS objectives and to understand the success of their investment programs, MW collect data to inform annual reporting. Data gathering for such reporting follows the Monitoring Evaluation Reporting and Improvement (MERI) framework. The MERI was developed to provide guidance for data collection and reporting so that Melbourne Water (MW) can conduct condition reporting of key values and conditions, track progress towards objectives, and evaluate and understand the effectiveness of management actions so that they can improve decision making regarding catchment management. One of the key ecological values outlined in the HWS is fish communities. To achieve this monitoring aim, MW engaged Jacobs to undertake fish surveys across the Werribee, Maribyrnong, Yarra, Dandenong, and Western Port catchments within the Melbourne Water Management Region and to report the findings for later analysis in line with the MERI framework.

Surveys were undertaken at 24 sites across the Werribee (4 sites), Maribyrnong (3 sites), Yarra (7 sites), Dandenong (2 sites), and Western Port (8 sites) catchments within the Melbourne Water Management Region in late Autumn, between the 2-25th May 2022. Eight of the priority riverine species outlined in the MERI, were present at one or more of the study sites, which provides support for their choice as monitoring locations: Australian grayling (*Prototroctes maraena*), Common galaxias (*Galaxias maculatus*), Ornate galaxias (*Galaxias ornatus*), River blackfish (Gadopsis marmoratus), Short-finned eel (*Anguilla australis*), Southern pygmy perch (*Nannoperca australis*), Tupong (*Pseudaphritis urvillii*), and Yarra pygmy perch (*Nannoperca obscura*).

Notable non-detections relative to expectations included Dwarf galaxias (*Galaxias pusilla*) that were not captured in Balcombe Creek or Cardinia Creek where they were expected to be present. Short-headed lamprey (*Mordacia mordax*) was not caught in the Western Port, Yarra, or Werribee catchment sites where they were thought likely to be. Australian grayling was not found in the Maribyrnong River or Cardinia Creek where they may have been present, and Australian mudfish were not detected on the Yarra River below Dights Falls, although they have not been detected there for many years. Furthermore, only one Yarra pygmy perch was captured at the upper Deep Creek site (DPW-13586-2), that lies within the only population of the species in the Melbourne Water Management Region. We suggest, based on the results, that the Balcombe Creek (BLC-3709-0), lower Cardinia Creek (CDC-10600-4), and upper Deep Creek site (DPW-13586-2) may not be optimally placed as the priority species present in those areas were not present, or were in very low numbers.

We conducted an analysis of catchment condition based on species richness and nativeness indices, which indicated that each of the MW catchments are in moderate condition. We also investigated various health metrics related to non-migratory priority species. These results showed that YOY and 1+ Ornate galaxias were present in the Yarra catchment, suggesting successful recruitment is occurring and individuals are surviving to reproductive age. However, only 1+ fish were observed in the Werribee catchment at the Lerderderg Gorge site (LER-22832-7). Nealy half of the fish at this site were also infected by parasites. Together these results indicating poor health and an unsuccessful breeding season. At almost every catchment where River blackfish, Southern pygmy perch, and Australian grayling were recorded, both YOY and 1+ fish were present, again suggesting successful recruitment during the last breeding season and that individuals are surviving to reproductive age.

Based on the results we recommend the following actions:

- Review survey data from Cardinia Creek to assess the impact of the drop structure and fishway near Thompson Road on upstream fish passage. Our current hypothesis, based on surveys since the construction of the fishway, is that upstream movement of Australian grayling is impeded.
- Add to or move current survey sites on Cardinia Creek to improve representation of Dwarf galaxias and Australian grayling. This may include adding or moving a site to a tributary or wetland that better represents Dwarf galaxias habitat, or moving or adding a site below the Thompson Road fishway where upstream movement of Australian grayling is known to be unimpeded. Having sites above and below the fishway will allow for upstream/downstream comparison and confirmation of its impact on fish movement, which could inform remediation actions.

- Investigate moving the Balcombe Creek site into the Briars Park, or another other suitable catchment in the Western Port catchment area where Dwarf galaxias are present. This would include a reconnaissance trip to potential sites prior to surveys next year.
- Review data after second year of sampling to see if additional survey effort may be required (e.g. fyke netting) to capture target species.
- Review other MW fish survey projects to integrate results and to help inform site locations such as on Upper Deep Creek.

In summary, the aims of the project were achieved. The results provide a suitable baseline to compare against future surveys and the data is recorded in such a way that it can be analysed in line with the MERI. Finally, our brief analysis aids with interpretation of the data, providing some general insight into catchment condition and the status of the non-migratory priority species.

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1. Introduction

The Healthy Waterways Strategy 2018-28 sets a long-term vision for managing the health of rivers, wetlands and estuaries in the Port Phillip and Westernport region. As waterway managers in the region, Melbourne Water (MW) are responsible for monitoring the progress of the Healthy Waterways Strategy (HWS).

To assess progress against HWS objectives and to understand the success of their investment programs, MW collect information to inform annual reporting, as well as mid-term (2022) and end-of- strategy (2026) reviews. A key component of the information gathering and reporting process is the Monitoring Evaluation Reporting and Improvement framework (MERI) (King *et al.* 2020). The framework is in place to guide the monitoring programs which are required to inform the HWS reporting and reviews. The MERI objective is to assess if the performance objectives and targets for each major catchment are being achieved. A key success measure is the state or condition of key values (birds, fish, frogs, etc.), and whether each key value is achieving its projected trajectories, objectives and targets. As one of the key waterway values set out in the HWS, monitoring programs have been put in place to track the state and trajectory of fish values in the region. This project has been established to complement other programs measuring progress against the objectives and targets set for fish in the region.

MW engaged Jacobs to undertake fish surveys across the Port Phillip and Westernport regions. The aim of the project was to undertake fish surveys across the Werribee, Maribyrnong, Yarra, Dandenong, and Western Port catchments withing the Melbourne Water Management Region and to report the findings for later analysis in line with the MERI framework.

2. Methods

2.1 Survey sites and timing

Surveys were undertaken at 24 sites across the Werribee (4 sites), Maribyrnong (3 sites), Yarra (7 sites), Dandenong (2 sites), and Western Port (8 sites) catchments within the Melbourne Water Management Region in late Autumn, between the 2-25th May 2022. Flows were stable and weather conditions were suitable for fish sampling (Appendix A).

Most sampling locations were selected by MW on the basis of proximity to previous sampling sites and fish records, known or likely habitat for fish, the representative nature of a site in the broader system, location relative to fish barriers that may impact fish population and movement, or proximity to previous eDNA and water quality sampling sites. These sites were refined by Jacobs and MW prior to surveys commencing based on a variety of criteria including site access, the habitat present (where known) and other factors such as prior surveys and known barriers to fish movement. After consultation between Jacobs and MW, an additional site was added at Werribee Gorge as it was known to be important drought refuge and home to a significant population of River blackfish (*Gadopsis marmoratus*), but it has not been surveyed since the Millennium Drought. A full list of site codes, descriptions, and coordinates (at the downstream end of study reach) are listed in Table 1 and visually presented in Figure 1.

During sampling, the location coordinates of the upstream and downstream ends of the sampling reach were recorded to ensure that study reach can be accurate relocated during subsequent surveys (see Appendix A for both downstream and upstream coordinates).

Table 1 Study sites and locations. Words in bold indicate site names used in this report.

Site code	Catchment	Site description	Longitude	Latitude
LER-22832-7	Werribee River	**Lerderderg Gorge**, Lerderderg River, Mackenzies Flat Picnic Area	144.42484	-37.61468
WERRIBEE GORGE	Werribee River	**Werribee Gorge**, upstream of Meikles Point picnic area	144.36253	-37.67258
WER-30289-9	Werribee River	**Middle Werribee River**, Werribee Vale Road, downstream of diversion weir	144.37922	-37.67916
WER-138085-6	Werribee River	**Lower Werribee River**, Werribee River, downstream of lower diversion weir, off Redgum Close	144.64074	-37.88260
DPW-13586-2	Maribyrnong River	**Upper Deep Creek**, Deep Creek at Musteys Bridge	145.09347	-38.21579
DPW-63085-7	Maribyrnong River	**Lower Deep Creek**, Deep Creek, Konagaderra Bridge Reserve, off Konagaderra Rd	144.84959	-37.55105
MRB-130320-2	Maribyrnong River	**Maribyrnong River**, off Flora Street, Keilor, 100m d/s of Calder Fwy crossing	144.83980	-37.72097
PLE-16938-4	Yarra River	**Plenty River**, accessed from parklands off Laurel Street	145.12621	-37.51481
ART-4232-0	Yarra River	**Diamond Creek**, below confluence with Arthurs Creek, upstream of Arthurs Creek Road	145.19173	-37.63724
NCC-3576-4	Yarra River	**New Chum Creek**, downstream from Blackwoods Road crossing	145.49809	-37.61969
YAR-42313-7	Yarra River	**Upper Yarra River** at reservoir gate	145.87355	-37.67416

Site code	Catchment	Site description	Longitude	Latitude
YAR-374049-3	Yarra River	**Lower Yarra River**, immediately downstream of Dights Falls	145.00099	-37.79699
HDL-2685-5	Yarra River	**Hoddles Creek**, Hoddles Creek Bushland Reserve, upstream of Glenview Road bridge crossing	145.58481	-37.79669
WOY-8964-3	Yarra River	**Woori Yallock Creek**, off Macclesfield Road	145.50353	-37.81328
DNG-13753-1	Dandenong Creek	**Upper Dandenong Creek**, downstream end at High Street Road Bridge	145.19189	-37.87656
DNG-31881-2	Dandenong Creek	**Lower Dandenong Creek**, upstream of fishway, off Perry Road	145.18458	-38.02988
BLC-3709-0	Western Port	**Balcombe Creek**, immediately upstream of Wooralla Drive bridge	145.06486	-38.26284
CDC-7795-5	Western Port	**Upper Cardinia Creek**, upstream of Luke Place bridge	145.38379	-38.01169
CDC-10600-4	Western Port	**Lower Cardinia Creek**, at environmental reserve off Pebblestone Circuit	145.38149	-38.08553
BNY-11161-3	Western Port	**Upper Bunyip River**, Bunyip State Forest, upstream from start of Freemans Mill Track, off Aqueduct Track	145.73629	-37.97040
BNY-70608-3	Western Port	**Lower Bunyip River**, off Main Drain Road, just downstream of Eleven Mile Road	145.73817	-38.10204
TAR-22224-5	Western Port	**Tarago River**, Tarago River Picnic Point Reserve, off Princes Way	145.81177	-38.08323
LNG-29460-1	Western Port	**Lang Lang River** in stream reserve off Soldiers Road	145.61047	-38.23992
BAS-22307-6	Western Port	**Bass River**, private property immediately upstream of Grantville-Glen Alvie Road bridge	145.56327	-38.43674

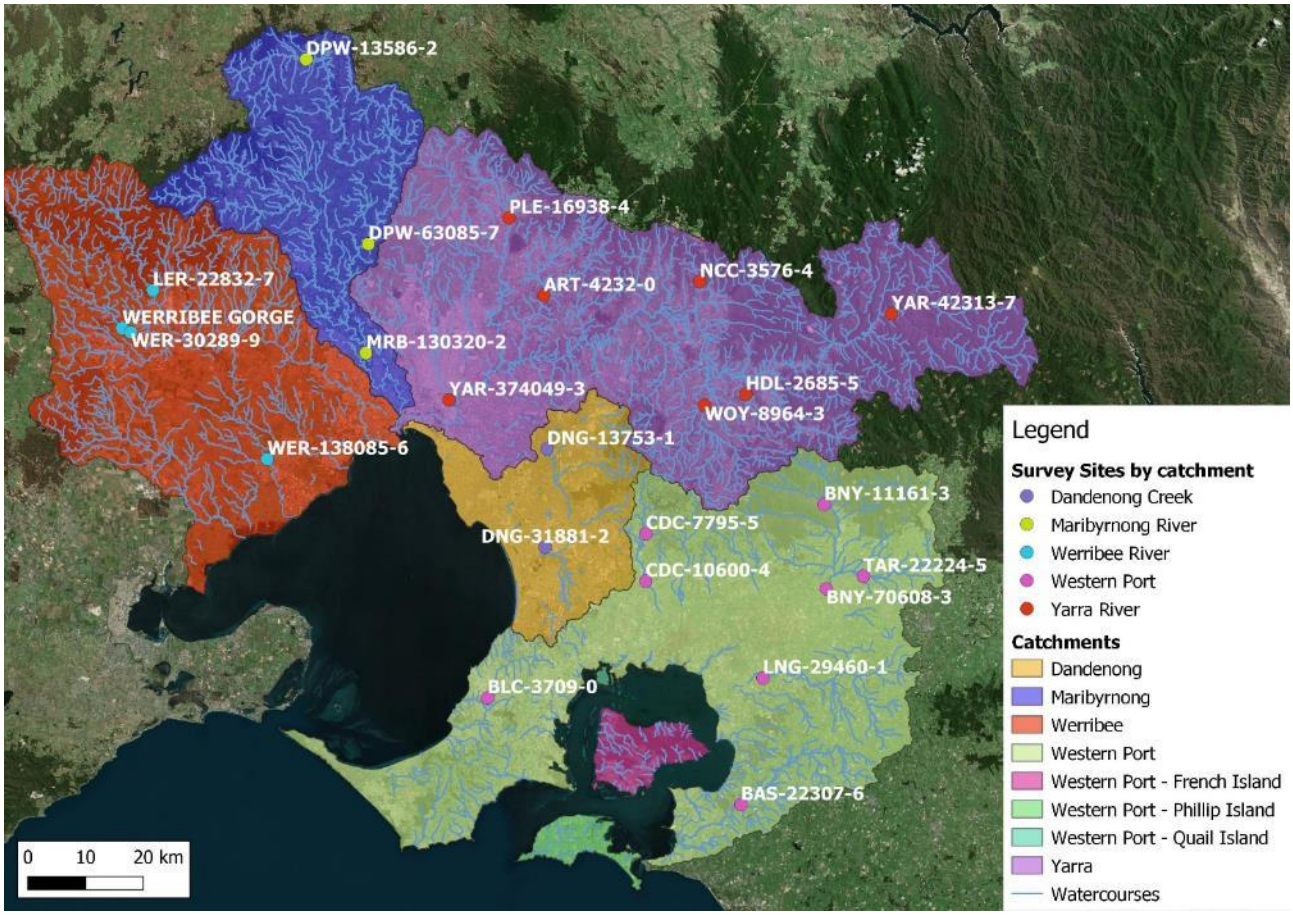

Figure 1 The location of fish survey sites (dots) within each of the major catchments within the Melbourne Water Management Region

2.2 Recording of water quality and physical habitat

An instream habitat assessment was undertaken at all sites surveyed following the specified MW format (Appendix A). This assessment included in-situ measurement of water quality parameters and estimation of biological and physical attributes (e.g. wetted instream cover, riparian shading, aquatic vegetation, substrate composition, flow and depth).

Water quality measurements were taken at each site prior to other surveys being undertaken using a calibrated YSI ProPlus water quality meter. Water quality variables measured were:

- Temperature
- pH
- Conductivity
- Turbidity
- Specific Conductivity
- Dissolved Oxygen (mg/L and % saturation)

In line with the project brief, this data is summarised here and broadly discussed in such a way to allow for assessment of the physical conditions that may affect sampling efficiency and fish condition at each site. It may also be used as a point of reference when interpreting changes in fish communities during any subsequent surveys.

2.3 Fish surveys

2.3.1 Data collection

The fish survey aimed to collect the following variables from each site:

- species present
- number of each species caught
- lengths of individual fish (if necessary, a sub-sample of 50 fish per site/ per species/ per method was measured)
- health and condition of individuals (parasites, lesions, diseases, and abnormalities (sub-sampled where necessary).

All fish captured were identified, weighed and measured prior to release. Fish that were observed but not captured were also recorded.

2.3.2 Electrofishing

Fish monitoring was conducted using an E-Fish backpack electrofisher following Sustainable Rivers Audit methods (MDBC 2008). In brief, 8 x 150 second power-on electrofishing shots were made, moving in an upstream direction over a continuous stream reach, with all representative habitat types being fished. Sampling effort (pulse time on), and voltage and ampere settings were recorded (Appendix A).

Electrofishing was conducted by a suitably qualified senior electrofisher operator and an experienced assistant. All electrofishing was conducted in accordance with the Australian Code of Electrofishing Practice (NSW Fisheries 1997).

2.3.3 Bait traps

At each site 10 bait traps were deployed in water less than 1 m depth. Traps were not baited and were set in slow flowing or backwater areas independent from electrofishing. Traps were set for the duration of the site visit, typically being cleared after 2.5 hours. Fish captures were recorded for each individual trap.

2.3.4 Fyke nets

One site in the Dandenong Creek catchment, Lower Dandenong Creek (DNG-31881-2), had large areas of moderately deep (0.5-1.0m) backwater sections that could not be effectively electrofished, so fyke nets were set overnight to supplement electrofishing and bait trapping. Fyke nets passively capture fish that encounter the wing structure at the entrance and are directed through a set of funnels into a chamber called a cod end. Fyke nets used on this project were 6m long and covered in 2mm knotless mesh netting with 2mm spaces between rows. Each net had a 60cm wide, D-shaped entrance. In line with Animal Ethics requirements, a 50mm mesh grid was fitted to the first ring behind the D in each fyke to exclude large bycatch such as turtles and platypus. The grids allowed most size classes of fish to pass into the fyke nets but would have prevented larger European carp (C*yprinus carpio*), Roach (*Rutilus rutilus*), Tench (*Tinca tinca*), and Redfin perch (*Perca fluviatilis*) (all exotic species) from entering. A single 5 m wing with a 60 cm drop extended outward from the centre of the entrance. The top of the wing was fitted with floats, while the bottom of each wing was threaded with a leaded cord so that the wing created a barrier.

2.3.5 Data analysis and presentation

The MERI outlines a number of metrics, that can be informed by the type of data collected in this project, that provide insight into community and species level health at individual monitoring sites and more broadly across the MW catchments. As the scope of this project is limited to a more general overview of the results of the survey, we only present what we consider to be the key findings that help with the overall interpretation of results.

2.3.5.1 Community level metrics

At the community level we focussed on species richness and nativeness (i.e. the proportion of native species compared to exotic species), using an adaptation of the catchment-level metrics of condition presented in the MERI for guide our interpretation of the results (Table 2). Notably, we did not include an analysis of observed versus expected species richness. Furthermore, we used proportional abundance rather than biomass as a measure of nativeness as we considered it a more reliable measurement; eels (often the heaviest native fish) are very difficult to weigh in the field and can greatly skew biomass results. We combined the fish community condition scores by assigning values of 1-5 (1 = very low, 5 = very high) to each metric and calculating the overall median score. This is to provide an overall catchment condition rating, but we note that this is not a complete assessment, and the results should be interpreted accordingly.

Table 2 Metrics for assessing fish community condition at the catchment scale (adapted in part from King *et al.* 2020).

Metric	Very high	High	Moderate	Low	Very low
Species richness	>8 native species	7-8 native species	4-6 native species	2-3 native species	<2 native species
Nativeness (species richness)	>90% native species	70-89% native species	50-69% native species	30-49% native species	<30% native species
Nativeness (abundance)	>90% native biomass	70-89% native biomass	50-69% native biomass	30-49% native biomass	<30% native biomass

2.3.5.2 Species level metrics

At the species level, we focussed on priority non-migratory species outlined in the MERI (Table 3). These non-migratory species exist in isolated populations within the MW management region and are each experiencing population decline. Being non-migratory, their health reflects the habitat condition in the direct vicinity of the study reach. As such we chose to focus on them in this instance. Specifically, we report on species abundance, health (e.g. parasites, fin damage), and evidence of reproduction (i.e. presence of young-of-year fish (YOY)).

Of the priority species captured, we considered YOY fish to be:

- Ornate galaxias ≤ 50mm (Hammer and Beitzel 2018)
- River blackfish ≤ 80mm (Sanger 1986)
- Yarra pygmy perch ≤ 48mm (Wedderburn *et al.* 2019)
- Southern pygmy perch ≤ 36mm (Humphries 1995)

Table 3 List of priority non-migratory fish species for monitoring in the MW management region and rationale for their selection (adapted in part from King et al. 2020).

Common name	Scientific name	Current conservation status	Rationale
Australian mudfish	*Neochanna cleaveri*	IUCN: Endangered, unknown FFG: Threatened	Threatened species.
Dwarf galaxias	*Galaxiella pusilla*	IUCN: Endangered, decreasing FFG: Threatened	Threatened species. Representative of non-migratory riverine life history.
Ornate galaxias	*Galaxias ornatus*	IUCN: Least concern, decreasing	Representative of non-migratory riverine life history.
River blackfish	*Gadopsis marmoratus*	IUCN: Least concern, decreasing	Representative of non-migratory riverine life history. Risk of climate change impact.
Southern pygmy perch	*Nannoperca australis*	IUCN: Near threatened, decreasing	Representative of non-migratory wetland life history.
Yarra pygmy perch	*Nannoperca obscura*	IUCN: Endangered, decreasing EPBC: Vulnerable FFG: Threatened	Threatened species.

3. Results

3.1 Water quality and physical habitat

Water quality and physical habitat measurements taken at each study sites are summarised in Table 4. At all sites conditions were suitable for fish sampling (i.e. fishing was not impacted by high flows or inclement weather) and are considered characteristic at the time of sampling. Given that the MW catchments drain a highly modified urban landscape, it is a given that the sites themselves will reflect such land-use change to a degree. However, comment is made when sites show signs of significant degradation that would be expected to have a significant impact on what species may be able to persist there, and fishing efficiency in general.

Sites within the Werribee catchment were considered typical of the catchment in terms of habitat condition. All sites had slow to medium flow, and displayed a range of substrate types, in-stream cover, native riparian vegetation, and slow/deep (e.g. pools) to shallow/fast (e.g. riffles) mesohabitat types.

Sites within the Maribyrnong catchment varied notably in condition. For instance, Upper Deep Creek (DPW-13586-2) was quite degraded with low dissolved oxygen (51.4 %, 5.6 mg/L), no riparian trees, and bed sediment dominated by mud and silt. Although, emergent, floating and submergent vegetation growth was very prominent at the sites and it was fenced off from cattle. The other two sites (Lower Deep Creek [DPW-63085-7] and the Maribyrnong River at Keilor [MRB-130320-2]) exhibited water quality parameters that were at or close to ANZECC 2000 guidelines, slow to medium flow, and a range of substrate types, in-stream cover, native riparian vegetation, and slow/deep (e.g. pools) to shallow/fast (e.g. riffles) mesohabitat types.

Yarra catchment sites had slow to medium flow and were mostly considered typical of the catchment in terms of water quality parameters, riparian vegetation, and the variety of physical habitat available. The site on the Plenty River (PLE-16938-4) was notably degraded with very low dissolved oxygen levels (23.0 %, 2.7 mg/L) that were close to anoxic (anoxic at 2.0 mg/L), and he bed sediment of the slow flowing pool habitat was also entirely mud and silt. Although, there was prominent macrophyte growth providing good fish habitat.

Both of the Dandenong catchment sites were heavily modified. The lower site (DNG-31881-2) was situated in an industrial park, immediately upstream of the Pillars Crossing fishway. The channel itself had been straightened and native riparian vegetation removed. The bed sediment was predominantly mud and silt and sand, but a rock-fishway had been installed at the site which provided cover in the form of large rocks and riffle habitat which was unique to the stream reach. Flow was slow to medium, but there were large backwaters with no flow. The upper catchment site (DNG-13753-1) was a small stream reach (average 2.5 m wide) with a mud and silt base and the riparian zone was a mix of native and exotic tree and grass species. Otherwise, a reasonable amount and diversity of cover and mesohabitats were available.

The Western Port catchment region covers a large area and six individual catchments outlined below.

- The Balcombe Creek catchment site (BLC-3709-0) was in particularly poor condition with low dissolved oxygen (50.0 %, 5.2 mg/L), relatively high turbidity (46.6 NTU), and bed sediment dominated by mud, silt and clay. The riparian zone was overgrown with blackberry (*Rubus* sp.) and the stream itself was thick with emergent macrophytes (*Typha* sp.) which limited the effectiveness of the electrofishing. As such only five electrofishing replicates were conducted at the site. It's important to note that while such conditions reflect habitat degradation, they may be suitable for some native species such as Dwarf galaxias (*Galaxiella pusilla*).

- The banks of the lower Cardinia Creek site (CDC-10600-4) were also overgrown with blackberry, making access difficult. The stream reach also contained several deep holes which couldn't be electrofished and couldn't be safely navigated past. As such, only six electrofishing shots were conducted before the creek entered private property. Dip netting was conducted as well. The site also had notably high turbidity (54.2 NTU) that exceeded the ANZECC (2000) guideline for lowland rivers of 50 NTU which would be expected to impact on fishing efficiency.

- The upper Bunyip River site (BNY-11161-3) had a notably high pH of 8.9, that exceeded the ANZECC (2000) guideline for upland rivers of 7.5.

- Finally, The Bass River site (BAS-22307-6) had notably low dissolved oxygen (25.0 %, 2.7 mg/L) and bed sediment was dominated by mud, silt, and clay. The riparian zone was dominated by exotic willows (*Salix* spp.) that were intruding on the stream.

Other than these notable exceptions, the sites exhibited water quality parameters that were within an acceptable range, a range of substrate types, in-stream cover, native riparian vegetation, and slow/deep (e.g. pools) to shallow/fast (e.g. riffles) mesohabitat types. Most sites had slow to medium flow, although the upper Bunyip River site was running fast at the time of sampling.

Table 4 Water quality and physical habitat recordings at each study site. Physical habitat observations are presented as the percent of electrofishing shot reaches where they those habitat features were observed (e.g. boulders were present where 4 out of 8 (50%) electrofishing shots were conducted). Velocity is given as (Fast = F, Medium = M, Slow = S, or No Flow = NF).

	Werribee River				Maribyrnong River			Yarra River							Dandenong Creek		Western Port							
	LER-22832-7	WERRIBEE GORGE	WER-30289-9	WER-138085-6	DPW-13586-2	DPW-63085-7	MRB-130320-2	PLE-16938-4	ART-4232-0	NCC-3576-4	YAR-42313-7	YAR-374049-3	HDL-2685-5	WOY-8964-3	DNG-13753-1	DNG-31881-2	BLC-3709-0	CDC-7795-5	CDC-10600-4	BNY-11161-3	BNY-70608-3	TAR-22224-5	LNG-29460-1	BAS-22307-6
Water Quality																								
Temp. (°C)	10.4	11.8	13.4	11.8	11.2	10.8	10.4	8.6	12.1	11.5	9.8	10.8	11.4	9.4	13.6	11.0	13.8	13.3	15.4	12.6	12.8	14.8	10.3	12.3
pH	7.8	7.3	7.6	7.3	7.5	7.2	7.3	7.7	7.1	7.3	8.0	7.4	7.7	7.1	7.6	7.0	7.3	7.5	7.2	8.9	7.2	7.3	6.7	6.9
Cond. (µS.cm)	160	504	503	1503	643	1168	1234	247	650	166	57.9	231	104	141	263	423	443	160	324	83.8	178	349	707	611
Turbid. (NTU)	2.0	5.0	12.6	11.0	5.9	9.1	19.4	17.7	35.4	13.4	4.4	20.2	12.5	12.7	33.8	18.3	46.6	15.4	54.2	18.0	14.1	14.3	6.6	1.9
DO (mg/L)	7.9	8.2	8.5	9.0	5.6	6.4	9.2	2.7	6.5	7.8	8.4	9.7	7.7	8.9	5.6	8.0	5.2	7.1	6.8	6.5	7.7	6.5	10.2	2.7
DO (%)	70.5	76.1	82.1	84.9	51.4	59.3	89.0	23.0	60.2	71.5	74.3	88.2	71.4	77.9	63.8	72.8	50.0	67.6	67.8	60.9	72.0	64.5	90.8	25.0
Substrate																								

	Werribee River				Maribyrnong River			Yarra River							Dandenong Creek		Western Port							
Bed-rock	25	62.5	100	0	0	12.5	0	0	100	87.5	62.5	0	0	0	0	0	0	0	0	0	0	0	0	0
Boulder (>120 mm)	25	100	0	100	0	12.5	12.5	0	0	0	62.5	100	100	0	0	62.5	0	0	0	12.5	0	12.5	62.5	0
Cobble (60-200 mm)	100	100	0	62.5	0	25.0	100	0	0	0	100	100	100	0	0	62.5	0	0	0	12.5	0	25	37.5	0
Gravel (2-60 mm)	100	75	0	62.5	0	37.5	100	0	100	0	100	0	100	0	0	0	0	0	50	87.5	100	100	37.5	0
Sand (0.6-2 mm)	100	75	0	62.5	0	100	100	0	100	100	100	0	100	0	0	62.5	0	100	50	100	100	100	87.5	0
Mud/ silt (0.002 -0.6 mm)	100	100	100	0	100	62.5	12.5	100	100	100	0	0	100	100	0	37.5	100	100	100	0	0	100	50	100
Clay (<0.002 mm)	0	0	0	0	0	0	12.5	0	100	0	0	0	0	100	100	0	100	100	100	0	0	100	37.5	100
Plants																								
Native trees	100	62.5	100	100	0	100	37.5	100	100	100	100	25	100	100	100	0	80	100	100	100	100	100	100	0
Exotic trees	0	0	100	0	0	0	100	0	0	0	0	0	0	0	100	0	0	0	100	0	100	0	50	100

	Werribee River				Maribyrnong River			Yarra River							Dandenong Creek		Western Port							
Native shrubs	100	100	100	62.5	100	100	100	37.5	100	100	100	0	100	100	62.5	0	80	100	100	100	0	100	75	0
Riparian grass	100	100	100	62.5	100	100	100	100	100	100	100	100	100	100	100	62.5	80	100	16.7	100	0	100	87.5	100
Floating macro.	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	60	0	0	0	0	0	37.5	100
Emerg macro.	50	100	100	50.0	100	75.0	62.5	100	25	0	0	25	62.5	0	87.5	0	60	100	100	100	62.5	62.5	37.5	0
Submerged macro.	0	37.5	0	0	100	0	25.0	0	0	0	0	37.5	0	50.0	25.0	0	60	0	0	0	0	0	100	0
Filame-ntous algae	0	0	37.5	100	0	0	100	0	0	0	0	25	0	0	100	87.5	60	0	0	0	0	0	100	100
Suspended algae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.5	0	0	0	0	0	0	0	0
Biofilms	100	100	100	100	100	100	100	100	100	100	0	100	100	0	87.5	62.5	60	0	100	100	0	100	100	100
Cover																								
Rock	100	100	37.5	100	0	25.0	87.5	0	0	100	100	100	100	0	25.0	87.5	0	0	0	100	0	25	50	0
Timber	100	62.5	0	62.5	0	100	12.5	100	100	100	100	0	100	100	87.5	0	60	87.5	100	100	0	100	50	100
Under-cuts	0	25	37.5	0	0	25.0	12.5	0	100	0	62.5	0	100	100	12.5	0	40	100	100	100	100	62.5	25	0

	Werribee River				Maribyrnong River			Yarra River							Dandenong Creek		Western Port							
Leaf litter	100	25	0	0	0	62.5	0	100	0	0	87.5	0	0	12.5	0	0	60	0	0	100	0	0	12.5	100
Macr-ophytes	62.5	75	37.5	37.5	100	62.5	75.0	100	25	0	0	0	62.5	0	0	0	80	100	0	0	62.5	0	87.5	0
Mesohabitat																								
Pools	25	62.5	50	37.5	100	62.5	25.0	100	50	37.5	12.5	0	37.5	12.5	100	62.5	0	0	0	0	25	0	37.5	100
Run	75	37.5	50	0	0	37.5	0	0	50	87.5	100	0	62.5	100	50.0	0	80	100	100	100	100	100	100	100
Riffle	12.5	37.5	0	37.5	0	0	75.0	0	0	12.5	25.0	0	12.5	0	12.5	62.5	0	0	0	0	0	0	75	0
Rapid	0	0	0	0	0	0	0	0	0	0	0	37.5	0	0	0	0	0	0	0	0	0	0	62.5	0
Back-water	0	0	0	37.5	0	0	12.5	0	0	0	12.5	62.5	0	0	0	25.0	0	0	0	0	0	0	0	0
Veloc-ity	S	S-M	S-M	S-M	NF	M	S	S	S-M	S-M	S-M	S, F	S-M	S	S-M	NF-M	S-M	M	M	F	M-F	M	S-M	S
Aver. wetted width (m)	20	5.5	6.9	9.0	17.5	4.3	13.8	5.0	5.1	2.4	6.1	24.4	5.0	4.3	2.5	28.8	4.9	2	1.5	4	5	3.4	4.4	3
Aver. depth (m)	0.62	0.60	0.50	0.44	0.68	0.65	0.31	0.50	0.61	0.39	0.61	0.41	0.46	0.70	0.54	0.26	0.33	0.50	1.00	0.50	0.50	0.50	0.36	0.80
Total dist. travel. (m)	120	120	120	110	120	120	102	120	120	120	250	77	120	195	90	106	40	120	120	175	160	120	95	160

3.2 Fish communities

3.2.1 Werribee catchment

The survey of the four Werribee catchment sites captured a total of 167 fish from 11 species (seven native and four exotic) (Table 5). By far the most abundant species overall were Common galaxias (*Galaxias maculatus*; 67 fish), followed by Ornate galaxias (*Galaxias ornatus*; 17 fish), River blackfish (15 fish), Redfin perch (14 fish), Roach (9 fish), Eastern gambusia (*Gambusia holbrooki*; 8 fish), Tench (8 fish), Flathead gudgeon (*Philypnodon grandiceps*; 7 fish), Tupong (*Pseudaphritis urvilli*; 2 fish), and Smelt (*Retropinna semoni*; 1 fish).

The Lerderderg River site (LER-22832-7) and Werribee Gorge had the highest nativeness scores based on both richness (100%) and abundance (100%), while the middle Werribee River site (WER-30289-9) had the lowest (richness [40%], abundance [11%]).

In terms of priority species, River blackfish were found at the Lerderderg River site (1 fish) and Werribee Gorge (14 fish), while Ornate galaxias were only found at the Lerderderg River (17 fish).

While not target species, Common yabby (*Cherax destructor*) was caught at Lerderderg Gorge (LER-22832-7, 15 individuals) and Werribee Gorge (1 individual) and the southern Victorian spiny crayfish (*Euastacus yarraensis*) was only caught at Werribee Gorge (15 individuals).

Table 5 Catch data for Werribee catchment sites. Data are presented as number of individuals caught at each site, and aggregate metrics are presented for each species and site.

Species Name	Common Name	Site				Total
		LER-22832-7	WERRIBEE GORGE	WER-30289-9	WER-138085-6	
Native Fish						
Southern Shortfin Eel	*Anguilla australis*			3	16	**19**
River Blackfish	*Gadopsis marmoratus*	1	14			**15**
Ornate Galaxias	*Galaxias ornatus*	17				**17**
Common Galaxias	*Galaxias maculatus*				67	**67**
Flathead Gudgeon	*Philypnodon grandiceps*				7	**7**
Tupong	*Pseudaphritis urvilli*				2	**2**
Smelt	*Retropinna semoni*			1		**1**
Exotic Fish						
Eastern Gambusia	*Gambusia holbrooki*				8	**8**
Redfin Perch	*Perca fluviatilis*			14		**14**
Roach	*Rutilus Rutilus*			9		**9**

Species Name	Common Name	Site				Total
Tench	*Tinca tinca*			8		8
Native Crustaceans (Non-target species)						
Common Yabby	*Cherax destructor*	15	1			16
Southern Victorian Spiny Crayfish	*Euastacus yarraensis*		15			15
Native fish species richness (TOTAL)		2	1	2	4	7
Exotic fish species richness (TOTAL)		0	0	3	1	4
Native fish species abundance (TOTAL)		18	14	1	92	128
Exotic fish species abundance (TOTAL)		0	0	31	8	39
Nativeness – Richness (%)		100	100	40	80	64
Nativeness – Abundance (%)		100	100	11	76	77

3.2.2 Maribyrnong catchment

During the survey of the Maribyrnong catchment a total of 84 fish were caught over three sites representing eight species (six native and two exotic) (Table 6). The exotic Eastern gambusia was the most abundant species (46 fish), followed by the native Southern pygmy perch (*Nannoperca australis*; 16 fish), Southern shortfin eel (9 fish), Common galaxias (5 fish), Flathead gudgeon (3 fish) and Tupong (2 fish), the exotic Goldfish (2 fish), and the native Yarra pygmy perch (*Nannoperca obscura*; 1 fish).

Lower Deep Creek (DPW-63085-7) and Maribyrnong River (MRB-130320-2) sites had the highest nativeness scores based on both richness (100%) and abundance (100%), while Upper Deep Creek (DPW-13586-2) had the lowest (richness [60%], abundance [28%]).

Upper Deep Creek site also held the only two priority species captured, Southern pygmy perch (16 fish) and Yarra pygmy perch (1 fish). No crayfish were caught.

Table 6 Catch data for Maribyrnong catchment sites. Data are presented as number of individuals caught at each site, and aggregate metrics are presented for each species and site.

Species Name	Common Name	Site			Total
		DPW-13586-2	DPW-63085-7	MRB-130320-2	
Native Species					
Southern Shortfin Eel	*Anguilla australis*	2	3	4	9
Common Galaxias	*Galaxias maculatus*			5	5
Southern Pygmy Perch	*Nannoperca australis*	16			16
Yarra Pygmy Perch	*Nannoperca obscura*	1			1
Flathead Gudgeon	*Philypnodon grandiceps*			3	3
Tupong	*Pseudaphritis urvilli*			2	2
Exotic Species					
Goldfish	*Carassius auratus*	2			2
Eastern Gambusia	*Gambusia holbrooki*	46			46
Native fish species richness (TOTAL)		3	1	4	6
Exotic fish species richness (TOTAL)		2	0	0	2
Native fish species abundance (TOTAL)		19	3	14	36
Exotic fish species abundance (TOTAL)		48	0	0	48
Nativeness – Richness (%)		60	100	100	75
Nativeness – Abundance (%)		28	100	100	43

3.2.3 Yarra catchment

During the survey of the seven Yarra catchment sites 220 fish were caught representing 12 species (seven native and five exotic) (Table 7). The native Common galaxias were the most abundant species (38 fish), followed by Southern pygmy perch (48 fish), Ornate galaxias (75 fish), and River blackfish (18 fish), exotic Roach (17 fish) and Brown trout (*Salmo trutta*) (9 fish), native Flathead gudgeon (7 fish), exotic Yellowfin goby (*Acanthogobius flavimanus*; 3 fish) and Eastern gambusia (2 fish), native Smelt (2 fish) and Southern shortfin eel (1 fish), and exotic Redfin perch (1 fish).

The Lower Yarra River site (YAR-374049-3) had the highest nativeness scores based on both richness (100%) and abundance (100%), while Woori Yallock Creek (WOY-8964-3) had the lowest (richness [50%], abundance [64%]). Other sites ranged between 50-67% for richness and 64-95% for abundance.

Regarding priority species, River blackfish, Ornate galaxias, and Southern pygmy perch were caught in the catchment. River blackfish were found in the Upper Yarra River (YAR-42313-7; 11 fish) and Hoddles Creek (HDL-2685-5; 6 fish), and Woori Yallock Creek (WOY-8964-3; 1 fish). Ornate galaxias were found in New Chum Creek (NCC-3576-4; 27 fish), Hoddles Creek (5 fish), and Woori Yallock Creek (6 fish). Finally, Southern pygmy perch were found in the Plenty River (LE-16938-4; 37 fish) and Diamond Creek (ART-4232-0; 11 fish).

Southern Victorian Spiny Crayfish were caught in the Upper Yarra River (YAR-42313-7; 3 crayfish) and Woori Yallock Creek (4 crayfish).

Table 7 Catch data for Yarra catchment sites. Data are presented as number of individuals caught at each site, and aggregate metrics are presented for each species and site.

Species Name	Common Name	Site							Total
		PLE-16938-4	ART-4232-0	NCC-3576-4	YAR-42313-7	YAR-374049-3	HDL-2685-5	WOY-8964-3	
Native Species									
Southern Shortfin Eel	*Anguilla australis*			1					1
River Blackfish	*Gadopsis marmoratus*				11		6	1	18
Ornate Galaxias	*Galaxias ornatus*			27			5	6	38
Common Galaxias	*Galaxias maculatus*	1				74			75
Southern Pygmy Perch	*Nannoperca australis*	37	11						48
Flathead Gudgeon	*Philypnodon grandiceps*					7			7
Smelt	*Retropinna semoni*					2			2
Exotic Species									
Yellowfin Goby	*Acanthogobius flavimanus*					3			3

Species Name	Common Name	Site							Total
Eastern Gambusia	*Gambusia holbrooki*	2							2
Redfin Perch	*Perca fluviatilis*							1	1
Roach	*Rutilus Rutilus*		2	15					17
Brown Trout	*Salmo trutta*				5		1	3	9
Native Crustaceans (Non-target species)									
Southern Victorian Spiny Crayfish	*Euastacus yarraensis*				3			4	7
Native fish species richness (TOTAL)		2	1	2	1	3	2	2	7
Exotic fish species richness (TOTAL)		1	1	1	1	1	1	2	5
Native fish species abundance (TOTAL)		38	11	28	11	83	11	7	188
Exotic fish species abundance (TOTAL)		2	2	15	5	3	1	4	32
Nativeness – Richness (%)		67	50	67	50	75	67	50	58
Nativeness – Abundance (%)		95	85	65	69	97	92	64	85

3.2.4 Dandenong catchment

The survey of the two Dandenong Creek sites resulted in 40 fish being caught representing seven species (four native and three exotic) (Table 8). Southern shortfin eel (16 fish) was the most abundant species, followed by Flathead gudgeon (7 fish), the exotic Eastern gambusia (6 fish), Goldfish (5 fish), and Oriental weatherloach (*Misgurnus anguillicaudatus*; 4 fish), and the native Common galaxias (1 fish) and Tupong (1 fish).

Both sites had relatively low nativeness scores, with Lower Dandenong Creek (DNG-13753-1) scoring the highest on both richness (67%) and abundance (72%) compared to the Upper Dandenong Creek (DNG-13753-1) scores of 33% for richness and 47% for abundance. No priority fish species and no crayfish were caught.

Table 8 Catch data for Dandenong catchment sites. Data are presented as number of individuals caught at each site, and aggregate metrics are presented for each species and site.

Species Name	Common Name	Site		Total
		DNG-13753-1	DNG-31881-2	
Native Species				
Southern Shortfin Eel	*Anguilla australis*	7	9	**16**
Common Galaxias	*Galaxias maculatus*		1	**1**
Flathead Gudgeon	*Philypnodon grandiceps*		7	**7**
Tupong	*Pseudaphritis urvilli*		1	**1**
Exotic Species				
Goldfish	*Carassius auratus*	5		**5**
Eastern Gambusia	*Gambusia holbrooki*	3	3	**6**
Oriental Weatherloach	*Misgurnus anguillicaudatus*		4	**4**
Native fish species richness (TOTAL)		1	4	**4**
Exotic fish species richness (TOTAL)		2	2	**3**
Native fish species abundance (TOTAL)		7	18	**30**
Exotic fish species abundance (TOTAL)		8	7	**10**
Nativeness – Richness (%)		33	67	**57**
Nativeness – Abundance (%)		47	72	**75**

3.2.5 Western Port catchment region

The survey of the Western Port catchment region included eight sites spread across six individual catchments that drain into Western Port. A total of 211 fish were caught representing nine species (six native and three exotic) (Table 9). Native Southern shortfin eel (76 fish) were the most abundant, followed by Common galaxias (71 fish) and Southern pygmy perch (29 fish), Tupong (22 fish), Australian grayling (*Prototroctes maraena*; 8 fish), and River blackfish (2 fish). Very few exotic fish were caught with only single individuals of European carp, Brown trout and Eastern gambusia being detected.

Given the above results, it is unsurprising that nativeness scores were high across all sites. Balcombe Creek (BLC-3709-0), Cardinia Creek (CDC-7795-5 and CDC-10600-4), Lang Lang River (LNG-29460-1), and Bass River (BAS-22307-6) sites each recorded the highest possible nativeness scores for richness (100%) and abundance (100%). The Bass River site scored the lowest based on species richness (67%), while the lower Bunyip River site (BNY-70608-3) scores the lowest based on abundance (93%).

Regarding priority species, River blackfish, Southern pygmy perch, and Australian grayling were caught in the catchment. River blackfish were only caught at the Upper Bunyip River site (BNY-11161-3; 2 fish), while Southern pygmy perch were caught in the lower (1 fish) and upper (14 fish) Cardinia Creek sites, and the Upper Bunyip River site (14 fish). Australian grayling was only recorded at the one site on the Lang Lang River.

Unidentified Spiny crayfish (*Euastacus* sp.) were caught in Upper Cardinia Creek, both Bunyip River sites, and at the one the Tarago River site (TAR-22224-5).

Table 9 Catch data for Western Port catchment sites. Data are presented as number of individuals caught at each site, and aggregate metrics are presented for each species and site.

Species Name	Common Name	Site								Total
		BLC-3709-0	CDC-7795-5	CDC-10600-4	BNY-11161-3	BNY-70608-3	TAR-22224-5	LNG-29460-1	BAS-22307-6	
Native Species										
Southern Shortfin Eel	*Anguilla australis*		5	3	1	2	6	37	22	**76**
River Blackfish	*Gadopsis marmoratus*				2					**2**
Common Galaxias	*Galaxias maculatus*	17	5			8	7	30	4	**71**
Southern Pygmy Perch	*Nannoperca australis*		14	1	14					**29**
Australian Grayling	*Prototroctes maraena*							8		**8**
Tupong	*Pseudaphritis urvilli*				2	3	2	15		**22**
Exotic Species										
European Carp	*Cyprinus carpio*					1				**1**

Species Name	Common Name	Site								Total
Eastern Gambusia	*Gambusia holbrooki*						1			1
Brown Trout	*Salmo trutta*				1					1
Tench	*Tinca tinca*									
Native Crustaceans (Non-target species)										
Spiny Crayfish	*Euastacus* sp.		2		2	2	4			10
Native fish species richness (TOTAL)		1	3	2	4	3	3	4	2	6
Exotic fish species richness (TOTAL)		0	0	0	1	1	1	0	0	3
Native fish species abundance (TOTAL)		17	24	4	19	13	15	90	26	208
Exotic fish species abundance (TOTAL)		0	0	0	1	1	1	0	0	3
Nativeness – Richness (%)		100	100	100	80	75	75	100	100	67
Nativeness – Abundance (%)		100	100	100	95	93	94	100	100	99

3.3 Community-level condition

The catchment level fish community condition ratings are summarised in Table 10. Based on the three metrics of community condition presented here, the Werribee, Yarra and Western Port catchments scored equal highest with an average score of 3.7 (*Moderate*) each. Werribee and Yarra catchments each exhibited *High* native species richness scores, while Western Port received a *Moderate* score. Similarly, Werribee and Yarra catchments received *High* nativeness scores based on the abundance of native species relative to exotic species, while Western Port scored *Very High*. However, nativeness based scores based on species richness were moderate in these three catchments due to the similarly high richness of exotic species present.

The Dandenong catchment scored 3.3 (*Moderate*), receiving a *High* score for nativeness based on abundance, and *Moderate* scores for nativeness based on richness and native species richness.

The Maribyrnong scored the lowest with 3.0 (Moderate), receiving a *High* score for nativeness based on species richness, a *Moderate* score for species richness, and a *Low* score for nativeness based on abundance.

Table 10 Catchment level fish community status ratings

Metric	Maribyrnong	Werribee	Yarra	Dandenong	Western Port
Species richness	Moderate	High	High	Moderate	Moderate
Nativeness - species richness	High	Moderate	Moderate	Moderate	Moderate
Nativeness - abundance	Low	High	High	High	Very High

3.4 Priority species assessment

In this section we present a number of metrics that can be used to monitor the status of priority species over time. As this is the first survey as part of the HWS project, the results present a baseline against which future results can be prepared.

3.4.1 Ornate galaxias (*Galaxias ornatus*)

The metrics for Ornate galaxias are presented in Table 11. This species was captured at 25% (1) of the sites within the Werribee catchment and the catch per unity effort (CPUE) was 0.21. Only adults were caught, meaning there was no indication of successful breeding during the last breeding season (Spring-Summer). Of concern, close to half (47%) of the fish caught were infected by parasites. Ornate galaxiids were also caught at 43% (3) of the sites within the Yarra catchment. The average CPUE across sites was 0.63, which can be split into 0.48 for adults and 0.15 for young-of-year fish. The distribution of adult versus young-of-year catch is visually presented in Figure 2.

Table 11 Metrics for monitoring the status of Ornate galaxias (*Galaxias ornatus*). CPUE calculated as fish / 1 minute of electrofishing.

Metric	Werribee	Maribyrnong	Yarra	Dandenong	Western Port
Sites present (%, number)	25 (1)	0	43 (3)	0	0
Average Abundance (CPUE)	0.21	n/a	0.63	n/a	n/a
Juvenile recruitment (young-of-year CPUE)	0.00	n/a	0.15	n/a	n/a
Mature fish abundance (mature fish CPUE)	0.21	n/a	0.48	n/a	n/a
Disease/parasite/abnormality prevalence (%)	47 (Parasites)	n/a	0	n/a	n/a

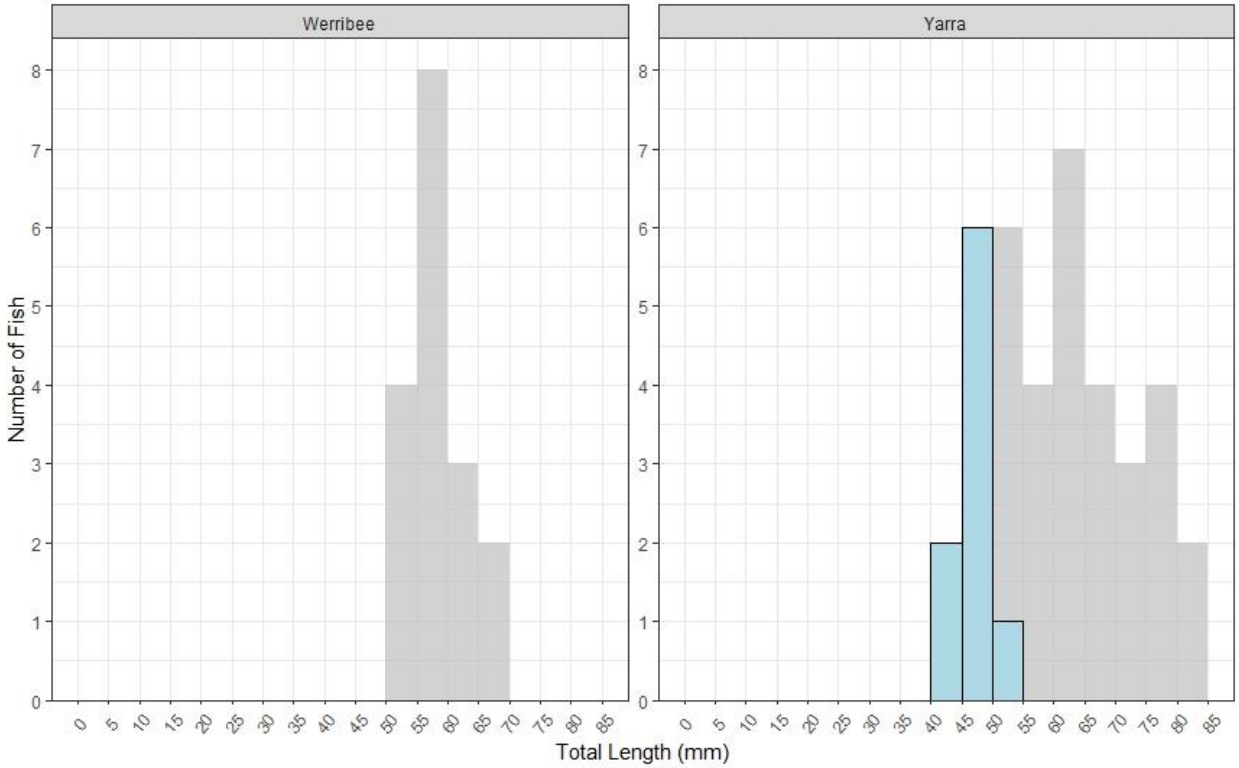

Figure 2 Size class frequency for Ornate galaxias (*Galaxias ornatus*) in each catchment it was detected. Young-of-year fish are highlighted in blue. Note that each column represents the number of fish that fall within a particular size class (e.g. 0-4mm, 5-9mm, 10-14mm). As such, both young-of-year and 1+ fish can occur in a single column where their cut-off length falls.

3.4.2 River blackfish (*Gadopsis marmoratus*)

The metrics for River blackfish are presented in Table 12. This species was captured at 50% (2) of the sites within the Werribee catchment and the average CPUE across sites was 0.19. The average CPUE was 0.10 for adults and 0.09 for young-of-year fish. The distribution of adult versus young-of-year catch is visually presented in Figure 3. Withing the Yarra catchment the species was caught at 43% (3) of sites and the average CPUE was 0.11. Adult CPUE was 0.09, while young-of-year CPUE was 0.02. Of the fish caught in the catchment, 20% exhibited fin damage. Within the Western Port catchment area, the species was caught at 12.5% (1) of sites with the CPUE being 0.01. The CPUE was 0.005 for both adults and young-of-year.

Table 12 Metrics for monitoring the status River blackfish (*Gadopsis marmoratus*). CPUE calculated as fish / 1 minute of electrofishing.

Metric	Werribee	Maribyrnong	Yarra	Dandenong	Western Port
Sites present (%, number)	50 (2)	0	43 (3)	0	12.5 (1)
Average Abundance (CPUE)	0.19	n/a	0.11	n/a	0.01
Juvenile recruitment (young-of-year CPUE)	0.09	n/a	0.02	n/a	0.005
Mature fish abundance (mature fish CPUE)	0.10	n/a	0.09	n/a	0.005
Disease/parasite/abnormality prevalence (%)	0	n/a	20 (Fin damage)	n/a	0

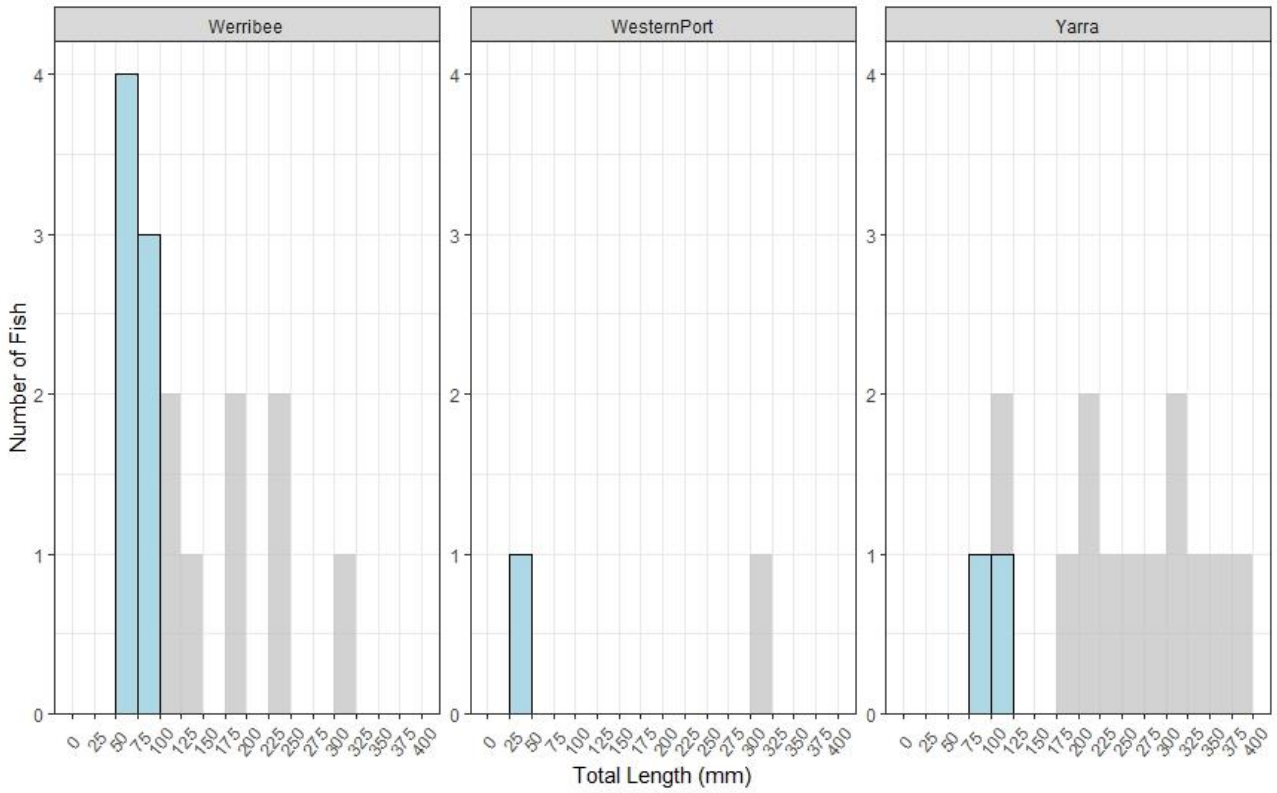

Figure 3 Size class frequency for River blackfish (*Gadopsis marmoratus*) in each catchment it was detected. Young of year fish are highlighted in blue. Note that each column represents the number of fish that fall within a particular size class (e.g. 0-24mm, 25-49mm, 50-74mm). As such, both young-of-year and 1+ fish can occur in a single column where their cut-off length falls.

3.4.3 Southern pygmy perch (*Nannoperca australis*)

The metrics for Southern pygmy perch are presented in Table 13. Within the Maribyrnong catchment, the species was captured at 33% (1) of the sites and the CPUE was 0.26. The CPUE was 0.01 for adults and 0.25 for young-of-year fish. The distribution of adult versus young-of-year catch is visually presented in Figure 4. Nearly a third (31%) of the fish caught had fin damage. Withing the Yarra catchment the species was caught at 29% (2) of sites. The average CPUE was 0.06 and this catch was entirely made up of young-of-year fish. In Western Port catchment region, the species was caught at 25% (2) of the sites. The average CPUE was 0.02 which was entirely made up of young-of-year fish.

Table 13 Metrics for monitoring the status Southern pygmy perch (*Nannoperca australis*). CPUE calculated as fish / 1 minute of electrofishing.

Metric	Werribee	Maribyrnong	Yarra	Dandenong	Western Port
Sites present (%, number)	0	33 (1)	29 (2)	0	25 (2)
Average Abundance (CPUE)	n/a	0.26	0.06	n/a	0.02
Juvenile recruitment (young-of-year CPUE)	n/a	0.25	0.06	n/a	0.02
Mature fish abundance (mature fish CPUE)	n/a	0.01	0.00	n/a	0.00
Disease/parasite/abnormality prevalence (%)	n/a	31 (Fin damage)	0	n/a	0

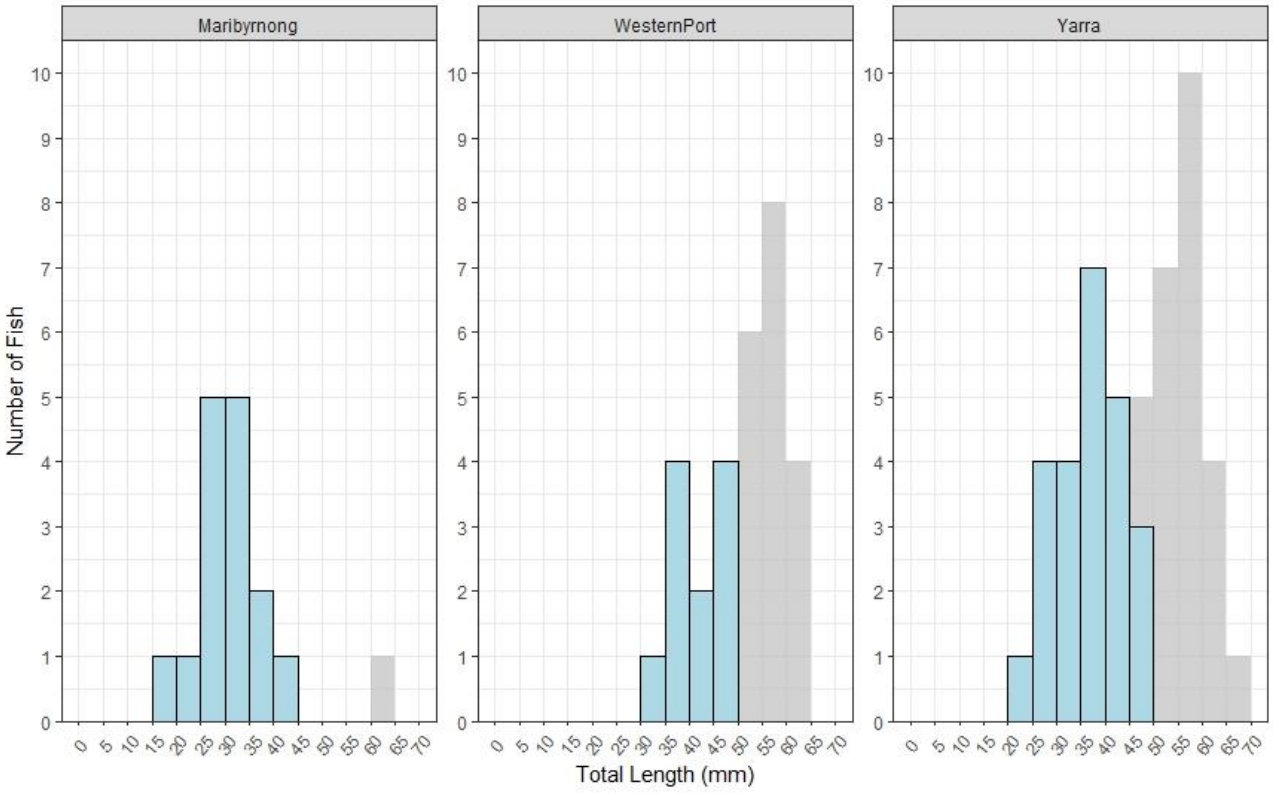

Figure 4 Size class frequency for Southern pygmy perch (*Nannoperca australis*) in each catchment it was detected. Young of year fish are highlighted in blue. Note that each column represents the number of fish that fall within a particular size class (e.g. 0-4mm, 5-9mm, 10-14mm). As such, both young-of-year and 1+ fish can occur in a single column where their cut-off length falls.

3.4.4 Yarra pygmy perch (*Nannoperca obscura*)

The metrics for Yarra pygmy perch are presented in Table 14. Within the Maribyrnong catchment, the only catchment where it was caught, the species was captured at 33% (1) of the sites. The CPUE was 0.02 with the one fish catch being an adult. The distribution of adult versus young-of-year catch is visually presented in Figure 5.

Table 14 Metrics for monitoring the status Yarra pygmy perch (*Nannoperca obscura*). CPUE calculated as fish / 1 minute of electrofishing.

Metric	Werribee	Maribyrnong	Yarra	Dandenong	Western Port
Sites present (%, number)	0	33 (1)	0	0	0
Average Abundance (CPUE)	n/a	0.02	n/a	n/a	n/a
Juvenile recruitment (young-of-year CPUE)	n/a	0.00	n/a	n/a	n/a
Mature (1+) fish abundance (mature fish CPUE)	n/a	0.02	n/a	n/a	n/a
Disease/parasite/abnormality prevalence (%)	n/a	0	n/a	n/a	n/a

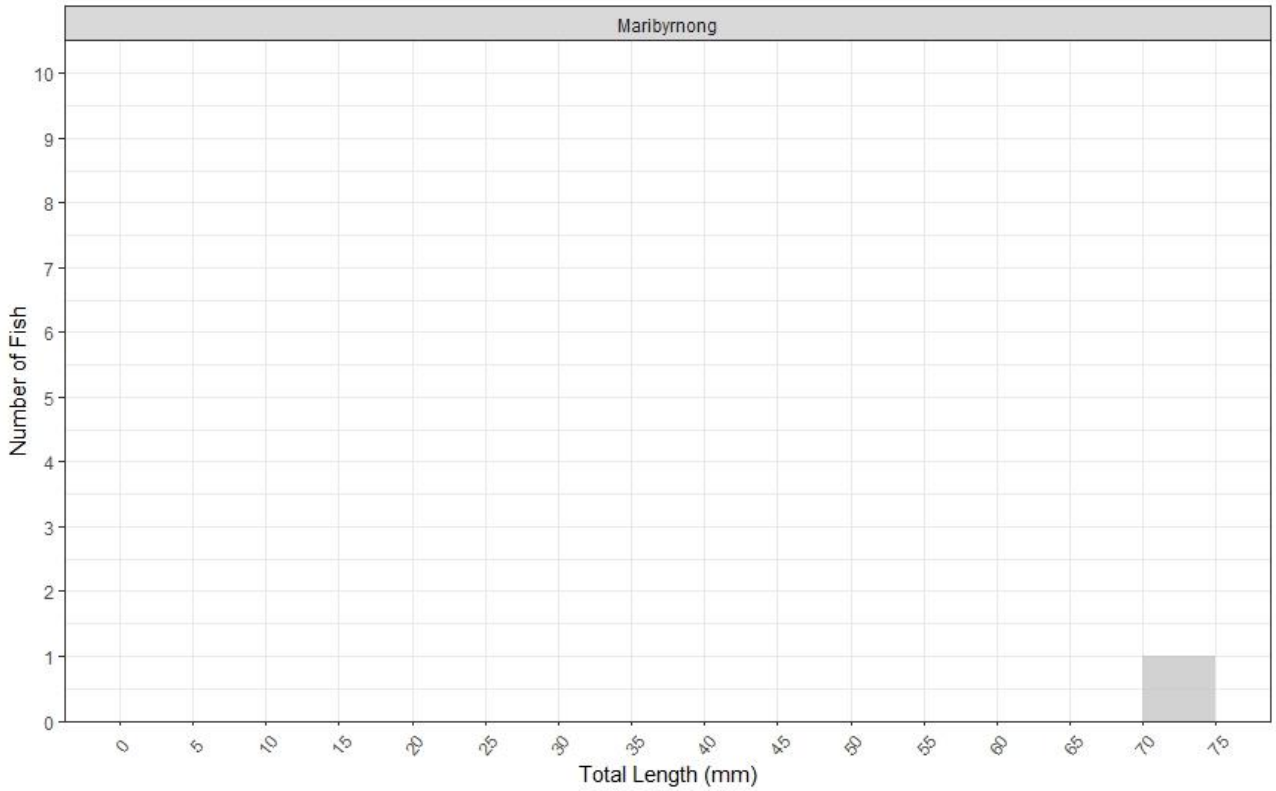

Figure 5 Size class frequency for Yarra pygmy perch (*Nannoperca obscura*) in each catchment it was detected. Young of year fish are highlighted in blue. Note that each column represents the number of fish that fall within a particular size class (e.g. 0-4mm, 5-9mm, 10-14mm). As such, both young-of-year and 1+ fish can occur in a single column where their cut-off length falls.

4. Discussion

The aim of the project was to undertake fish surveys across the main catchments within the Melbourne Water Management Region and to report the broad findings, which has been achieved. The results provide a suitable baseline to compare against future surveys and the data is recorded in such a way that it can be analysed in greater detail in line with the MERI.

Eight of the priority riverine species outlined in the MERI, were present at one or more of the study sites, which provides support for their choice as monitoring locations.

- Dwarf galaxias (*Galaxias pusilla*) was not captured in Balcombe Creek or Cardinia Creek, although they are known to be in the vicinity of the site. This result may be because fishing efficiency was greatly limited by thick emergent vegetation and deep-water habitat. These factors also lead to reduced electrofishing effort. Targeted dip netting (20 minutes) and passive trapping was conducted but was ultimately unsuccessful. Alternately, the species may simply be rare in the main stem of the creek as it shows a greater affinity for no and slow flowing wetland habitat (Coleman *et al.* 2018). These issues may be overcome by conducting more intensive dip netting and overnight trapping at the site, or by adding a sight at a nearby tributary or wetland where the species is better represented. As such, we recommend one or both of these options.

- Short-headed lamprey (*Mordacia mordax*) was not caught in the Western Port, Yarra, or Werribee catchment sites where it was thought likely to be (Melbourne Water 2018). This is a cryptic and patchily distributed species, and it is not unsurprising that it may be missed in a one-off survey. Future surveys will clarify the significance of this non-detection.

- Australian grayling was not found in the Maribyrnong River or Cardinia Creek where it may have been present. These migratory fish would be expected to be highly transitory between stream reaches, which may lead to a reduced detection probability. Alternately, there is a drop structure on Cardinia Creek in Clyde North (-38.090349, 145.382407), below the two Cardinia Creek sites, that appears to block upstream passage of some fish. While a fishway has been installed, surveys of the catchment suggest Australian Grayling may be impeded (Gilbert 2021). Furthermore, surveys within the last year have detected Grayling downstream, but not upstream of the structure (pers coms. Dion Iervasi).

- Australian mudfish (*Neochanna cleaveri*) was not detected on the Lower Yarra River below Dights Falls, although it has not been detected there for many years.

These results suggest that the Balcombe Creek (BLC-3709-0) and lower Cardinia Creek (CDC-10600-4) sites may not be optimally situated if the main reason for their location is monitoring of Dwarf galaxias and Australian grayling populations.

Our analysis of catchment condition, based on species richness and nativeness indices, indicated that each of the MW catchments are in moderate condition. Dandenong Creek was at the lower end of that category, while Werribee, Yarra and Western Port catchments were at the upper end.

Regarding the priority species examined, young-of-year and 1+ Ornate galaxias were observed in the Yarra catchment, suggesting successful recruitment is occurring and individuals are surviving to reproductive age. However, only 1+ fish were observed in the Werribee catchment at Lerderderg Gorge (LER-22832-7). A lack of young-of-year fish may indicate an unsuccessful spawning season in this reach. Furthermore, nearly half of the adults caught were infected with parasites, suggesting poor health, perhaps resulting from degraded habitat quality. As this is the first year of data collection and we only detected the species at one site, the result should be interpreted with caution. Future surveys will likely provide clarity.

At almost every site where River blackfish and Southern pygmy perch were recorded, both young-of-year and 1+ fish were present, again suggesting successful recruitment during the last breeding season and that individuals are surviving to reproductive age. Fin damage was prevalent (31% of fish) in Southern pygmy perch at Upper Deep Creek (DPW-13586-2) in the Maribyrnong catchment. A large number of exotic Eastern gambusia (46) were also caught at the site, which would likely explain this. Eastern gambusia are an aggressive species that may nip fins and prey on eggs and larvae (Macdonald *et al.* 2012; Woodward & Malone 2002). They have been shown to negatively impact on Southern pygmy perch populations, particularly where instream cover is limited (Macdonald *et al.* 2012). Future monitoring is needed to ascertain whether this negative interaction is impacting on the trajectory of the Southern pygmy perch and Yarra

pygmy perch populations at the site so that remediation efforts can be made if required (e.g. addition of physical structure). Finally, only a single adult Yarra pygmy perch was captured at Upper Deep Creek. The Deep Creek population is very range restricted but is of considerable size (Jones *et al.* 2008), and large numbers (51 individuals) of the species have been recently recorded in the upper Deep Creek catchment (pers coms. Rhys Coleman). It may be that sampling took place outside the area where the population is most concentrated, as population size may be variable at a small spatial scale. As such, it's recommended that time be spent determining if this site is most appropriate as a monitoring site for the species, or whether an alternative site with more individuals can be found. This may simply involve a review of other sampling program results in the catchment.

5. Recommendations

- Review survey data from Cardinia Creek to assess the impact of the drop structure and fishway near Thompson Road on upstream fish passage. Our current hypothesis, based on surveys since the construction of the fishway, is that upstream movement of Australian grayling is impeded.
- Add to or move current survey sites on Cardinia Creek to improve representation of Dwarf galaxias and Australian grayling. This may include adding or moving a site to a tributary or wetland that better represents Dwarf galaxias habitat, or moving or adding a site below the Thompson Road fishway where upstream movement of Australian grayling is known to be unimpeded. Having sites above and below the fishway will allow for upstream/downstream comparison and confirmation of its impact on fish movement, which could inform remediation actions.
- Investigate moving the Balcombe Creek site into the Briars Park, or another other suitable catchment in the Western Port catchment area where Dwarf galaxias are present. This would include a reconnaissance trip to potential sites prior to surveys next year.
- Review data after second year of sampling to see if additional survey effort may be required (e.g. fyke netting) to capture target species.
- Review other MW fish survey projects to integrate results and to help inform site locations such as on Upper Deep Creek.

6. References

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Appendix A. Field data sheets

DNG-31881-2

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION

Melbourne Water

MW.F.RS.1

Date sample began (dd mm yy)	Collector	Site code	Waterbody
24 / 5 / 22	Collector: J.S. Helper 1: D.T. Helper 2:	~~DPW-63086-2~~	DANDENONG CREEK LOWER (RESERVE)

Location description: LONACADERRA BRIDGE RD. SITE UP STREAM OF FISH WAY

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
	0.10	11	6.97	4357	18.3		8.03	72.8

Bottom depth (m) 0.5 Date & Time of Sampling 24/5/22 8:30:00

Platypus
Seen ○
Not seen ◉

Instructions and tips
IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet
*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record
*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: If fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet
*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record
* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Conditions

Waterbody		Weather	
Stream	◉	Sunny	◉
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	◉	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	◉
Estuary	○	**Flow**	
Wetland (Pa)	○		
Wetland (La)	○	No flow	○
Wetland (Es)	○	Flowing	◉

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates
Upstream
-38.029482
145.185230
Downstream
-38.02988
145.18458

Comments
IT IS A STREAM BUT THE FISH WAY AND RIFFLE MAKE IT ~~MAY~~ BE MORE LIKE A WETLAND/LAKE

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___ **EFFORT AND CATCH RECORD** Melbourne Water

dd mm yy	Collector: D.I	Site code: DPW-63085-?	**Gear codes**
24 / 5 / 22	Helper 1: James Shelley	Waterbody: DANDENONG Ck	Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
	Helper 2:		Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	8:2[illegible]	8:34	8:[illegible]	8:43	8:48	8:54	9:01	9:07	16:00	16:00
End	8:3[illegible]	8:3[illegible]	8:42	8:47	8:53	9:00	9:06	9:15	9:30	9:30
Date (dd/mm/yy) Start	24/5/22	24/5/22	→/→	→/→	→/→	→/→	→/→	→/→	24/5/22	24/5/22
End	24/5/22	→/→	→/→	→/→	→/→	→/→	→/→	→/→	25/5/22	25/5/22
Method	EF	EF	→	→	→	→	→	→	BT	FN
nets length (m) / *e'fish* start (sec)	0	→	→	→	→	→	→	→		
mesh (mm) / end (sec)	150	→	→	→	→	→	→	→		
Volts	200	ALL SAME								
pulses per sec	30									
% duty cycle (range)	20									
amps	0.9									
Species Code	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**
	0 (0)	0 (0)	( )	( )	( )	( )	( )	( )	( )	( )
PSE URV			0(1)							
ANG AUS			3(0)		1(0)	2(0)	2(0)			
GAL MAC				1(0)						
PHI GRA					1(0)	0(1)	4(0)	1(0)		
GAM HOL							1(0)	2(0)		
MIS ANG							1(0)	2(0)		

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MW.F.RS.2

Biological page # (e.g. 1/5) 1/2

BIOLOGICAL RECORD Melbourne Water

dd	mm	yy
24	5	22

Collector: DT
Helper 1: J. S.
Helper 2:

Site code: DPW-630857
Waterbody: DANDY CREEK

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	EF	3	ANG AUS	1	~350	TL					
2			ANG AUS	2	~370	TL					
3			ANG AUS	3	~220	TL					
4		4	CAL MAC	1	79	FL	5				
5		5	ANG AUS	4	115	TL	6				
6			PMI GRA	1	40	TL	6				
7		6	ANG AUS	5	~430	TL					
8			ANG AUS	6	~430	TL					
9		7	PMI GRA	2	32	TL					
10			PMI GRA	3	32	TL					
11			PMI GRA	4	32	TL					
12			PMI GRA	5	32	TL					
13			MIS ANG	1	125	TL	13				
14			ANG AUS	7	~300	TL					
15			ANG AUS	8	~350	TL					
16			GAM HOL	1	16	TL					
17		8	GAM HOL	2	17	TL					
18			GAM HOL	3	16	TL					
19			PMI GRA	4							
20			PMI GRA								
21			MIS ANG	2	97	TL	6				
22			MIS ANG	3	63	TL	5				
23	FLAG	1	MIS ANG	4	95	TL	5				
24		2	PMI GRA	6	27	TL	–				
25			ANG AUS	9	~700	TL	–				
			PMI GRA	7	32						

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FK 3+4 NO FIN

MW.F.RS.2

Biological page # (e.g. 1/5) 2 / 2

BIOLOGICAL RECORD Melbourne Water

dd	mm	yy
25	05	22

Collector: J.S
Helper 1: D.I
Helper 2:

Site code: DAN-63085-7
Waterbody: DANDENONG Ck.

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BT	1									
2	↓	2									
3		3									
4		4									
5		5									
6		6	CARP								
7		7									
8		8									
9		9	NO								
10		10									
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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MW.F.RS.4

Habitat page # (e.g. 1/3) 1 / 1

HABITAT RECORD Melbourne Water

dd mm yy: 24 / 5 / 22

Collector: J.S
Helper 1: D.I
Helper 2:

Site code: DPW-63085-7
Waterbody: DANDENONG CK.

Instructions
Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	6	7	8	9	10	Operation #
Substrate											***Substrate***
Bedrock	○	○	○	○	○	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	●	●	○	○	○	●	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	●	●	○	○	○	○	○	●	●	●	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	○	○	○	○	○	○	○	●	●	●	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	○	○	○	○	○	Unknown
Plants											***Plants***
Native trees	○	○	○	○	○	○	○	○	○	○	Native trees
Exotic trees	○	○	○	○	○	○	○	○	○	○	Exotic trees
Native shrubs	○	○	○	○	○	○	○	○	○	○	Native shrubs
Riparian grass	●	○	○	●	●	○	○	●	●	●	Riparian grass
Floating macrophytes	○	○	○	○	○	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	○	○	○	○	○	○	○	○	○	○	Emergent macrophytes
Submerged macrophytes	○	●	○	●	●	○	○	○	●	○	Submerged macrophytes
Filamentous algae	●	●	○	●	●	●	○	●	●	●	Filamentous algae
Suspended algae	○	○	○	○	○	○	○	○	○	○	Suspended algae
Biofilms	●	●	○	●	●	●	●	○	●	●	Biofilms
Cover											***Cover***
Rock	●	●	●	●	●	●	●	○	○	○	Rock
Timber	○	○	○	○	○	○	○	○	○	○	Timber
Undercuts	○	○	○	○	○	○	○	○	○	○	Undercuts
Leaf litter	○	○	○	○	○	○	○	○	○	○	Leaf litter
Macrophytes	○	○	○	○	○	○	○	○	○	○	Macrophytes
Mesohabitat											***Mesohabitat***
Pools	●	●	●	○	○	●	●	●	○	○	Pools
Run	○	○	○	○	○	○	○	○	○	○	Run
Riffle	●	●	●	●	●	●	●	○	○	○	Riffle
Rapid	○	○	○	●	○	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	○	○	●	●	●	Backwater
Velocity (F, M, S, NF)	M	M	M	M	M	S	NF	NF	NF	S	Velocity (F, M, S, NF)
Average wetted width (m)	25	25	22	22	25	25	40	40	30	30	Average width (m)
Average depth (m)	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	Average depth (m)
Distance travelled (m)	10	10	10	10	10	20	20	20	—	—	Distance travelled (m)

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MW.F.RS.5

Site map page # (e.g. 1/2) 1/1 **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code / Waterbody	**Instructions**
24 / 5 / 22	[illegible]	Site code: [illegible] Waterbody: [illegible]	Draw picture to help explain location, site details etc., if required or needed.

Comments: EFFORT WAS 4 x FK, 10 x BT.

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TUPONG, SHORT HEADED LAMPREY

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
24 / 5 / 22	D. I.	LNG-29460-1	LANG LANG RIVER
	Helper 1 J. B.	Location description: SOLDIERS RD (ADV WMBLE D/S MEADS RD)	
	Helper 2		

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.4	10.3	6.74	707	6.61		10.20	90.8

Bottom depth (m) ~~0.4~~ Date & Time of Sampling 24 / 5 / 22 12 : 40 : 00

Platypus
Seen ○
Not seen ⊗

*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Conditions

Waterbody		Weather	
Stream	⊗	Sunny	⊗
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	⊗
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	⊗
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-38.240306
145.610936
Downstream
-38.239918
145.610465

Comments

SITE IS VERY DEEP

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) 1/1

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 24 / 5 / 22.

Collector: J.S
Helper 1: D.T
Helper 2:

Site code: WC-29460-1
Waterbody: SOLDIERS RD.

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #		1	2	3	4	5	6	7	8	9	10
Time (24hr)	Start	13:55	14:03	14:12	14:20	14:29	15:01	15:15	15:27	13:00	:
	End	14:01	14:10	14:18	14:26	14:37	15:12	15:20	15:30	13:20	:
Date (dd/mm/yy)	Start	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
	End	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Method		BP									
nets length (m) / e'fish start (sec)		150									
mesh (mm) / end (sec)											
Volts		150									
pulses per sec		30									
% duty cycle (range)		20									
amps		1.9									

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
TUPONC	2 (1)	1	3	1	4	1	2			
GAL MAC	4 (2)	6	6	8		(1)	1		1	
AMS ANG	1 (1)	2 ~350 ~400	3 ~250 ~350	3 ~180 ~330	3 (6)	3 (2)	2 (4)	(8)		
GAM HOL		1								
CRAY LING		4	1	1	2		4			

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MW.F.RS.4

Habitat page # (e.g. 1/3) 1 / 1

HABITAT RECORD Melbourne Water

dd mm yy	Collector	Site code	Instructions
24 / 5 / 22	Collector S.S.	Site code LNG-29460-1	Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
	Helper 1 D.S.	Waterbody SOLDIERS RD	Definitions for some items are on first sheet.
	Helper 2		

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	●	●	●	●	●	Sand (0.6-2 mm)	●	○	●	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	●	●	●	●	○	Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	●	●	●	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	●	●	●	Native trees	●	●	●	○	○	Native trees
Exotic trees	●	●	●	○	○	Exotic trees	●	○	○	○	○	Exotic trees
Native shrubs	●	●	●	●	●	Native shrubs	●	○	○	○	○	Native shrubs
Riparian grass	○	●	●	●	●	Riparian grass	●	●	●	○	○	Riparian grass
Floating macrophytes	○	●	●	●	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	○	○	●	●	●	Emergent macrophytes	○	○	○	○	○	Emergent macrophytes
Submerged macrophytes	●	●	●	●	●	Submerged macrophytes	●	●	●	○	○	Submerged macrophytes
Filamentous algae	●	●	●	●	●	Filamentous algae	●	●	●	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	Biofilms	●	●	●	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	○	○	○	●	○	Rock	●	●	●	○	○	Rock
Timber	○	●	●	●	●	Timber	○	○	○	○	○	Timber
Undercuts	●	○	●	○	○	Undercuts	○	○	○	○	○	Undercuts
Leaf litter	○	●	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	●	●	●	●	●	Macrophytes	●	●	○	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	●	●	●	○	○	Pools	○	○	○	○	○	Pools
Run	●	●	●	●	●	Run	●	●	●	○	○	Run
Riffle	○	○	○	●	●	Riffle	●	●	●	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	S.	S	S	S.	M.	Velocity (F, M, S, NF)	M	M	M	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	5.0	4.0	4.0	4.0	4.0	Average wetted width (m)	5.0	5.0	5.0	___	___	Average width (m)
Average depth (m)	0.6	0.6	0.5	0.4	0.2	Average depth (m)	0.2	0.2	0.2	___	___	Average depth (m)
Distance travelled (m)	20	10	10	10	10	Distance travelled (m)	15	10	10	___	___	Distance travelled (m)

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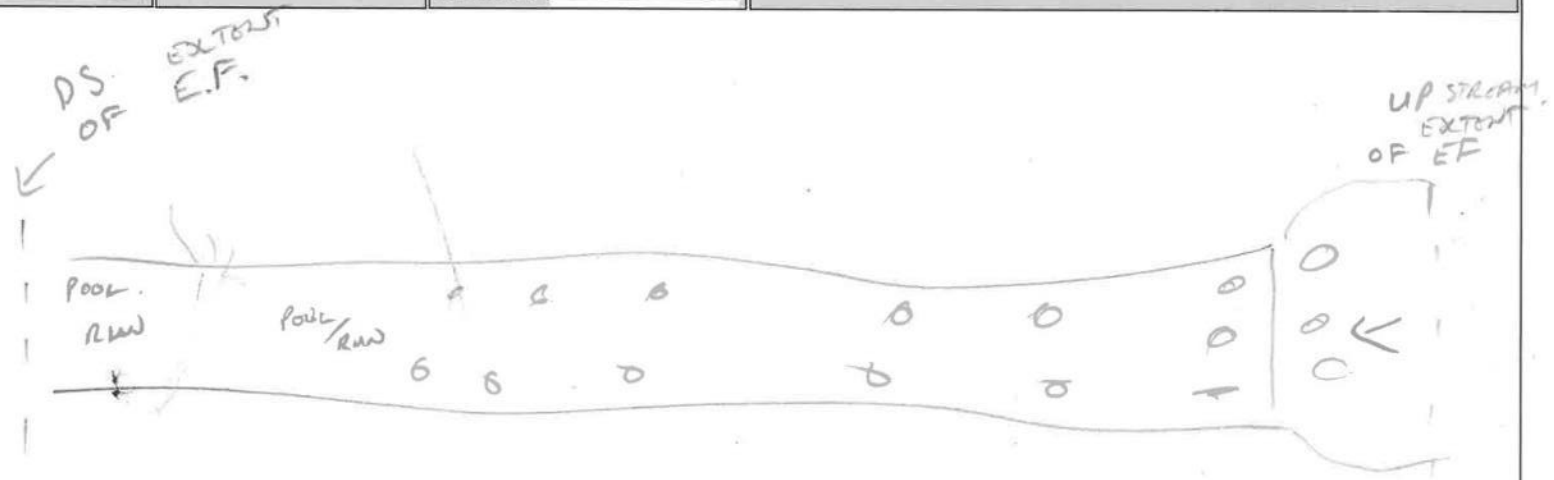
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
24 / 5 / 22	D.1	LWL-29460-1	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody SOLDIERS R	



Comments:

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MW.F.RS.2

Biological page # (e.g. 1/5) 3/3

BIOLOGICAL RECORD Melbourne Water

dd	mm	yy
24	6	22

Collector: JS
Helper 1: D.I
Helper 2:

Site code: LYC-29460-1
Waterbody: LANG LANG

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	6	TUPONC	13	189	FL	65				
2			AUS ANG	12	170	TL					
3			AUS ANG	13	97	TL	3				
4			" "	14	113	TL	6				
5		7	TUPONC	14	149	FL	29				
6			"	15	140	FL	26				
7			CAL MAC	25	71	FL					
8			AUS ANG	15	145	TL	8				
9			" "	16	135	TL	5				
10			PAR MAR	5	120	FL	19				
11			" "	6	114	FL	13				
12			" "	7	117	FL	12				
13			" "	8	107	FL	8				
14	BT	1	GAL MAC	26	85						
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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MW.F.RS.2

Biological page # (e.g. 1/5) 1 / 3

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 24 / 5 / 22

Collector: J.S
Helper 1: D.T
Helper 2:

Site code: LNG-29460-1
Waterbody: SOLDIERS RD

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP.	5	PRO MAR	1	163	FL	37.				
2			PRO MAR	2	120	FL	17.				
3			AUS ANG	1	155						
4			AUS ANG	2	96						
5			AUS ANG	3	83						
6			TUPONG	1	202	TL	77	W=TAIL DAMAGED			
7			TUPONG	2	215	TL	88				
8			TUPONG	3	~~173~~	TL	44				
9		↓	TUPONG	4	149	TL	35				
10		4	TUPONG	5	140	TL	23				
11			CAL MAC	1	53	FL	[illegible]				
12			" "	2	66	FL	[illegible]				
13			" "	3	58	FL					
14			" "	4	55	FL					
15			" "	5	65	FL					
16			" "	6	65	FL					
17			AUS ANG	4	~180	TL					
18			" "	[illegible]	~330	TL					
19			" "	6	220	TL					
20		↓	PRO MAR	3	116	FL	14				
21	[illegible]		CAL MAC	7	67	TL					
22		↓	CAL MAC	8	52	TL					
23		3	PRO MAR	4	115	FL	12				
24		↑	TUPONG	6	138	TL	22				
25		↓	"	7	150	TL	26				
			"	8	131	TL	19				

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MW.F.RS.2

Biological page # (e.g. 1/5) 2 / 3

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 24 / 5 / 22

Collector: J. S.
Helper 1: D. T
Helper 2:

Site code: LNX-29460-1
Waterbody: EAAG LANE

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. **Length codes:** TL-Total length, LCF-Length to Caudal Fork. **Reproductive Condition:** E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	3	GAL MAC	9	83	FL	3				
2			" "	10	83	FL	3				
3			" "	11	75	FL	0				
4			" "	12	113	FL	9				
5			" "	13	65						
6			" "	14	70						
7			AUS ANG	7	~250	TL					
8			" "	8	~350	TL					
9			" "	9	140	TL					
10			TAPPAN	9	128	FL	18				
11			"	10	150	FL	25				
12			"	11	140	FL	21				
13		2	"	12	84	FL	9				
14			GAL MAC	15	62	FL					
15			" "	16	75	FL					
16			" "	17	63	FL					
17			" "	18	66	FL					
18			" "	19	65	FL					
19			" "	20	68	FL					
20			AUS ANG	10	~350	TL					
21			" "	11	~410	TL					
22			CAM HOL	1	30	FL					
23		1	GAL MAC	21	60	FL					
24			" "	22	56	FL					
25			" "	23	54	FL					
			" "	24	63	FL					

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BAS-22307-6

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION

Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
5 / 5 / 22	J.L	BASS RIVER	Bass River
	Helper 1 T.R		
	Helper 2		

Location description: Upstream from Grantville-Glen Alvie Rd Bridge - Private Property.

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUURVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	12.3	6.90	611	1.88	–	2.65	25.0

Bottom depth (m) 0.7 Date & Time of Sampling 5 / 5 / 22 : 9 : 27

Platypus
Seen ○
Not seen ✓

Conditions

Waterbody		Weather	
Stream	✓	Sunny	✓
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	✓
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	✓
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-38. 436203
145. 565278

Downstream
-38. 436736
145. 563271

Comments

- large amounts of willows and organic matter in waterway

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 5 / 5 / 22

Collector: J.L.
Helper 1: TR.
Helper 2:

Site code: BAS-22307-6
Waterbody: BASS R.

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	9:30	9:40	9:50	10:00	10:10	10:20	10:30	10:40	9:10	::
Time (24hr) End	9:40	9:50	10:00	10:10	10:20	10:30	10:40	10:50	11:00	::
Date (dd/mm/yy) Start	5/5/22	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Date (dd/mm/yy) End	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Method	BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / e'fish start (sec)	0	150	300	450	600	750	900	1050	10 nets	
mesh (mm) / end (sec)	150	300	450	600	750	900	1050	1200		
Volts	110	110	110	110	110	110	110	110		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	12	12	12	12	12	12	12	12		
amps	2.8	2.8	2.8	2.9	2.8	2.8	2.9	2.8		
Species Code	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**
SFE	1 (2)	0 (3)	2 (1)	1 (4)	1 (1)	1 (0)	0 (3)	2 (0)	( )	( )
G. MAC.						3	1			

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BAS-22307-6

MW.F.RS.2

Biological page # (e.g. 1/5) 1 /1

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 5 / 5 / 22

Collector: S. L

Helper 1: T. R

Helper 2:

Site code: BASS RIVER

Waterbody: BASS RIVER

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-pansi net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	SFE	1	416	TL	162				
2	BP	3	SFE	2	342	TL	98				
3	BP	3	SFE	3	606	TL	514				
4	BP	4	SFE	4	525	TL	401				
5	BP	5	SFE	5	396	TL	128				
6	BP	6	SFE	6	322	TL	77				
7	BP	6	G.MAC	1	107	TL	11				
8	BP	6	G.MAC	2	91	TL	7				
9	BP	6	G.MAC	3	83	TL	6				
10	BP	7	G.MAC	4	74	TL	5				
11	BP	8	SFE	7	240	TL	23				
12	BP	8	SFE	8	447	TL	210				
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy: 5 / 5 / 22

Collector: J.L.
Helper 1: T.K.
Helper 2:

Site code Waterbody: BMS-223061-6 Bass R.

Instructions
Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	6	7	8	9	10	Operation #
Substrate											***Substrate***
Bedrock	○	○	○	○	○	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	○	○	○	●	●	●	●	●	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	●	●	●	●	●	●	●	●	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	●	●	●	●	●	●	●	●	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	○	○	○	○	○	Unknown
Plants											***Plants***
Native trees	○	○	○	○	○	○	○	○	○	○	Native trees
Exotic trees	●	●	●	●	●	●	●	●	○	○	Exotic trees
Native shrubs	○	○	○	○	○	○	○	○	○	○	Native shrubs
Riparian grass	●	●	●	●	●	●	●	●	○	○	Riparian grass
Floating macrophytes	●	●	●	●	●	●	●	●	○	○	Floating macrophytes
Emergent macrophytes	○	○	○	○	○	○	○	○	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	○	○	○	○	○	Submerged macrophytes
Filamentous algae	●	●	●	●	●	●	●	●	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	●	●	●	○	○	Biofilms
Cover											***Cover***
Rock	○	○	○	○	○	○	○	○	○	○	Rock
Timber	●	●	●	●	●	●	●	●	○	○	Timber
Undercuts	○	○	○	○	○	○	○	○	○	○	Undercuts
Leaf litter	●	●	●	●	●	●	●	●	○	○	Leaf litter
Macrophytes	○	○	○	○	○	○	○	○	○	○	Macrophytes
Mesohabitat											***Mesohabitat***
Pools	●	●	●	●	●	●	●	●	●	○	Pools
Run	●	●	●	●	●	●	●	●	●	○	Run
Riffle	○	○	○	○	○	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	S	S	S	S	S	S	S	S	—	—	Velocity (F, M, S, NF)
Average wetted width (m)	3	3	3	3	3	3	3	3	—	—	Average width (m)
Average depth (m)	0.9	0.9	0.8	0.5	0.8	0.6	0.9	0.9	—	—	Average depth (m)
Distance travelled (m)	20	20	20	20	20	20	20	20	—	—	Distance travelled (m)

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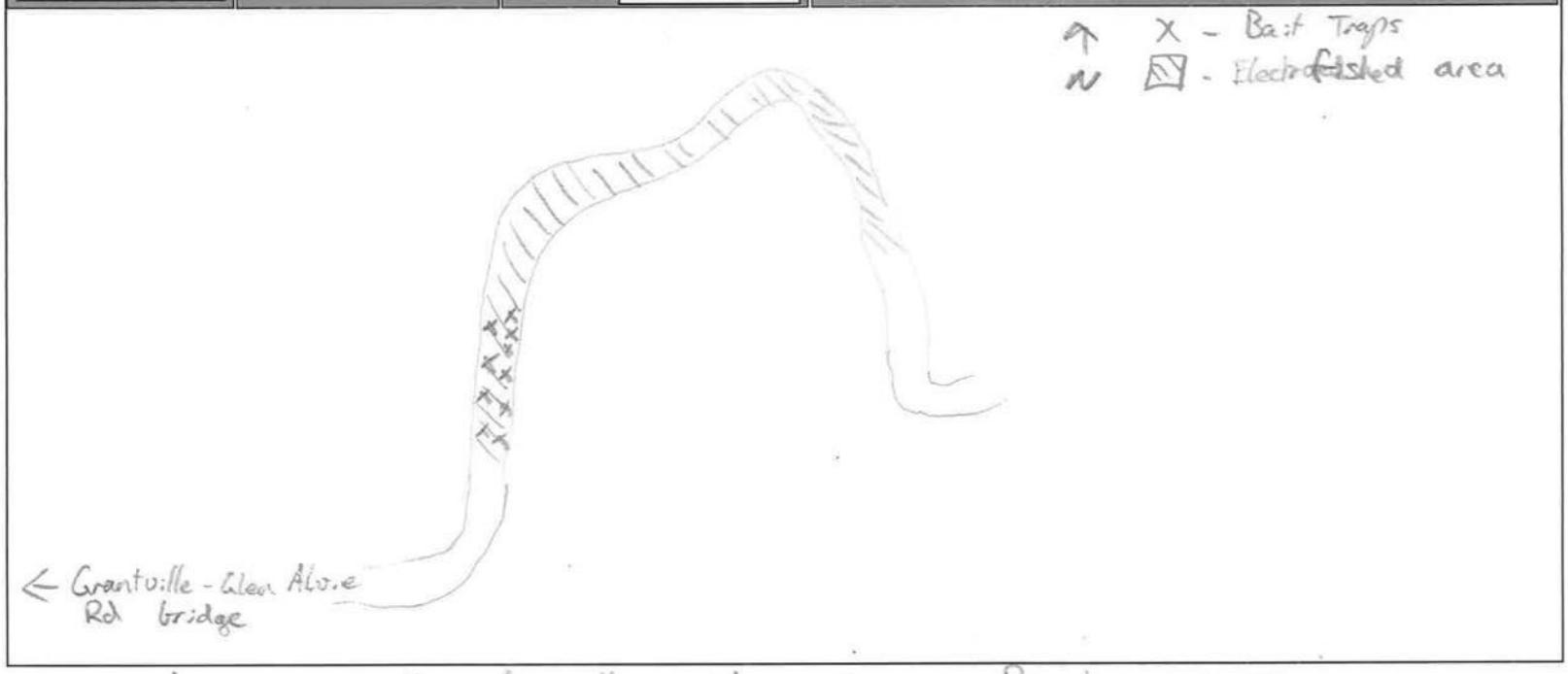
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
5 / 5 / 22	J.L.	BAS-22307-G	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody Bass R.	



Comments: Large amount of willows along river. Private access.

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NCC-3576-4

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water MW.F.RS.1

Date sample began (dd mm yy)	Collector	Helper 1	Helper 2	Site code	Waterbody
12 / 05 / 22	J.L	J.B		New Chum Crk	New Chum Creek

Location description: Downstream from Blackwoods Rd crossing and upstream

Instructions and tips
IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet
*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record
*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	11.5	7.28	166.1	13.6	-	7.79	71.5

Bottom depth (m) ______ Date & Time of Sampling 12 / 5 / 22 __:10:00

Platypus
Seen ○
Not seen ⊗

*Separate 'Condition' codes with a "/" and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet
*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record
* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Conditions

Waterbody		Weather	
Stream	⊗	Sunny	○
Channel	○	Cloudy	⊗
Floodplain	○	Rainy	⊗
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	⊗
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	⊗
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates
Upstream
-37.61907
145.49795
Downstream
-37.61963
145.49805

Comments

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy	Collector	Site code	Gear codes
12/5/22	Helper 1 J.L.	NCC-3576-4	Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
	Helper 2 J.B.	Waterbody New Chum Ck	Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #		1	2	3	4	5	6	7	8	9	10
Time (24hr)	Start	__:__:__	__:__:__	__:__:__	__:__:__	__:__:__	__:__:__	__:__:__	__:__:__	__:__:__	__:__:__
	End	__:__:__	__:__:__	__:__:__	__:__:__	__:__:__	__:__:__	__:__:__	__:__:__	__:__:__	__:__:__
Date (dd/mm/yy)	Start	12/5/22	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__
	End	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__
Method		BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / *e'fish* start (sec)		0	150	300	450	600	750	900	1050		
mesh (mm) / end (sec)		150	300	450	600	750	900	1050	1200		
Volts		200	200	200	200	200	200	200	200		
pulses per sec		30	30	30	30	30	30	30	30		
% duty cycle (range)		12	12	12	12	12	12	12	12		
amps		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
Rainbowfish	1 (___)	___ (___)	___ (___)	1 (___)	___ (___)	12 (___)	___ (___)	___ (___)	1 (___)	___ (___)
Golden Perch	3	4	5	2	6	8				
Spangled Perch								1		

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NCC-3576-4

MW.F.RS.2

Biological page # (e.g. 1/5) 1/2

BIOLOGICAL RECORD Melbourne Water

dd	mm	yy
12	05	22

Collector: J L
Helper 1: J B
Helper 2:

Site code: Chum Ck
Waterbody: Chum Ck

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BT	9	Rainb	1	146	LCF	54				
2	BP	1	G.Brev	1	84	TL	6				G.brev = G.ornatus (James Shelley)
3	BP	1	G.Brev	2	52		4				
4	BP	1	G.Brev	3	81		4				
5	BP	2	G.Brev	4	58		2				
6	BP	2	G.Brev	5	64		3				
7	BP	2	G.Brev	6	64		3				
8	BP	2	G.Brev	7	73		5				
9	BP	3	G.Brev	8	51		2				
10	BP	3	G.Brev	9	64		3				
11	BP	3	G.Brev	10	64		3				
12	BP	3	G.Brev	11	70		4				
13	BP	3	G.Brev	12	53		2				
14	BP	4	Roach	2	164	LCF	65				
15	BP	4	G.Brev	13	76	TL	4				
16	BP	4	G.Brev	14	75		5				
17	BP	4	G.Brev	15	46		2				
18	BP	5	G.Brev	5	76		5				
19	BP	5	G.Brev	16	65		3				
20	BP	5	G.Brev	17	67		3				
21	BP	5	G.Brev	18	65		2				
22	BP	6	Roach	3	213	LCF	223				
23	BP	6	Roach	4	125		119				
24	BP	6	Roach	5	206		126				
25	BP	6	Roach	6	153		53				

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MW.F.RS.2

NCC-3576-4

Biological page # (e.g. 1/5) 2/2 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 12/3/22

Collector: JL
Helper 1: JD
Helper 2:

Site code: Chum Ck
Waterbody: Chum Ck

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. **Length codes:** TL-Total length, LCF-Length to Caudal Fork. **Reproductive Condition:** E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	6	Roach	7	190	LCF	85				
2	BP	6	Roach	8	101		10				
3	BP	6	Roach	9	201		135				
4	BP	6	Roach	10	165		71				
5	BP	6	Roach	11	96		14				
6	BP	6	Roach	12	145		45				
7	BP	6	Roach	13	97		9				
8	BP	6	Roach	14	101		13				
9	BP	6	Roach	15	98		14				
10	BP	6	Gudgeon	19	76	TL	5				
11	BP	6	Mullet	20	89		9				
12	BP	6	Gudgeon	21	62		2				
13	BP	6	Gudgeon	22	65		3				
14	BP	6	Gudgeon	23	53		2				
15	BP	6	Gudgeon	24	69		3				
16	BP	6	Gudgeon	25	58		2				
17	BP	6	Gudgeon	26	57		1				
18	BP	8	SFE	1	364		72				
19	BP										
20	BP										
21	BP										
22											
23											
24											
25											

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MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy	Collector	Site code	Instructions
12 / 5 / 22	Helper 1 J.B	Waterbody New Chum Ck.	Mark circles with cross or fill in. Leave boxes blank if the item was not seen. Definitions for some items are on first sheet.
	Helper 2		

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	○	○	○	○	○	Native trees	○	○	○	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	○	○	○	○	○	Native shrubs	○	○	○	○	○	Native shrubs
Riparian grass	○	○	○	○	○	Riparian grass	○	○	○	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	○	○	○	○	○	Emergent macrophytes	○	○	○	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	○	○	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	○	○	○	○	○	Biofilms	○	○	○	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	○	○	○	○	○	Rock	○	○	○	○	○	Rock
Timber	○	○	○	○	○	Timber	○	○	○	○	○	Timber
Undercuts	○	○	○	○	○	Undercuts	○	○	○	○	○	Undercuts
Leaf litter	○	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	○	○	○	○	○	Macrophytes	○	○	○	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	○	○	○	○	○	Pools	○	○	○	○	○	Pools
Run	○	○	○	○	○	Run	○	○	○	○	○	Run
Riffle	○	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	M/S	S	M	M	S	Velocity (F, M, S, NF)	M/S	M	M	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	2	2	2	2	1	Average wetted width (m)	2	2	2	___	___	Average width (m)
Average depth (m)	0.5	0.5	0.2	0.2	0.5	Average depth (m)	0.2	0.5	0.5	___	___	Average depth (m)
Distance travelled (m)	15	15	15	15	15	Distance travelled (m)	15	15	15	___	___	Distance travelled (m)

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MW.F.RS.5

Site map page # (e.g. 1/2) ____/____ **SITE MAP** Melbourne Water

dd / mm / yy	Drawer	Site code / Waterbody	Instructions
12 / 5 / 22	J.L.	Site code: NCC-3576-4 Waterbody: New Chum Ck.	Draw picture to help explain location, site details etc., if required or needed.

Comments:

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BNY-70608-3

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
04 / 05 / 22	S. L	Bunyip-Lower	Bunyip River
	Helper 1 T. R		
	Helper 2		

Location description: Near Nar Nar Goon - Longwarry Rd bridge

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	12.8	7.20	178.4	14.1	–	7.65	72.0

Bottom depth (m) _____ Date & Time of Sampling 4 / 5 / 22 1430

Platypus
Seen ○
Not seen ⊗

*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Conditions

Waterbody		Weather	
Stream	✓	Sunny	○
Channel	○	Cloudy	✓
Floodplain	○	Rainy	✓
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	✓
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	✓
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-38.100916
145.7593926
Downstream
-38.1020429
145.7381775

Comments

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 4/5/22

Collector: J.L
Helper 1: T.R
Helper 2:

Site code: BNY-70608-3
Waterbody: BUNYIP R.

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	14:25	14:35	14:45	14:55	15:05	15:15	15:25	15:35	14:10	:
Time (24hr) End	14:35	14:45	14:55	15:05	15:15	15:25	15:35	15:45	15:55	:
Date (dd/mm/yy) Start	4/5/22	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Date (dd/mm/yy) End	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Method	BP	BP	BP	BP	BP	BP	BP	BP	B1	
nets / e'fish length (m) / start (sec)	0	150	300	450	600	750	900	1050	10 NETS	
mesh (mm) / end (sec)	150	300	450	600	750	900	1050	1200		
Volts	210	210	210	210	210	210	210	210		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	12	12	12	12	12	12	12	12		
amps	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
G.MAC	2 (0)	3 (1)		1 (0)		2 (0)				
TUPONG			1 (0)		1 (1)			1		
SFE						2 (0)				
CARP							1 (1)			
S.CRAY	1				1 (1)					

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BNY-70608-3

MW.F.RS.2

Biological page # (e.g. 1/5) 1/1

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 04/05/22

Collector: J.L

Helper 1: T.R

Helper 2:

Site code: BUNYIP-LOW

Waterbody: BUNYIP RIVER

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. **Length codes**: TL-Total length, LCF-Length to Caudal Fork. **Reproductive Condition**: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	G.MAC	1	127	TL	16				
2		1	G.MAC	2	131	TL	18				
3		1	S.CRAY	1	61	TL	5		F		
4		2	G.MAC	3	95	TL	10				
5		2	G.MAC	4	108	TL	10				
6		2	G.MAC	5	107	TL	10				
7		3	TUPONG	1	152	TL	35				
8		4	G.MAC	6	69	TL	2				
9		5	TUPONG	2	67	TL	2				
10		5	S.CRAY	2	58	TL	5		M		
11		6	G.MAC	7	64	TL	2				
12		6	G.MAC	8	57	TL	2				
13		6	SFE	1	263	TL	43				
14		6	SFE	2	730	TL	953				
15		7	CARP	1	511	LCF	3289				
16		8	TUPONG	3	141	TL	53				
17											
18											
19											
20											
21											
22											
23											
24											
25											

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MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy: 4/5/22

Collector: J.L.
Helper 1: T.K.
Helper 2:

Site code: BNV-706083
Waterbody: Bunyip R.

Instructions
Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	6	7	8	9	10	Operation #
Substrate											***Substrate***
Bedrock	○	○	○	○	○	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	●	●	●	●	●	●	●	●	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	●	●	●	●	●	●	●	●	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	○	○	○	○	○	○	○	○	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	○	○	○	○	○	Unknown
Plants											***Plants***
Native trees	●	●	●	●	○	○	○	●	○	○	Native trees
Exotic trees	●	●	●	●	●	○	●	○	○	○	Exotic trees
Native shrubs	○	○	○	○	○	○	○	○	○	○	Native shrubs
Riparian grass	○	○	○	○	○	○	○	○	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	●	●	○	○	●	●	●	○	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	○	○	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	○	○	○	○	○	Suspended algae
Biofilms	○	○	○	○	○	○	○	○	○	○	Biofilms
Cover											***Cover***
Rock	○	○	○	○	○	○	○	○	○	○	Rock
Timber	○	○	●	●	○	●	○	●	○	○	Timber
Undercuts	●	●	●	●	●	●	●	●	○	○	Undercuts
Leaf litter	○	○	○	○	○	○	○	○	○	○	Leaf litter
Macrophytes	●	●	○	○	●	●	●	●	○	○	Macrophytes
Mesohabitat											***Mesohabitat***
Pools	●	●	○	○	○	○	○	○	○	○	Pools
Run	●	●	●	●	●	●	●	●	○	○	Run
Riffle	○	○	○	○	○	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	M1	M1	M1	F	M1	F	F				Velocity (F, M, S, NF)
Average wetted width (m)	4	5	4	3	3	4	3				Average width (m)
Average depth (m)	0.5	0.6	0.6	0.5	0.5	0.5	0.5				Average depth (m)
Distance travelled (m)	20	20	20	20	20	20	20				Distance travelled (m)

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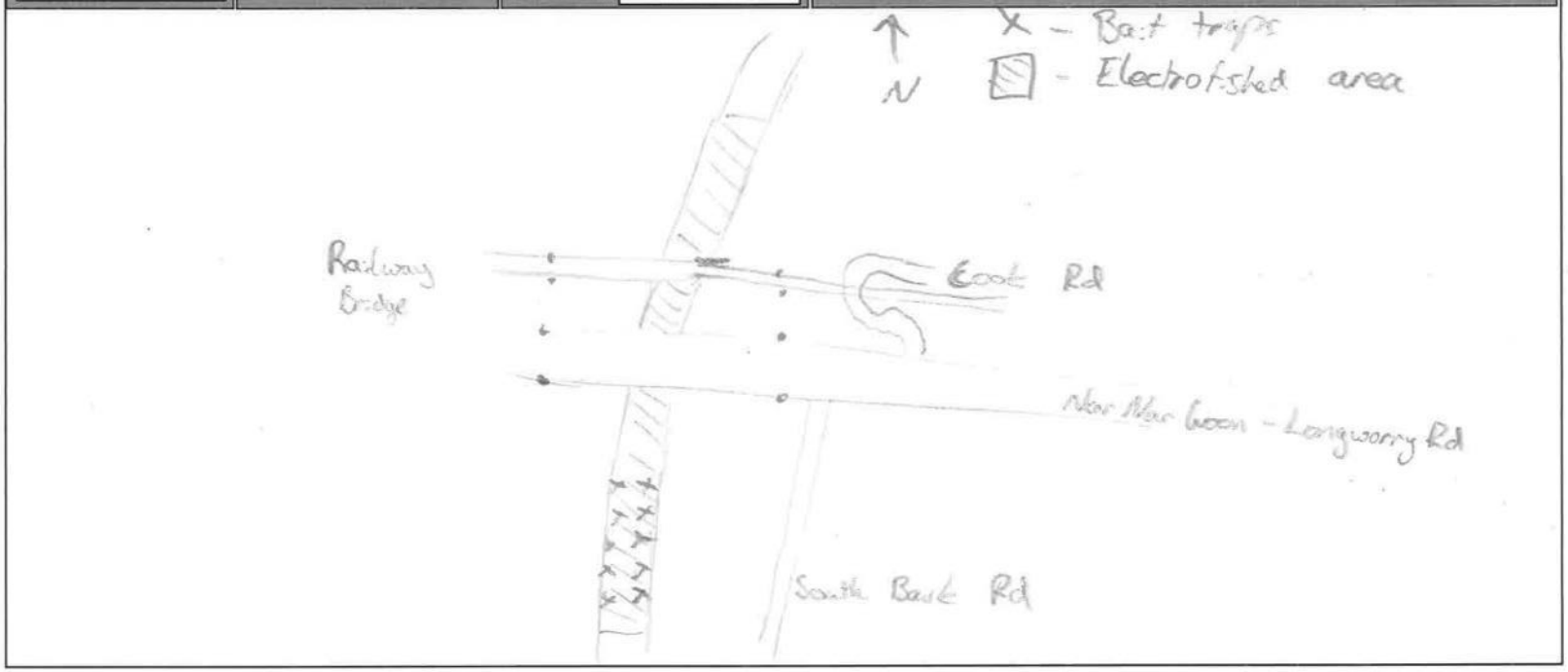
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
4 / 5 / 22		BNY-70608-3	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody BUNYIP R.	



Comments:

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BNY-11161-3

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
2 / 5 / 22	J. L	BUNYIP UPPER	BUNYIP RIVER
	Helper 1 T. R		
	Helper 2		

Location description: IN BUNYIP STATE FOREST, UPSTREAM FROM START OF FREEMAN'S MILLS TRACK OFF OF AQUEDUCT TRACK

Instructions and tips
IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet
*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record
*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.20	12.6	8.98	83.8	18.0	~	6.49	60.9

Bottom depth (m) _____ Date & Time of Sampling 2 / 5 / 22 07 : 51 : ___

Platypus
Seen ○
Not seen ⊗

*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet
*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record
* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Conditions

Waterbody		Weather	
Stream	✓	Sunny	✓
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	✓
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	✓
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates
Upstream
-37.969021
145.735959
Downstream
-37.970405
145.736293

Comments

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 2/5/22

Collector: J.L
Helper 1: T.R.
Helper 2:

Site code: BNM-11161-3
Waterbody: BUNYIP R.

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	8.00	8:10	8:20	8:30	8:40	8:50	9:00	9:13	09:45	::
Time (24hr) End	9.10	8:20	8:30	8:40	8:50	9:00	9:13	9:26	09:36	::
Date (dd/mm/yy) Start	2/5/22	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Date (dd/mm/yy) End	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Method	BP	BP	BP	BP	BP	BP	BP	BP	EST	
nets length (m) / e'fish start (sec)	0	150	300	450	600	750	900	1050	10 NETS	
mesh (mm) / end (sec)	150	300	450	600	750	900	1050	1200		
Volts	350	350	350	350	350	350	350	350		
pulses per sec	30 Hz	30	30	30	30	30	30	30		
% duty cycle (range)	12.6	12	12	12	12	12	12	12		
amps	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2		

Species Code	#cght (#obs) (___)	#cght (#obs) (___)	#cght (#obs) (___)	#cght (#obs) (___)	#cght (#obs) (___)	#cght (#obs) (___)	#cght (#obs) (___)	#cght (#obs) (___)	#cght (#obs) (___)	#cght (#obs) (___)
SPP	5(2)	2	2			1		2	2	
T.JPONG		1					1(1)			
SFE		1	(1)		1(2)					
R. BLACKFISH			1			1				
CRAY				(1)	(1)	1		1		
B. TROUT							1			

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MW.F.RS.2

BNY-11161-3

Biological page # (e.g. 1/5) 1/1 **BIOLOGICAL RECORD** Melbourne Water

dd	mm	yy
2	5	22

Collector: S.L
Helper 1: T.R
Helper 2:

Site code: BUNYIP - UPPER
Waterbody: BUNYIP RIVER

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. **Length codes**: TL-Total length, LCF-Length to Caudal Fork. **Reproductive Condition**: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	SPP	1	56	TL		-	M	-	
2		1	"	2	61	TL		-	M	-	
3		1	"	3	43	TL		-	-	-	
4		1	"	4	50	TL		-	-	-	
5		1	"	5	47	TL		-	-	-	
6		2	SPP	6	53	TL		-	M	-	
7		2	SPP	7	54	TL		-	-	-	
8		2	TUPONG	1	265	TL	184	-	-	-	
9		2	SFE	1	356	TL	158	-	-	-	
10		3	SPP	8	58	TL		-	M	-	
11		3	SPP	9	~~53~~	TL		-	M	-	
12		3	R.BLACK	1	46	TL		-	-	-	
13		6	SPP	10	44	TL		-	-	-	
14		6	R.BLACK	2	306	TL	345	-	-	-	
15		6	SPINY RAY	1	48	TL		-	F	-	
16		7	TUPONG	2	221	TL	106	-	-	-	
17		7	B.TROUT	1	287	TL	248	-	-	-	
18		8	SPP	11	45	TL		-	-	-	
19		8	SPINY RAY	2	26	TL		-	F	-	
20		8	SPP	12	37	TL		-	-	-	
21	BT	5	SPP	13	45	TL		-	-	-	
22	BT	6	SPP	14	38	TL		-	-	-	
23											
24											
25											

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MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy	Collector	Site code	Instructions
2 / 5 / 22	Helper 1: J.L.	BNY-11161-3	Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
	Helper 2: T.R.	Waterbody: BUNYIP R.	Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	◐	○	○	○	○	Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	◐	○	○	○	○	Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	◐	◐	○	◐	◐	Gravel (2-60 mm)	◐	◐	◐	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	◐	◐	◐	◐	◐	Sand (0.6-2 mm)	◐	◐	◐	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	◐	◐	◐	◐	◐	Native trees	◐	◐	◐	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	◐	◐	◐	◐	◐	Native shrubs	◐	◐	◐	○	○	Native shrubs
Riparian grass	◐	◐	◐	◐	◐	Riparian grass	◐	◐	◐	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	◐	◐	◐	◐	◐	Emergent macrophytes	◐	◐	◐	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	○	○	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	◐	◐	◐	◐	◐	Biofilms	◐	◐	◐	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	◐	◐	◐	◐	◐	Rock	◐	◐	◐	○	○	Rock
Timber	◐	◐	◐	◐	◐	Timber	◐	◐	◐	○	○	Timber
Undercuts	◐	◐	◐	◐	◐	Undercuts	◐	◐	◐	○	○	Undercuts
Leaf litter	◐	◐	◐	◐	◐	Leaf litter	◐	◐	◐	○	○	Leaf litter
Macrophytes	○	○	○	○	○	Macrophytes	○	○	○	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	○	○	○	○	○	Pools	○	○	○	○	○	Pools
Run	◐	◐	◐	◐	◐	Run	◐	◐	◐	○	○	Run
Riffle	○	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	F	F	F	F	F	Velocity (F, M, S, NF)	F	F	F	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	3	4	4	4	4	Average wetted width (m)	4	4	4	___	___	Average width (m)
Average depth (m)	0.6	0.6	0.6	0.6	0.4	Average depth (m)	0.4	0.4	0.4	___	___	Average depth (m)
Distance travelled (m)	20m	30m	20m	15m	10m	Distance travelled (m)	30m	20m	20m	___	___	Distance travelled (m)

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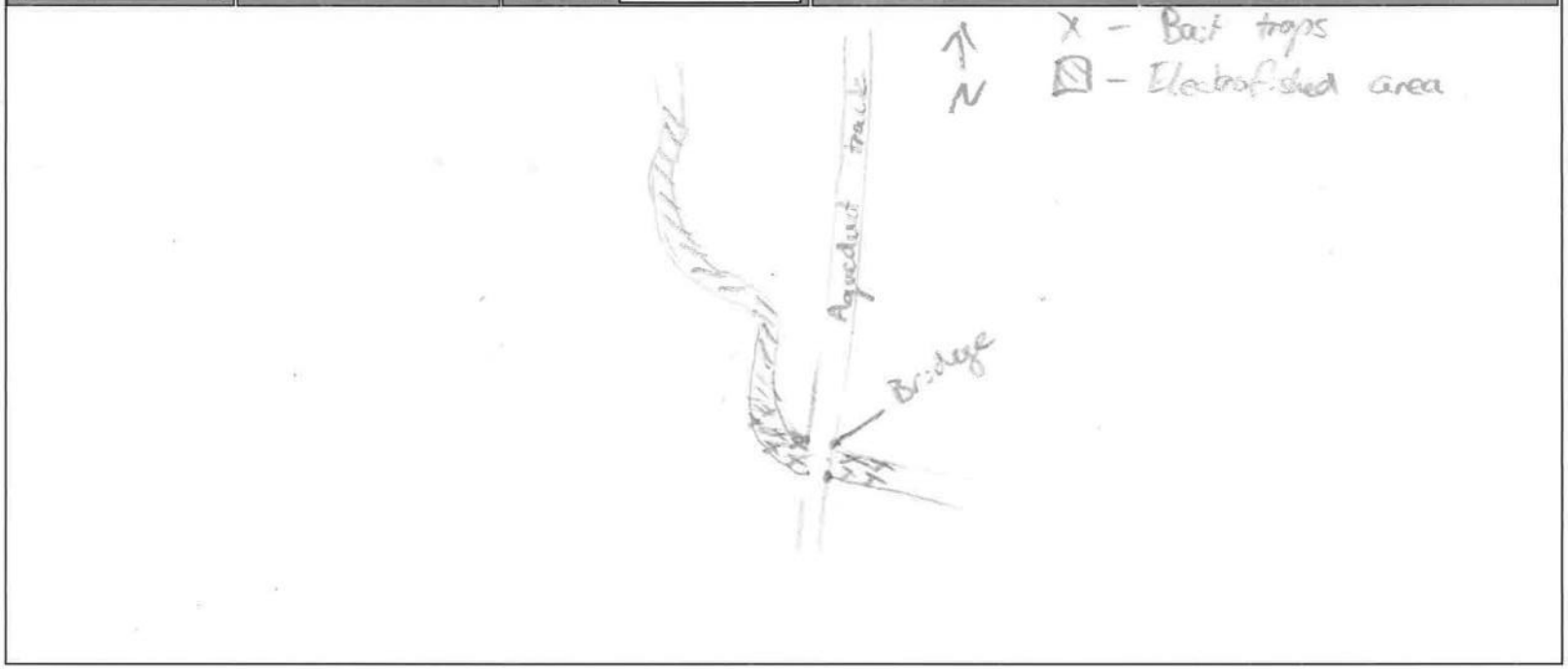
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
2 / 5 / 22	J.L	BNY-11161-3	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody BUNYIP R.	



Comments:

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WER-30289-9

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION

Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
11 / 05 / 22	S.L	Werribee Weir	Wen. Lee River
	Helper 1 M.L	Location description: Downstream of Bacchus Marsh WWTP	
	Helper 2		

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	2.2	13.2	7.56	503	12.6	–	9.51	92.1

Bottom depth (m) _____ Date & Time of Sampling 11 / 5 / 22 : 16 : 05

Platypus
Seen ○
Not seen ⊗

*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Conditions

Waterbody		Weather	
Stream	✓	Sunny	○
Channel	○	Cloudy	✓
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○		
Farm dam	○	Tidal	
Billabong	○	Yes	○
Estuary	○	No	✓
Wetland (Pa)	○	Flow	
Wetland (La)	○	No flow	○
Wetland (Es)	○	Flowing	✓

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37.679891
144.375309
Downstream
-37.679163
144.379223

Comments

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy	Collector	Site code	Gear codes
11/5/22	Helper 1: ML	Waterbody: Werribee R	Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
	Helper 2:		Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	12:50	14:00	14:10	14:20	14:30	14:40	14:50	15:00	13:45	::
Time (24hr) End	14:00	14:10	14:20	14:30	14:40	14:50	15:00	15:10	15:15	::
Date (dd/mm/yy) Start	11/5/22	//22	//22	//22	//22	//22	//22	//22	//22	//22
Date (dd/mm/yy) End	//22	//22	//22	//22	//22	//22	//22	//22	//22	//22
Method	BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets / e'fish length (m) / start (sec)	0	150	300	450	600	750	900	1050	10 mins	
mesh (mm) / end (sec)	150	300	450	600	750	900	1050	1200		
Volts	110	110	110	110	110	110	110	110		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	12	12	12	12	12	12	12	12		
amps	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
Tench	3 (___)	1 (___)	___ (___)	1 (___)	1 (___)	2 (___)	___ (___)	___ (___)	___ (___)	___ (___)
SFE	1			1		1				
Roach			9(2)				2(5)			
Redfin			6	2	2	1	1	2		
Spiny Cray										
Smelt						1				
						1				

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MW.F.RS.2

Biological page # (e.g. 1/5) 1/2

WER-30289-9

BIOLOGICAL RECORD Melbourne Water

dd mm yy	Collector	Site code	Health Codes (disease, parasite, deformities)
11/5/22	Helper 1 JL	Waterbody Werribee R	D - Deformity (skeletal, eye, fins, asymmetric etc.) · F - Fin condition poor (broken, eroded) · G - Fungus · L - Lernaea (only when notable) · O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph) · P - Other parasites (leech, lamprey, isopod) · S - Lesions (raised or reddish skin or scales) · T - Tumour (localised abnormal growth) · U - Ulcer (skin is broken, crater like, redness) · W - Wounds (e.g. bird strikes, hook wounds)
	Helper 2		

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-ssine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	EF	1	Tench	1	164	TL	72				
2	"	"	Tench	2	161	"	72				
3	"	"	SF Eel	1	700 713	"	1042				
4	"	"	Tench	3	122	"	32				
5	"	2	Tench	4	115	"	32				
6	"	3	Roach	1	158	CF	62				
7	"	"	"	2	143	"	42				
8	"	"	"	3	156	"	52				
9	"	"	"	4	168	"	79				
10	"	"	"	5	155	"	52				
11	"	"	"	6	147	"	56	F			
12	"	"	"	7	161	"	55				
13	"	3	"	8	156	"	60				
14	"	3	"	9	154	"	63				
15	"	3	Rudd	1	179	TL	82				
16	"	3	"	2	166	"	52				
17	"	3	"	3	161	"	49				
18	"	3	"	4	152	"	51				
19	"	3	"	5	164	"	70				
20	"	3	"	6	164	"	73				
21	"	4	SF Eel	2	692	"	1023				
22	"	4	roach	3	166	"	64				
23	"	4	"	8	183	"	91				
24	"	4	Tench	5	164	"	80				
25	"	5	"	6	154	"	71				

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WER-30289-9

MW.F.RS.2

Biological page # (e.g. 1/5) 2 / 2

BIOLOGICAL RECORD Melbourne Water

dd mm yy	Collector	Site code	Health Codes (disease, parasite, deformities)
11 / 5 / 22	Collector: TL Helper 1: ML Helper 2:	Site code: Werribee [illegible] Waterbody: [illegible]	D - Deformity (skeletal, eye, fins, asymmetric etc.) F - Fin condition poor (broken, eroded) G - Fungus L - Lernaea (only when notable) O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph) P - Other parasites (leech, lamprey, isopod) S - Lesions (raised or reddish skin or scales) T - Tumour (localised abnormal growth) U - Ulcer (skin is broken, crater like, redness) W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-saine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	5	Redfin	9	166	TL	64				
2	|	5	"	10	137	|	32				
3		6	SF Eel	3	247		40				
4		|	[illegible]	1	94		25				
5		|	Short Ft	1	57		2				
6		|	Roach	7	149	|	>32				
7		↓	"	9	105	|	16				
8		7	Redfin	11	168	↓	60				
9		7	Roach	10	162	LCF	54				
10		|	"	11	143	|	32				
11		↓	Redfin	12	167	TL	58				
12		8	Redfin	13	169	|	59				
13	↓	↓	Redfin	14	179	↓	63				
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy	Collector	Site code	Instructions
11 / 5 / 22	Helper 1: M.L.	Waterbody: Werribee R.	Mark circles with cross or fill in. Leave boxes blank if the item was not seen. Definitions for some items are on first sheet.
	Helper 2:		

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	●	●	●	●	●	Bedrock	●	●	●	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	●	●	●	●	●	Mid/silt (0.002-0.6 mm)	●	●	●	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	●	●	●	Native trees	●	●	●	○	○	Native trees
Exotic trees	●	●	●	●	●	Exotic trees	●	●	●	○	○	Exotic trees
Native shrubs	●	●	●	●	●	Native shrubs	●	●	●	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	●	●	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	●	●	●	●	●	Emergent macrophytes	●	●	●	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	○	○	○	○	○	Submerged macrophytes
Filamentous algae	●	●	●	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	Biofilms	●	●	●	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	●	●	●	○	○	Rock	○	○	○	○	○	Rock
Timber	○	○	○	○	○	Timber	○	○	○	○	○	Timber
Undercuts	●	●	●	○	○	Undercuts	○	○	○	○	○	Undercuts
Leaf litter	○	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	●	●	●	○	○	Macrophytes	○	○	○	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	●	●	●	○	●	Pools	○	○	○	○	○	Pools
Run	○	○	○	●	○	Run	●	●	●	○	○	Run
Riffle	○	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	S	S	S	M	S	Velocity (F, M, S, NF)	M	M	M	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	10	10	10	3	10	Average wetted width (m)	4	4	4	___	___	Average width (m)
Average depth (m)	0.5	0.5	0.5	0.5	0.5	Average depth (m)	0.5	0.5	0.5	___	___	Average depth (m)
Distance travelled (m)	15	15	15	15	15	Distance travelled (m)	15	15	15	___	___	Distance travelled (m)

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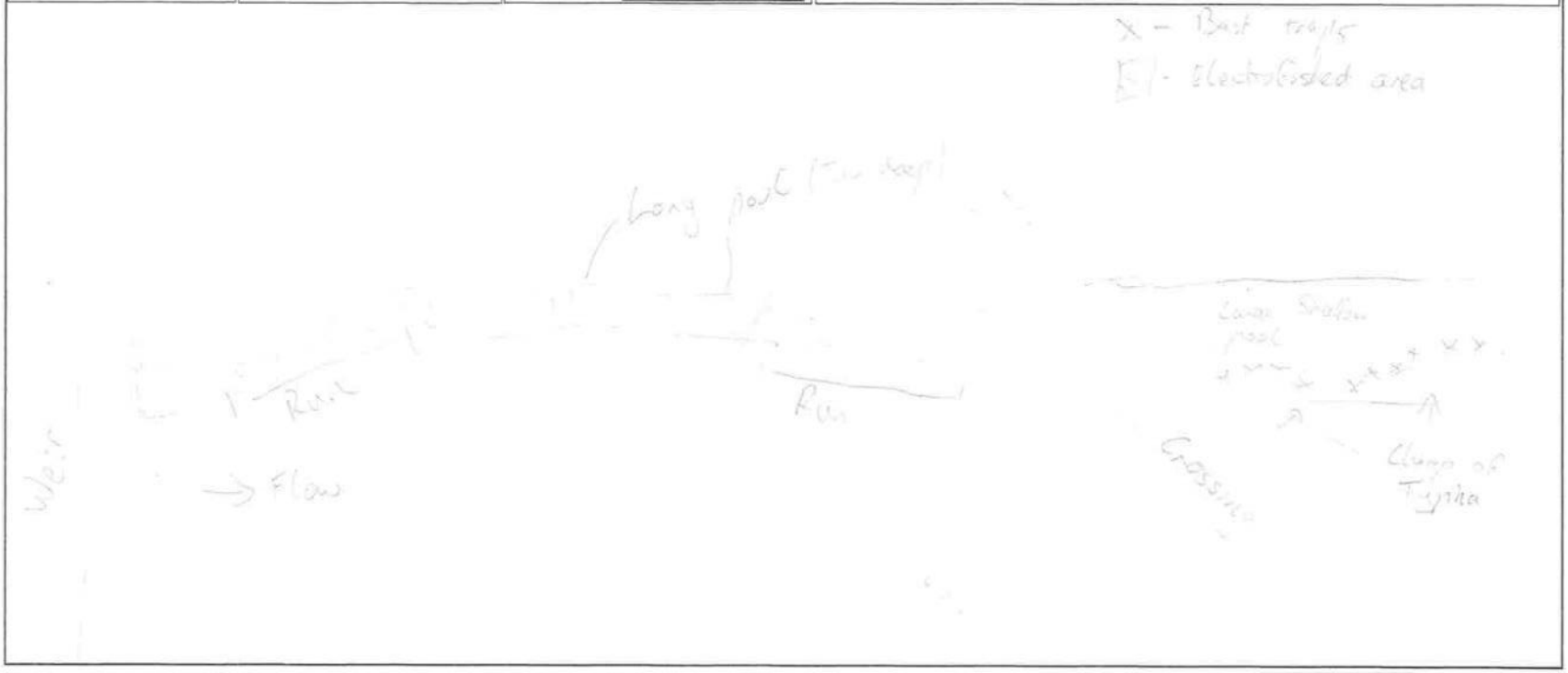
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
11/5/22	J.L.	WER-30289-9	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody Werribee R.	



Comments:

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TUPONG, GALAXIAS, BF 0225,

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

MW.F.RS.1

Date sample began dd / mm / yy	Collector	Site code	Waterbody
25 / 5 / 22	D. I	WER-138085-6	WERRIBEE RIVER - LOWER.
	Helper 1 J. S	Location description: D/S LOWER DIVERSION ACCESS FROM RED CHURN CLOSE OR THE OLD FORD	
	Helper 2		

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.3	11.8	7.33	1503	10		9.04	84.8

Bottom depth (m) ~1m Date & Time of Sampling 25 / 5 / 22 14:00:

Platypus
Seen ○
Not seen ●

Conditions

Waterbody		Weather	
Stream	●	Sunny	●
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	●
Estuary	○		
Wetland (Pa)	○	**Flow**	
Wetland (La)	○	No flow	○
Wetland (Es)	○	Flowing	●

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37.88309
144.64044
Downstream
-37.88260
144.64074

Comments

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) 1 / 1

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 25 / 5 / 22

Collector: D. T
Helper 1: J. S.
Helper 2:

Site code: WER-138058-6
Waterbody: WERRIBEE

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	13:41	13:48	14:00	14:06	14:13	14:13	14:19	14:26	13:30	:
Time (24hr) End	13:47	13:54	14:05	14:12	14:17	14:18	14:25	14:32	14:40	:
Date (dd/mm/yy) Start	25/5/22	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Date (dd/mm/yy) End	25/5/22	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Method	EF									
nets length (m) / e'fish start (sec)	0	ALL SAME FOR EF								
mesh (mm) / end (sec)	150									
Volts	120									
pulses per sec										
% duty cycle (range)	20									
amps	3									

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
GAL MAC	20 (0)	15 (9)	10 (8)	9 (12)		1 (0)	3 (0)		3 (0)	
PHI GRA	2 (0)	1	1	0 (1)					3 (0)	
GAM HOL	2 (0)	5								
ANG AUS	250 1 (0	300 1	3 (0)	350 1 (0)		150 430 5 (0) 400	294 352 4 (0) 300 250			
Tupong						0 (1)	1 (0)	1 (0)		

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MW.F.RS.2

Biological page # (e.g. 1/5) 1 / 3

BIOLOGICAL RECORD Melbourne Water

dd	mm	yy
25	5	22

Collector: D I
Helper 1: J S
Helper 2:

Site code: WGK-138085-6
Waterbody: WERRIBEE

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	EF	1	GAL MAC	1	123	LCF	14				
2	"	1	"	2	72	"					
3	"	1	"	3	68	"					
4	"	1	"	4	67	"					
5	"	1	"	5	63	"					
6	"	1	"	6	62	"					
7	"	1	"	7	58	"					
8	"	1	"	8	74	"					
9	"	1	"	9	64	"					
10	"	1	"	10	56	"					
11	"	1	"	11	57	"					
12	"	1	"	12	70	"					
13	"	1	"	13	62	"					
14	"	1	"	14	54	"					
15	"	1	"	15	140	"	22				
16	"	1	"	16	65	"					
17	"	1	"	17	78	"					
18	"	1	"	18	63	"					
19	"	1	"	19	64	"					
20	"	1	GAL MAC	20	58	"					
21	"	1	PHI GRA	1	70	TL	2				
22	"	1	PHI GRA	2	66	"	2				
23	"	1	GAM HOL	1	23	"					
24	"	1	ANG AUS	1	250	"					
25	"	2	GAL MAC	21	57	LCF					

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MW.F.RS.2

Biological page # (e.g. 1/5) 2 / 3

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 25 / 5 / 22

Collector: D.I
Helper 1: J.S
Helper 2:

Site code: WER-138055-6
Waterbody: WERIBEE

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	EF	2	GAL MAC	22	63	LCF					
2	"	2	"	23	64	"					
3	"	2	"	24	62	"					
4	"	2	"	25	76	"					
5	"	2	"	26	157	"	29				
6	"	2	"	27	158	"	30				
7	"	2	"	28	82	"					
8	"	2	"	29	55	"					
9	"	2	"	30	67	"					
10	"	2	"	31	66	"					
11	"	2	"	32	63	"					
12	"	2	"	33	58	"					
13	"	2	"	34	64	"					
14	"	2	GAL MAC	35	62	"					
15	"	2	PHI GRA	3	72	TL	3				
16	"	2	GAM HOL	2	26	"	1				
17	"	2	"	3	32	"					
18	"	2	"	4	26	"					
19	"	2	"	5	25	"					
20	"	2	GAM HOL	6	25	"					
21	"	2	ANG AUS	2	150	"					
22	"	3	ANG AUS	3	385	"					
23	"	3	"	4	200	"					
24	"	3	"	5	240	"					
25	"	3	ANG AUS	6	280	"					

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MW.F.RS.2

Biological page # (e.g. 1/5) 3/3

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 25/5/22

Collector: D.I.
Helper 1: J.S.
Helper 2:

Site code: WER-138085-6
Waterbody: WERRIBEE R.

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	EF	4	ANG AUS	7	350	TL					
2	"	4	GAM HOL	7	27	"					
3	"	4	GAM HOL	8	28	"					
4	"	6	ANG AUS	8	130	"					
5	"	6	"	9	430	"					
6	"	6	"	10	200	"					
7	"	6	"	11	300	"					
8	"	6	ANG AUS	12	400	"					
9	"	7	ANG AUS	13	220	"					
10	"	7	"	14	350	"					
11	"	7	"	15	300	"					
12	"	7	ANG AUS	16	260	"					
13	"	7	Tupong	1	284	"	196				
14	"	8	Tupong	2	253	"	150				
15	EF	8	PHI GRA	4	72	"	3				
16											
17	BT	1	PHI GRA	5	52	"	1				
18	BT	1	PHI GRA	6	46	"	1				
19	BT	1	PHI GRA	7	38	"	1				
20											
21											
22											
23											
24											
25											

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MW.F.RS.4

Habitat page # (e.g. 1/3) 1/1

HABITAT RECORD Melbourne Water

dd mm yy: 25 / 5 / 22

Collector: DI
Helper 1: JS
Helper 2:

Site code: WHL-138085-6.
Waterbody: WHITE BEE

Instructions

Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	●	●	●	●	●	Boulder (>120 mm)	●	●	●	●	○	Boulder (>120 mm)
Cobble (60-200 mm)	●	○	○	●	●	Cobble (60-200 mm)	●	●	●	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	●	●	Gravel (2-60 mm)	●	●	●	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	●	●	●	●	●	Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	●	●	●	Native trees	●	●	●	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	●	●	●	○	○	Native shrubs	○	●	●	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	○	○	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	●	●	●	○	○	Emergent macrophytes	●	○	○	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	○	○	○	○	○	Submerged macrophytes
Filamentous algae	●	●	●	●	●	Filamentous algae	●	●	●	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	Biofilms	●	●	●	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	●	●	●	●	●	Rock	●	●	●	○	○	Rock
Timber	●	●	●	○	○	Timber	○	●	●	○	○	Timber
Undercuts	○	○	○	○	○	Undercuts	○	○	○	○	○	Undercuts
Leaf litter	○	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	●	●	●	○	○	Macrophytes	○	○	○	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	○	○	○	○	○	Pools	●	●	●	○	○	Pools
Run	○	○	○	○	○	Run	○	○	○	○	○	Run
Riffle	○	○	○	●	●	Riffle	●	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	●	●	●	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	S	S	S	M	M	Velocity (F, M, S, NF)	M	S	S			Velocity (F, M, S, NF)
Average wetted width (m)	10	10	8	6	8	Average wetted width (m)	6	12	12			Average width (m)
Average depth (m)	0.5	0.5	0.5	0.3	0.2	Average depth (m)	0.3	0.5	0.7			Average depth (m)
Distance travelled (m)	15	15	15	15	15	Distance travelled (m)	15	10	10			Distance travelled (m)

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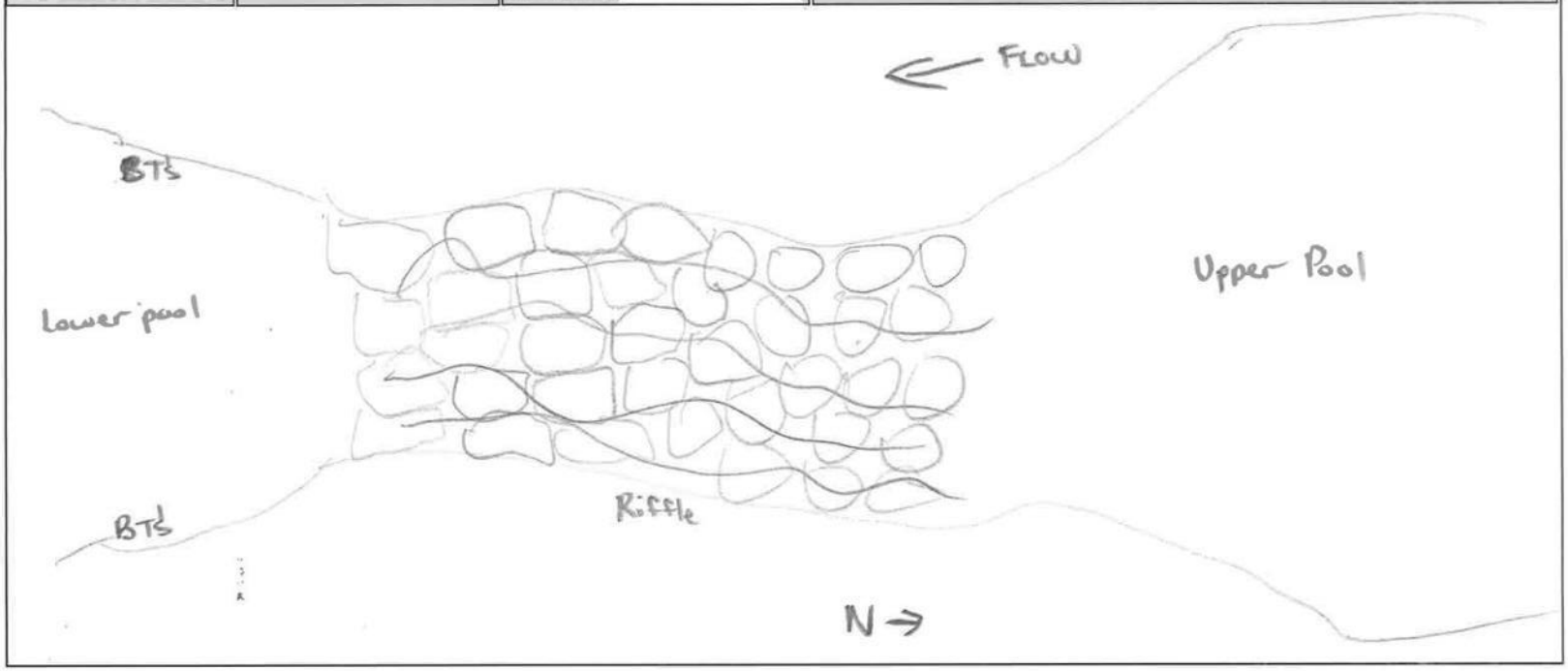
MW.F.RS.5

Site map page # (e.g. 1/2) 1 / 1 **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
25 / 5 / 22	J.S	WER-138085-6	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody WERR. BST	



Comments:

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FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION

Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
11/05/22	Jackson	Werribee - Large	Werribee River
	Helper 1 Matt		
	Helper 2		

Location description: Parking at Meikles Point Picnic Area

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	11.4	7.38	504	5.02	–	8.20	76.1

Bottom depth (m) _____ Date & Time of Sampling 11/05/22 12:40

Platypus
Seen ○
Not seen ⊗

*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Conditions

Waterbody		Weather	
Stream	✓	Sunny	○
Channel	○	Cloudy	✓
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○		
Farm dam	○	Tidal	
Billabong	○	Yes	○
Estuary	○	No	✓
Wetland (Pa)	○	Flow	
Wetland (La)	○	No flow	○
Wetland (Es)	○	Flowing	✓

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37.671359
144.360792
Downstream
-37.672539
144.362532

Comments

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 11 / 5 / 22

Collector: J.L
Helper 1: M.L
Helper 2:

Site code: Werribee Gorge
Waterbody: Werribee R.

Gear codes

Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat

Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #		1	2	3	4	5	6	7	8	9	10
Time (24hr)	Start	11:20	11:30	11:40	11:50	12:00	12:10	12:20	12:30	11:10	::
	End	11:30	11:40	11:50	12:00	12:10	12:20	12:30	12:40	12:50	::
Date (dd/mm/yy)	Start	11/5/22	////	////	////	////	////	////	////	////	////
	End	////	////	////	////	////	////	////	////	////	////
Method		BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / e'fish start (sec)		0	150	300	450	600	750	900	1050	10 mins	
mesh (mm) / end (sec)		150	300	450	600	750	900	1050	1200		
Volts		130	130	130	130	130	130	130	130		
pulses per sec		30	30	30	30	30	30	30	30		
% duty cycle (range)		12	12	12	12	12	12	12	13		
amps		2	2	2	2	2	2	2	2		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
Blackfish	9 (___)	1 (___)	4 (___)	___ (___)	___ (___)	2 (___)	2 (___)	1 (___)	___ (___)	___ (___)
Spiny Crey	3	2(2)	1	2		2	1	3		
Yabby			1							

MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy	Collector	Site code	Instructions
11 / 5 / 22	J.L.	Werribee Gorge	Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
	Helper 1 M.L.	Waterbody Werribee R.	Definitions for some items are on first sheet.
	Helper 2		

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	◒	◔	◔	Bedrock	◔	◔	○	○	○	Bedrock
Boulder (>120 mm)	◔	◔	◔	◔	◔	Boulder (>120 mm)	◔	◔	◔	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	◔	◔	◔	◔	◔	Cobble (60-200 mm)	◔	◔	◔	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	◔	◔	◔	◔	◔	Gravel (2-60 mm)	○	○	◔	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	◔	◔	◔	◔	◔	Sand (0.6-2 mm)	○	○	◔	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	◔	◔	◔	◔	◔	Mid/silt (0.002-0.6 mm)	◔	◔	◔	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	◔	◔	○	○	○	Native trees	◔	◔	◔	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	◔	◔	◔	◔	◔	Native shrubs	◔	◔	◔	○	○	Native shrubs
Riparian grass	◔	◔	◔	◔	◔	Riparian grass	◔	◔	◔	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	◔	◔	◔	◔	◔	Emergent macrophytes	◔	◔	◔	○	○	Emergent macrophytes
Submerged macrophytes	◔	○	○	○	○	Submerged macrophytes	◔	◔	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	◔	◔	◔	◔	◔	Biofilms	◔	◔	◔	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	◔	◔	◔	◔	◔	Rock	◔	◔	◔	○	○	Rock
Timber	◔	◔	◔	○	○	Timber	◔	◔	○	○	○	Timber
Undercuts	○	◔	◔	○	○	Undercuts	○	○	○	○	○	Undercuts
Leaf litter	◔	○	○	○	○	Leaf litter	◔	○	○	○	○	Leaf litter
Macrophytes	◔	○	○	◔	◔	Macrophytes	◔	◔	◔	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	◔	◔	◔	○	○	Pools	◔	◔	○	○	○	Pools
Run	○	○	○	◔	◔	Run	○	○	◔	○	○	Run
Riffle	○	○	○	◔	◔	Riffle	○	○	◔	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	S	S	S	M	M	Velocity (F, M, S, NF)	S	S	M	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	5	5	5	3	3	Average wetted width (m)	10	10	3	___	___	Average width (m)
Average depth (m)	0.6	0.8	0.8	0.5	0.4	Average depth (m)	0.8	0.8	0.2	___	___	Average depth (m)
Distance travelled (m)	15	15	15	15	15	Distance travelled (m)	15	15	15	___	___	Distance travelled (m)

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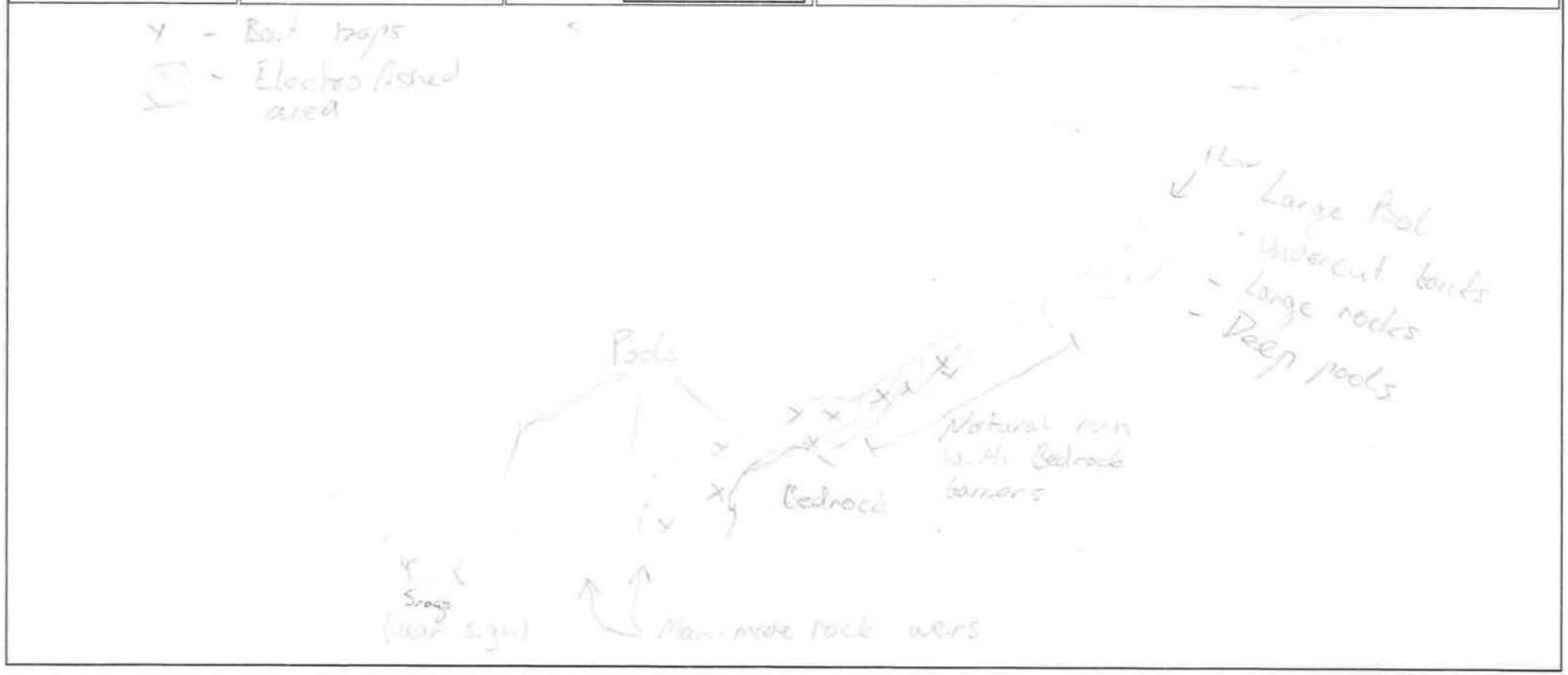
MW.F.RS.5

Site map page # (e.g. 1/2) ____/____ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
____/____/____	_____	Waterbody	Draw picture to help explain location, site details etc., if required or needed.



Comments: _____

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MW.F.RS.2

Biological page # (e.g. 1/5) 1/2

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 11/5/22

Collector: TL

Helper 1: NL

Helper 2:

Site code: WERRIBEE GOR

Waterbody: Werribee

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	B. Fish	1	134	TL	62				
2		1	B. Fish	2	[illegible]		[illegible]				
3		1	B. Fish	3	53		2				
4		1	B. Fish	4	55		2				
5		1	So Cray	1	[illegible]		3				
6		1	S. Cray	2	43		3				
7		1	S. Cray	3	[illegible]		3				
8		2	B. Fish	5	85		5				
9		2	S. Cray	4	[illegible]		1				
10		2	S. Cray	5	[illegible]		3				
11		3	B. Fish	6	[illegible]		[illegible]				
12		3	B. Fish	7	[illegible]		[illegible]				
13		3	B. Fish	8	79		4				
14		3	S. Cray	6	[illegible]		[illegible]				
15		3									
16		3	Yabby	1	53		2		M		
17		4	B. Fish	7	71		3				
18		4	S. Cray	7	40		2				
19		4	S. Cray	9	75		3				
20		6	B. Fish	10	191		63				
21		6	B. Fish	11	137		17				
22		6	S. Cray	9	37		2				
23		6	S. Cray	10	32		3				
24		7	B. Fish	12	110		12				
25	V	7	B. Fish	13	116	V	1				

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MW.F.RS.2

Biological page # (e.g. 1/5) 2/2

BIOLOGICAL RECORD Melbourne Water

dd	mm	yy
11	5	22

Collector: JL
Helper 1: ML
Helper 2:

Site code: Werribee Gorge
Waterbody: Werribee R.

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. **Length codes:** TL-Total length, LCF-Length to Caudal Fork. **Reproductive Condition:** E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	7	S. Carp	#11	34	TL	3				
2	"	8	S. Carp	12	42	"	3				
3	"	8	S. Carp	13	45	"	3				
4	"	8	S. Carp	14	36	"	3				
5	"	8	R. Fish	14	54	"	1				
6											
7											
8											
9											
10											
11											
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23											
24											
25											

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LER-22832-7

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION

Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
11 / 05 / 22	Jackson	Lerderderg R U	Lerderderg River
	Helper 1 Matt	Location description: Access from MacKenzies Flat Picnic Area	
	Helper 2		

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	12.4	7.90	160.3	2.02	—	7.19	92.5

Bottom depth (m) _____ Date & Time of Sampling 11 / 5 / 22 : 7 : 50

Platypus
Seen ○
Not seen ⊘

*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Conditions

Waterbody		Weather	
Stream	✓	Sunny	○
Channel	○	Cloudy	✓
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○		
Farm dam	○	Tidal	
Billabong	○	Yes	○
Estuary	○	No	✓
Wetland (Pa)	○	Flow	
Wetland (La)	○	No flow	○
Wetland (Es)	○	Flowing	✓

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37 . 613161
144 . 421896

Downstream
-37 . 614682
144 . 424944

Comments

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy	Collector	Site code	Gear codes
11 / 5 / 22	Collector: J.L	Site code: LER-22832-7	Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
	Helper 1: M.L	Waterbody: Lerderderg R.	Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net
	Helper 2:		

Operation #		1	2	3	4	5	6	7	8	9	10
Time (24hr)	Start	7:43	7:53	8:03	8:13	8:23	8:33	8:43	8:53	7:40	
	End	7:53	8:03	8:10	8:23	8:33	8:43	8:53	9:03	9:10	
Date (dd/mm/yy)	Start	11/5/22									
	End										
Method		BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / *e'fish* start (sec)		0	150	300	450	600	750	900	1050	1200	
mesh (mm) / end (sec)		150	300	450	600	750	900	1050	1200		
Volts		200	200	200	200	200	200	200	200		
pulses per sec		30	30	30	30	30	30	30	30		
% duty cycle (range)		12	12	12	13	12	12	12	12		
amps		1.9	1.8	1.9	1.8	1.9	1.8	1.8	1.8		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
Y/FISH	2 (0)	1 (0)	2 (0)	1 (3)	2 (0)	4 (0)	1 (5)	1 (0)	( )	( )
G. Brevipinnis (Blue-Eye)			2	3	2	3	1	2		
								1		

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MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy ___/___/___

Collector
Helper 1
Helper 2

Site code
Waterbody

Instructions
Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	6	7	8	9	10	Operation #
Substrate											***Substrate***
Bedrock	○	○	○	○	○	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	○	○	○	○	○	○	○	○	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	○	○	○	○	○	○	○	○	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	○	○	○	○	○	Unknown
Plants											***Plants***
Native trees	○	○	○	○	○	○	○	○	○	○	Native trees
Exotic trees	○	○	○	○	○	○	○	○	○	○	Exotic trees
Native shrubs	○	○	○	○	○	○	○	○	○	○	Native shrubs
Riparian grass	○	○	○	○	○	○	○	○	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	○	○	○	○	○	○	○	○	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	○	○	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	○	○	○	○	○	Suspended algae
Biofilms	○	○	○	○	○	○	○	○	○	○	Biofilms
Cover											***Cover***
Rock	○	○	○	○	○	○	○	○	○	○	Rock
Timber	○	○	○	○	○	○	○	○	○	○	Timber
Undercuts	○	○	○	○	○	○	○	○	○	○	Undercuts
Leaf litter	○	○	○	○	○	○	○	○	○	○	Leaf litter
Macrophytes	○	○	○	○	○	○	○	○	○	○	Macrophytes
Mesohabitat											***Mesohabitat***
Pools	○	○	○	○	○	○	○	○	○	○	Pools
Run	○	○	○	○	○	○	○	○	○	○	Run
Riffle	○	○	○	○	○	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	S	S	S	S	S	S	S	S	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	20	20	20	10	20	20	20	20	___	___	Average width (m)
Average depth (m)	1	1	0.5	0.5	0.5	0.5	0.5	0.5	___	___	Average depth (m)
Distance travelled (m)	15	15	15	15	15	15	15	15	___	___	Distance travelled (m)

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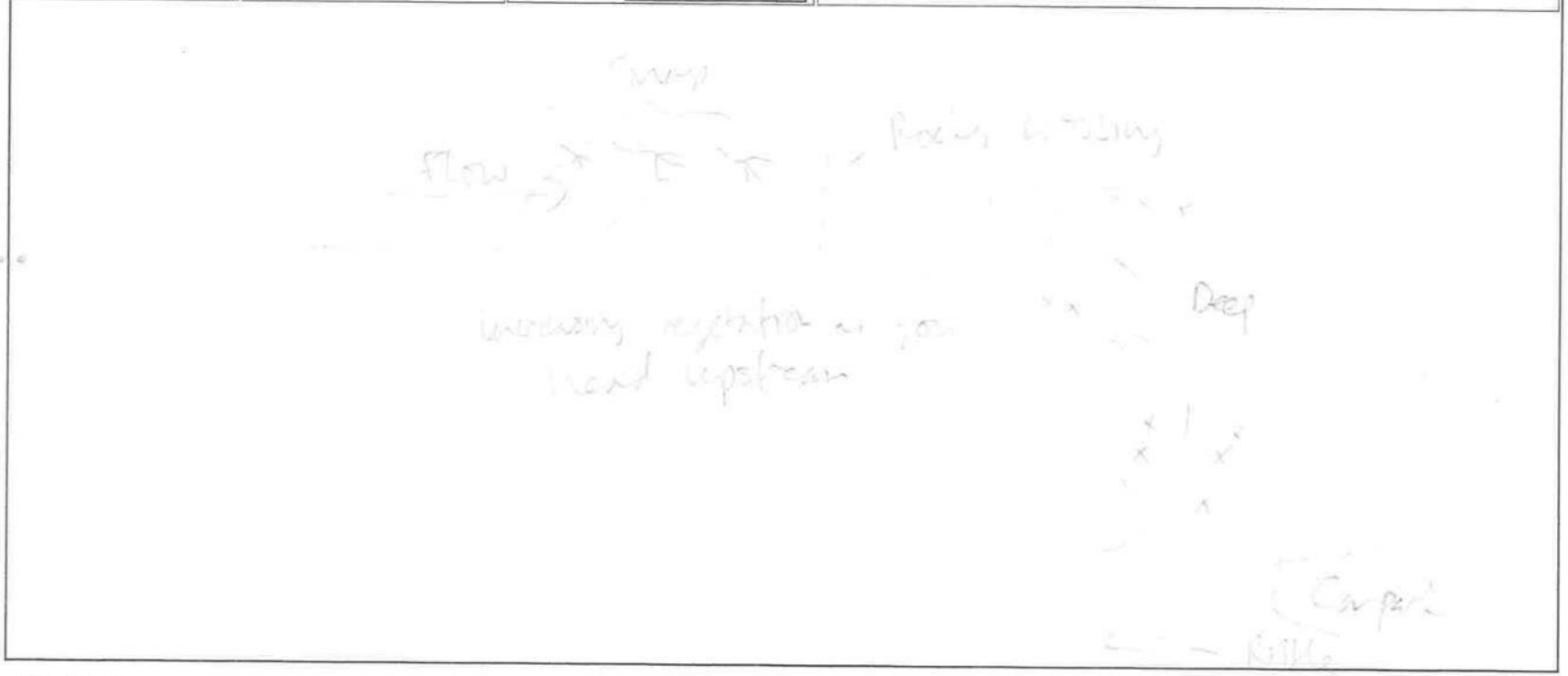
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
___/___/___	_____	Waterbody	Draw picture to help explain location, site details etc., if required or needed.



Comments:

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MW.F.RS.2

LER-22822-7

BIOLOGICAL RECORD Melbourne Water

Biological page # (e.g. 1/5) ___/___

dd mm yy	Collector	Site code	Health Codes (disease, parasite, deformities)
___/___/___	Helper 1	Waterbody	D - Deformity (skeletal, eye, fins, asymmetric etc.)
	Helper 2		F - Fin condition poor (broken, eroded)
			G - Fungus
			L - Larnaea (only when notable)
			O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
			P - Other parasites (leech, lamprey, isopod)
			S - Lesions (raised or reddish skin or scales)
			T - Tumour (localised abnormal growth)
			U - Ulcer (skin is broken, crater like, redness)
			W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-Fyke net, L-larval net. Length codes: TL-total length, LCF-length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
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											

Rrev = G. ornatus (Jones Shelley)

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MW.F.RS.2

Biological page # (e.g. 1/5) ___/___

BIOLOGICAL RECORD Melbourne Water

dd mm yy	Collector	Site code	Health Codes (disease, parasite, deformities)
11 / 5 / 22	Helper 1 J.L	LER-22832-7	D - Deformity (skeletal, eye, fins, asymmetric etc.) · F - Fin condition poor (broken, eroded) · G - Fungus · L - Lernaea (only when notable) · O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph) · P - Other parasites (leech, lamprey, isopod) · S - Lesions (raised or reddish skin or scales) · T - Tumour (localised abnormal growth) · U - Ulcer (skin is broken, crater like, redness) · W - Wounds (e.g. bird strikes, hook wounds)
	Helper 2	Waterbody Lerderderg R	

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. **Length codes**: TL-Total length, LCF-Length to Caudal Fork. **Reproductive Condition**: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	8	YAR	15		TL					
2		8	Brow	12	56	|	1	P			White spots under skin
3		8	Brow	13	57	|	1	P			"
4		8	Brow	14	55	|	1				
5		8	Brow	15	62	V	1	O			"
6		8	Rainbow	1	330	TL	245				
7		8	Brow	16	57	|	1	P			"
8	RT	9	Brow	17	54	V	1				
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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DPW-63085-7

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION

Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
10/05/22	Jackson	Deep - Low	Deep Creek
	Helper 1 Matt		
	Helper 2		

Location description: Access via Konogaderra Bridge Reserve

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	10.9	7.20	1168	9.12	~	6.39	59.3

Bottom depth (m) _____ Date & Time of Sampling 10/5/22 12:30

Platypus
Seen ○
Not seen ⊗

*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Conditions

Waterbody		Weather	
Stream	✓	Sunny	○
Channel	○	Cloudy	✓
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○		
Farm dam	○	Tidal	
Billabong	○	Yes	○
Estuary	○	No	✓
Wetland (Pa)	○	Flow	
Wetland (La)	○	No flow	○
Wetland (Es)	○	Flowing	✓

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37.551051
144.849576
Downstream
-37.552726
144.849592

Comments

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy	Collector	Site code	Gear codes
10 / 5 / 22	Helper 1: M.L	Waterbody: Deep Ck.	Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
	Helper 2:	DPW6308S-7	Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #		1	2	3	4	5	6	7	8	9	10
Time (24hr)	Start	11:00	11:10	11:20	11:30	11:40	11:50	12:00	12:10	10:50	::
	End	11:10	11:20	11:30	11:40	11:50	12:00	12:10	12:20	12:25	::
Date (dd/mm/yy)	Start	10/5/22	//	//	//	//	//	//	//	//	//
	End	//	//	//	//	//	//	//	//	//	//
Method		BP	BP	BP	BP	BP	BP	BP	BP	EST	
nets length (m) / *e'fish* start (sec)		0	150	300	450	600	750	900	1050	10 nets	
mesh (mm) / end (sec)		150	300	450	600	750	900	1050	1200		
Volts		100	100	100	100	100	100	100	100		
pulses per sec		30	30	30	30	30	30	30	30		
% duty cycle (range)		12	12	12	12	12	12	12	12		
amps		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Species Code		**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**
SFE		1 (0)	0 (0)	0 (1)	1 (3)	0 (0)	0 (0)	0 (0)	1 (6)	( )	( )

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MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy	Collector	Site code	Instructions
10 / 5 / 22	Helper 1 M.L.	Waterbody Deep Ck.	Mark circles with cross or fill in. Leave boxes blank if the item was not seen. Definitions for some items are on first sheet.
	Helper 2		

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	●	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)	●	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	●	Cobble (60-200 mm)	●	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	●	●	Gravel (2-60 mm)	●	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	●	●	●	●	●	Sand (0.6-2 mm)	●	●	●	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	●	●	●	○	○	Mid/silt (0.002-0.6 mm)	○	●	●	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	●	●	●	Native trees	●	●	●	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	●	●	●	●	●	Native shrubs	●	●	●	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	●	●	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	●	●	●	●	○	Emergent macrophytes	○	●	●	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	○	○	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	Biofilms	●	●	●	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	○	○	○	○	●	Rock	●	○	○	○	○	Rock
Timber	●	●	●	●	●	Timber	●	●	●	○	○	Timber
Undercuts	○	○	●	●	○	Undercuts	○	○	○	○	○	Undercuts
Leaf litter	●	●	●	○	○	Leaf litter	○	●	●	○	○	Leaf litter
Macrophytes	●	●	●	○	○	Macrophytes	○	●	●	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	●	●	●	○	○	Pools	○	●	●	○	○	Pools
Run	○	○	○	●	●	Run	●	○	○	○	○	Run
Riffle	○	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	M	M	M	M	M	Velocity (F, M, S, NF)	M	M	M	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	5	5	5	3	3	Average wetted width (m)	3	5	5	___	___	Average width (m)
Average depth (m)	0.8	0.9	0.8	0.6	0.3	Average depth (m)	0.3	0.8	0.8	___	___	Average depth (m)
Distance travelled (m)	15	15	15	15	15	Distance travelled (m)	15	15	15	___	___	Distance travelled (m)

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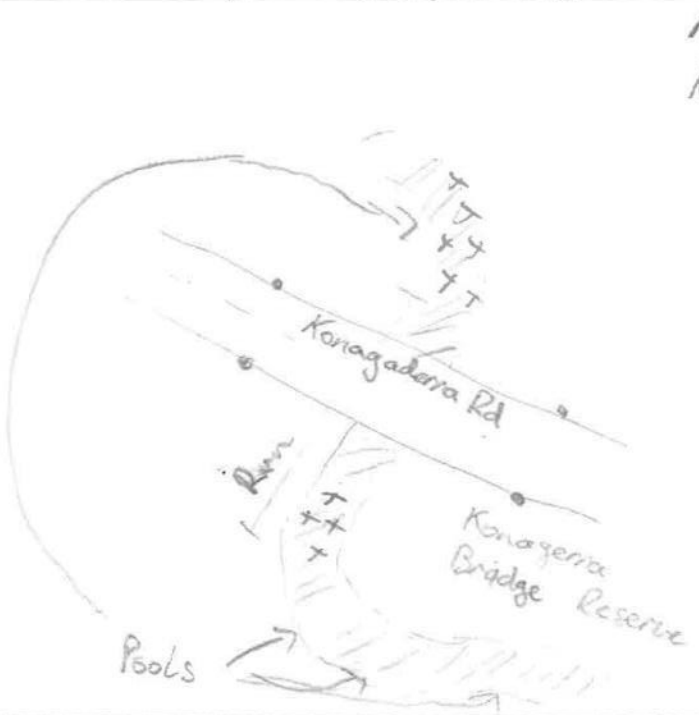
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___

SITE MAP Melbourne Water

dd mm yy	Drawer	Site code	Waterbody	Instructions
10/5/22	J.L.	DAW-63085-7	Deep Ck.	Draw picture to help explain location, site details etc., if required or needed.



Comments: Emergent Macrophytes in pools. Long run with small pools underneath bridge.

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DPW-63085-7

MW.F.RS.2

Biological page # (e.g. 1/5) ___/___ **BIOLOGICAL RECORD** Melbourne Water

dd	mm	yy
10	05	23

Collector: Jackson
Helper 1: Matt
Helper 2:

Site code: Deep Crk-Low
Waterbody: Deep Creek

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	SFE	1	462	TL	222				
2	BP	4	SFE	2	613	TL	591				
3	BP	8	SFE	3	507	TL	447				
4											
5											
6											
7											
8											
9											
10											
11											
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21											
22											
23											
24											
25											

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DPW-13586-2

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION

Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
10 / 05 / 22	Jackson	Deep Crk - Upper	Deep Creek
	Helper 1: Matt	Location description: At Musteys Bridge	
	Helper 2:		

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.

*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	11.2	7.49	643	5.92	~	5.63	51.4

Bottom depth (m) _____ Date & Time of Sampling 10 / 05 / 22 14 : 04

Platypus
Seen ○
Not seen ○

Conditions

Waterbody		Weather	
Stream	✓	Sunny	✓
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	✓
Estuary	○		
Wetland (Pa)	○	**Flow**	
Wetland (La)	○	No flow	○
Wetland (Es)	○	Flowing	✓

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37.260802
144.736058
Downstream
– .
.

Comments

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 10/5/22

Collector: JL.
Helper 1: M.L
Helper 2:

Site code: DRW-135BG-2
Waterbody: Deep Ck.

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	13:35	13:45	13:55	14:05	14:15	14:25	14:35	14:45	1455	13:30
Time (24hr) End	13:45	13:55	14:05	14:15	14:25	14:35	14:45	14:55	1505	15:20
Date (dd/mm/yy) Start	10/5/22	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Date (dd/mm/yy) End	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Method	BP								DP	BT
nets length (m) / e'fish start (sec)	0	150	300	450	600	750	900	1050	10 mins	10 nets
mesh (mm) / e'fish end (sec)	150	300	450	600	750	900	1050	1200		
Volts	120	120	120	120	120	120	120	120		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	12	12	12	12	12	12	12	12		
amps	2.6	2.6	0.6	2.6	2.6	2.6	2.6	2.6		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
Gold.ch	1 (0)	1 (0)	( )	( )	( )	( )	( )	( )	( )	( )
SPP	1	2	2						2	10
YPP		1								
SFE					1		1			
GAMBO				2			4		35	5

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MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy	Collector	Site code	Instructions
10 / 5 / 22	Helper 1 J.L.	DPW-13S06-2	Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
	Helper 2 M.L.	Waterbody Deep Ck.	Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	●	●	●	●	●	Mid/silt (0.002-0.6 mm)	●	●	●	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	○	○	○	○	○	Native trees	○	○	○	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	●	●	●	●	●	Native shrubs	●	●	●	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	●	●	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	●	●	●	●	●	Emergent macrophytes	●	●	●	○	○	Emergent macrophytes
Submerged macrophytes	●	●	●	●	●	Submerged macrophytes	●	●	●	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	Biofilms	●	●	●	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	○	○	○	○	○	Rock	○	○	○	○	○	Rock
Timber	○	○	○	○	○	Timber	○	○	○	○	○	Timber
Undercuts	○	○	○	○	○	Undercuts	○	○	○	○	○	Undercuts
Leaf litter	○	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	●	●	●	●	●	Macrophytes	●	●	●	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	●	●	●	●	●	Pools	●	●	●	○	○	Pools
Run	○	○	○	○	○	Run	○	○	○	○	○	Run
Riffle	○	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	NF	NF	NF	NF	NF	Velocity (F, M, S, NF)	NF	NF	NF	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	20	20	20	20	20	Average wetted width (m)	5	15	20	___	___	Average width (m)
Average depth (m)	0.8	0.8	0.8	0.8	0.8	Average depth (m)	0.2	0.4	0.8	___	___	Average depth (m)
Distance travelled (m)	15	15	15	15	15	Distance travelled (m)	15	15	15	___	___	Distance travelled (m)

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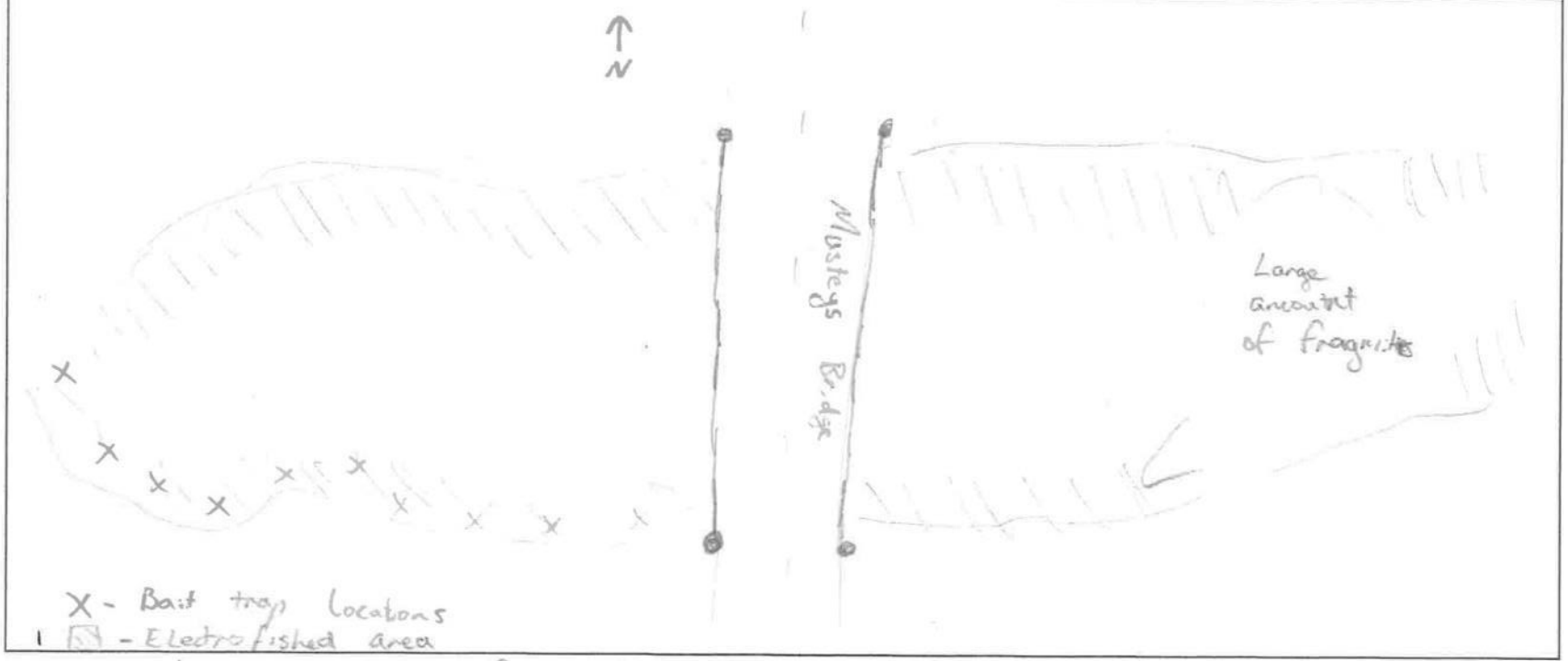
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code / Waterbody	**Instructions**
___/___/___	_____	_____ / _____	Draw picture to help explain location, site details etc., if required or needed.



Comments: Large amount of submerged macrophytes, shallow pools.

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DPW-13586-2

MW.F.RS.2

Biological page # (e.g. 1/5) 1/2

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 20/05/22

Collector: J. L

Helper 1: M. L

Helper 2:

Site code: Deep Crk - U/S

Waterbody: Deep Crk

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	Goldfish	1	219	LCF	323				
2	BP	1	SPP	1	31	TL	1				
3		2	Goldfish	2	201	LCF	235				
4		2	SPP	2	35	TL	1		M		
5		2	SPP	3	63	TL	3		M		
6		2	SPP	1	71	TL	3				
7		3	SPP	4	32	TL	1				
8		3	SPP	5	29	TL	1				
9		4	Gambo	1	24	TL	1				
10		4	Gambo	2	19	TL	1				
11		5	SFE	1	447	TL	250				
12		7	SFE	2	432	TL	221				
13		7	Gambo	3	21	TL	1				
14		7	Gambo	4	23	TL	1				
15		7	Gambo	5	17	TL	1				
16		7	Gambo	5	25	TL	1				
17	BP	9	SPP	6	25	TL	1	F			
18		9	SPP	7	19	TL	1	F			
19	BT	9	Gambo	x35							
20	BT	10	SPP	8	42	TL	2				
21		10	SPP	9	37	TL	1	F	M		
22		10	SPP	10	25	TL	1	F			
23		10	SPP	11	34	TL	1				
24		10	SPP	12	33	TL	1	F			
25		10	SPP	13	27	TL	1				

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DPW-13586-2

MW.F.RS.2

Biological page # (e.g. 1/5) 2 / 2

BIOLOGICAL RECORD Melbourne Water

dd mm yy	Collector	Site code
10 / 5 / 22	JL	Peep Ck U/ (?)
	Helper 1: ML	Waterbody: Deep Ck
	Helper 2:	

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. **Length codes:** TL-Total length, LCF-Length to Caudal Fork. **Reproductive Condition:** E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BT	10	SPP	14	23	TL	–	F			
2	↓	10	SPP	15	26	TL	–		M		
3		10	SPP	16	31	TL	–	F			
4		10	SPP	17	24	TL	–	F			
5		10	Gambo	~~8~~ 7	23	TL	–				
6		10	Gambo	~~7~~ 8	26	TL	–				
7		10	Gambo	~~8~~ 9	18	TL	–				
8		10	Gambo	~~9~~ 10	19	TL	–				
9	↓	10	Gambo	~~10~~ 11	24	TL	–				
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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8 × 150 SEC. 10 × BAIT TRAPS.
ERODING HABITAT

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
25 / 5 / 22	O. T.	MRB-130320-2	MARIBYRNONG RIVER
	Helper 1 J S	Location description: FLORA STREET KEILOR.	
	Helper 2		

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	10.4	7.32	1234	19.4		9.2	89.0

Bottom depth (m) 0.4 Date & Time of Sampling 25 / 5 / 22 11 : 00 :

Platypus
Seen ○
Not seen ⊘

*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Conditions

Waterbody		Weather	
Stream	⊘	Sunny	○
Channel	○	Cloudy	⊘
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	⊘
Estuary	○		
Wetland (Pa)	○	**Flow**	
Wetland (La)	○	No flow	○
Wetland (Es)	○	Flowing	⊘

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37.720548
144.840371
Downstream
-37.720973
144.839798

Comments

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MW.F.RS.4

Habitat page # (e.g. 1/3) 2 / 4

HABITAT RECORD Melbourne Water

dd mm yy: 25 / 5 / 20

Collector: J.S
Helper 1: D.I
Helper 2:

Site code: MRB-130320-2
Waterbody: MARIBYRNONG

Instructions
Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)	○	○	●	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	●	●	●	●	●	Cobble (60-200 mm)	●	●	●	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	●	●	●	●	●	Gravel (2-60 mm)	●	●	●	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	○	●	●	●	●	Sand (0.6-2 mm)	●	●	●	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	●	○	○	○	○	Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	●	○	○	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	○	○	○	Native trees	○	○	●	○	○	Native trees
Exotic trees	●	●	●	●	●	Exotic trees	●	●	●	○	○	Exotic trees
Native shrubs	●	●	●	●	●	Native shrubs	●	●	●	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	●	●	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	●	○	○	○	●	Emergent macrophytes	●	●	●	○	○	Emergent macrophytes
Submerged macrophytes	○	●	○	●	○	Submerged macrophytes	○	○	●	○	○	Submerged macrophytes
Filamentous algae	●	●	●	●	●	Filamentous algae	●	●	●	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	Biofilms	●	●	●	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	○	●	●	●	●	Rock	●	●	●	○	○	Rock
Timber	●	○	○	○	○	Timber	○	○	○	○	○	Timber
Undercuts	●	○	○	○	○	Undercuts	○	○	○	○	○	Undercuts
Leaf litter	○	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	●	○	○	●	●	Macrophytes	●	●	●	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	●	○	○	○	○	Pools	○	○	●	○	○	Pools
Run	○	○	○	○	○	Run	○	○	○	○	○	Run
Riffle	○	●	●	●	●	Riffle	●	●	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	●	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	NF	S-NF	S	S	S	Velocity (F, M, S, NF)	S	S	NF			Velocity (F, M, S, NF)
Average wetted width (m)	20	15	15	15	15	Average wetted width (m)	2	8	20			Average width (m)
Average depth (m)	0.5	0.2	0.3	0.3	0.3	Average depth (m)	0.3	0.2	0.4			Average depth (m)
Distance travelled (m)	15	15	10	10	10	Distance travelled (m)	20	10	12			Distance travelled (m)

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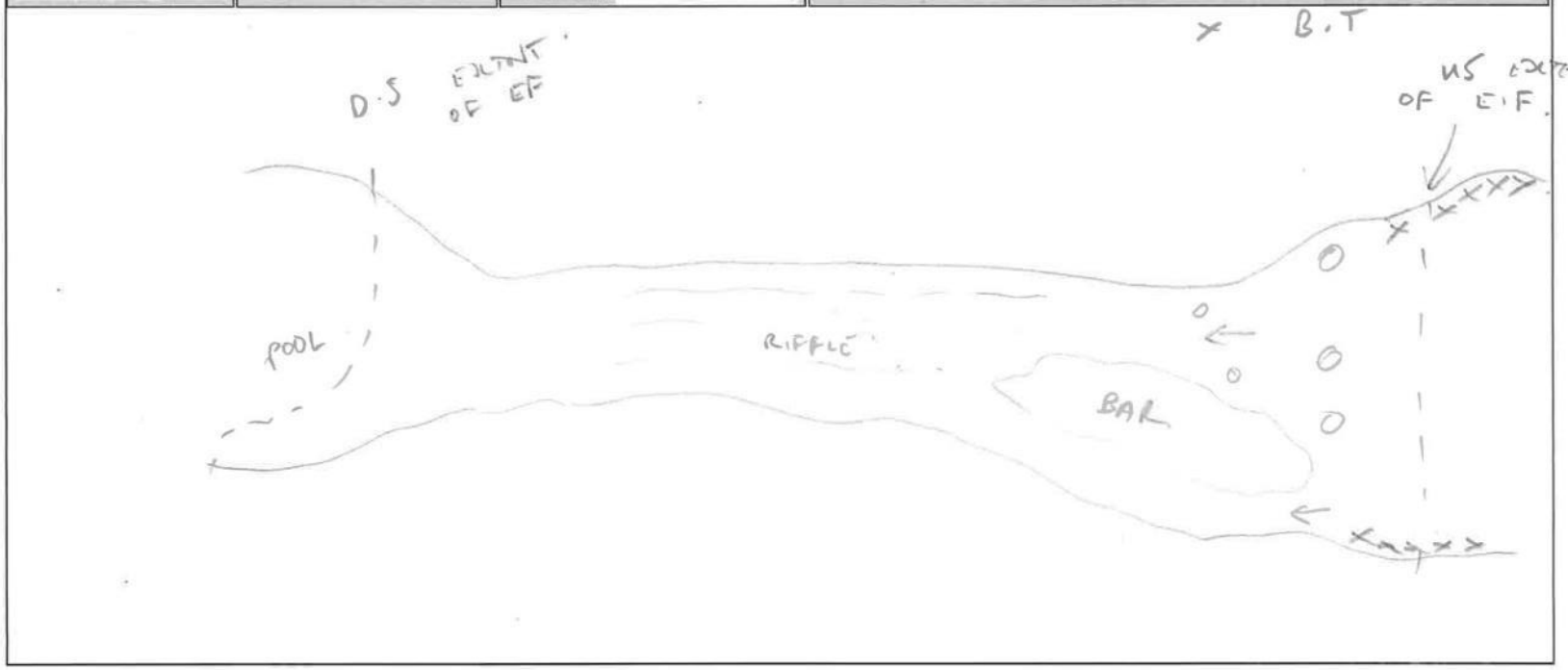
MW.F.RS.5

Site map page # (e.g. 1/2) 3 / 4 **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
25 / 5 / 22	D.I	MRB-130320-2	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody MARIBO	



Comments:

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) 1 / 4

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy	Collector	Site code	Gear codes
25 / 5 / 22	Helper 1 D.T	Waterbody MANLYNONG	Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net
	Helper 2		

Operation #		1	2	3	4	5	6	7	8	9	10
Time (24hr)	Start	11:15:00	11:22:	11:26:	11:29:	11:35:	11:40:	11:50:	11:57:	11:00:	::
	End	11:20:00	11:25:	11:29:	11:34:	11:39:	11:45:	11:55:	12:03:	12:15:	::
Date (dd/mm/yy)	Start	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
	End	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Method		BP							BP	BT	
nets length (m) / e'fish start (sec)											
mesh (mm) / end (sec)											
Volts		150.									
pulses per sec		50.									
% duty cycle (range)		20.									
amps		4.1									
Species Code		**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**
PHY GRA		2				1					
GAL MAC		(1)			2		2		1	NO	
TUPONC					1		1			FISH	
ANG AUS						1 ~730		1 ~650	2 ~510 ~600		

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MW.F.RS.2

Biological page # (e.g. 1/5) #4/#4 **BIOLOGICAL RECORD** Melbourne Water

dd	mm	yy
25	5	22

Collector: J. S
Helper 1: D. I
Helper 2:

Site code: MRB-130320-2
Waterbody: MARYBRANONG

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. !MPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. **Length codes:** TL-Total length, LCF-Length to Caudal Fork. **Reproductive Condition:** E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	PHY CRA	1	52	TL	2				
2			" "	2	40	TL	1				
3		2	—			—					
4		3	—			—					
5		4	Paperch	1	282	TL	194	U			
6		4	GAL MAC	1	145	FL	22				
7		5	PHY CRA	3	39	TL	1				
8		5	ANG AUS	1	750	TL	—				
9		6	GAL MAC	2	83	FL	5				
10		6	GAL MAC	3	83	FL	5				
11		[illegible]	[illegible]		8	—					
12		6	PSE URV	2	275	TL	194				
13		7	ANG AUS	2	450	TL	—				
14		8	GAL MAC	4	87	FL	5				
15		8	ANG AUS	3	550	TL	—				
16		8	ANG AUS	4	600	TL	—				
17											
18											
19											
20											
21											
22											
23											
24											
25											

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FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
23 / 5 / 2022	D.I	YAR-42313-7	YARRA RIVER - UPPER
	Helper 1 S.S	Location description: UPPER YARRA @ GATE	
	Helper 2		

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. if there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.5	9.8	8.00	57.9	4.36	—	8.41	74.3

Bottom depth (m) 0.5 Date & Time of Sampling 23 / 5 / 22 0 : 9 : 00

Platypus
Seen ○
Not seen ⊗

Conditions

Waterbody		Weather	
Stream	⊗	Sunny	⊗
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	⊗
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	⊗
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37.673734
145.874181
Downstream
-37.674162
145.873549

Comments

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) 1 / 4

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 23 / 5 / 22

Collector: D. I
Helper 1: S. S
Helper 2:

Site code: YAR-42313-7
Waterbody: YARRA RIVER - UPPER

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	9:20:00	9:40:00	09:49:00	9:55:00	10:01:00	10:10:00	10:25:00	10:34:00	9:32:00	::
Time (24hr) End	9:36:00	9:45:00	9:54:00	10:01:00	10:08:00	10:18:00	10:30:00	10:40:00	11:10:00	::
Date (dd/mm/yy) Start	//	//	//	//	//	//	//	//	//	//
Date (dd/mm/yy) End	//	//	//	//	//	//	//	//	//	//
Method	BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / e'fish start (sec)	150	150	150	150	150	150	150	150		
mesh (mm) / end (sec)										
Volts	300	325	325	325	325	325	325	325		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	20	20	20	20	20	20	20	20		
amps	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
BLACK FISH	2	(1)		1	0	3 (1)	1 (2)	0	0	
B. TROUT		(1)	1 1	1 (1)		(1)	1			
S. CRAY			1	(1)			1			

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MW.F.RS.2

Biological page # (e.g. 1/5) 4 / 4

BIOLOGICAL RECORD Melbourne Water

dd	mm	yy
23	5	22

Collector: O. T.
Helper 1: J S
Helper 2:

Site code: YAR-4238-7.
Waterbody: YARRA RIVER.

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP.	1	BLACK FISH	1	380.	TL.					
2		1	BLACK FISH	2	215	TL	807.				
3		3	B. TROUT	1	120.	FL.	18.				
4		3	S. CRAY.	1	25.	.	5				
5		4	B. FISH.	3	230	TL	119.				
6		4	B. TROUT	2	92	FL	11.				
7		6	B. FISH	4	193	TL	66.				
8		6	" "	5	102	TL	11				
9		6	" "	6.	105	TL.	11.				
10		7	" "	7	91	TL.	10.				
11		7	S. CRAY	2.	13.						
12	BT.		NO FISH.								
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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MW.F.RS.4

Habitat page # (e.g. 1/3) 2 / 4

HABITAT RECORD Melbourne Water

dd mm yy: 23 / 5 / 22

Collector: D. I
Helper 1: J. S
Helper 2:

Site code: YAR-42313-7
Waterbody: YARRA RIVER.

Instructions

Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	●	●	Bedrock	○	●	●	○	○	Bedrock
Boulder (>120 mm)	●	●	●	○	○	Boulder (>120 mm)	●	●	●	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	●	●	●	●	●	Cobble (60-200 mm)	●	●	●	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	●	●	●	●	●	Gravel (2-60 mm)	●	●	●	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	●	●	●	●	●	Sand (0.6-2 mm)	●	●	●	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	●	●	●	Native trees	●	●	●	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	●	●	●	●	●	Native shrubs	●	●	●	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	●	●	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	○	○	○	○	○	Emergent macrophytes	○	○	○	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	○	○	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	○	○	○	○	○	Biofilms	○	○	○	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	●	●	●	●	●	Rock	●	●	●	○	○	Rock
Timber	●	●	●	●	●	Timber	●	●	●	○	○	Timber
Undercuts	●	●	○	●	○	Undercuts	●	●	○	○	○	Undercuts
Leaf litter	●	●	●	●	●	Leaf litter	●	○	●	○	○	Leaf litter
Macrophytes	○	○	○	○	○	Macrophytes	○	○	○	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	○	○	○	○	○	Pools	○	●	○	○	○	Pools
Run	●	●	●	●	●	Run	●	●	●	○	○	Run
Riffle	○	●	○	○	○	Riffle	○	○	●	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	●	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	M	M	M	S	S	Velocity (F, M, S, NF)	M	M	M			Velocity (F, M, S, NF)
Average wetted width (m)	5.5	5.5	6.0	7.0	7.0	Average wetted width (m)	7.0	7.0	5.0			Average width (m)
Average depth (m)	0.9	0.8	0.4	0.4	0.4	Average depth (m)	0.7	0.8	0.5			Average depth (m)
Distance travelled (m)	30	30	30	30	30	Distance travelled (m)	30	30	30			Distance travelled (m)

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MW.F.RS.5

Site map page # (e.g. 1/2) 3 / 4

SITE MAP Melbourne Water

dd mm yy	Drawer	Site code	Instructions
23 / 5 / 22	D I	YAR-42313-7	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody YARRA RIVER	

Comments:

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) 1 / 4 **EFFORT AND CATCH RECORD** Melbourne Water

dd mm yy	Collector	Site code	Gear codes
25 / 5 / 22	Collector: SJ.S	Site code: MRB-130320-2	Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
	Helper 1: D.T	Waterbody: MARIBYRNONG	Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net
	Helper 2:		

Operation #		1	2	3	4	5	6	7	8	9	10
Time (24hr)	Start	11:15:03	11:22:	11:26:	11:29:	11:35:	11:40:	11:50:	11:57:	11:00	: :
	End	11:20:00	11:25:	11:29:	11:34:	11:39:	11:45:	11:55:	12:03	12:15:	: :
Date (dd/mm/yy)	Start	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
	End	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
	Method	BP.	→	→	→	→	→	→	BP	BT	
nets length (m) / e'fish start (sec)											
mesh (mm) / end (sec)											
	Volts	150.									
	pulses per sec	50.									
	% duty cycle (range)	20.									
	amps	4.1									

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
PHY GRA	2.				1					
GAL MAC	(1)			2		2		1	NO	
TUPONC				1		1			FISH	
ANG AUS					1 ^750		1 ~450	2 ~550 ~600		

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MW.F.RS.2

Biological page # (e.g. 1/5) 1/1 · **BIOLOGICAL RECORD** Melbourne Water

dd	mm	yy
25	5	22

Collector: J. S
Helper 1: D. I
Helper 2:

Site code: MRB-130320-2
Waterbody: MARYBANONG

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	PHY CRA	1	52	TL	2				
2			" "	2	40	TL	1				
3		2	—			—					
4		3	—			—					
5		4	PaPonc	1	282	TL	194	U			
6		4	GAL MAC	1	145	FL	22				
7		5	PHY CRA	3	39	TL	1				
8		5	ANG ANG	1	750	TL	—				
9		6	GAL MAC	2	83	FL	5				
10		6	GAL MAC	3	83	FL	5				
11		[redacted]			8	—					
12		6	PSE URV	2	275	TL	194				
13		7	ANG AUS	2	450	TL	—				
14		8	GAL MAC	4	87	FL	5				
15		8	ANG AUS	3	550	TL	—				
16		8	ANG AUS	4	600	TL	—				
17											
18											
19											
20											
21											
22											
23											
24											
25											

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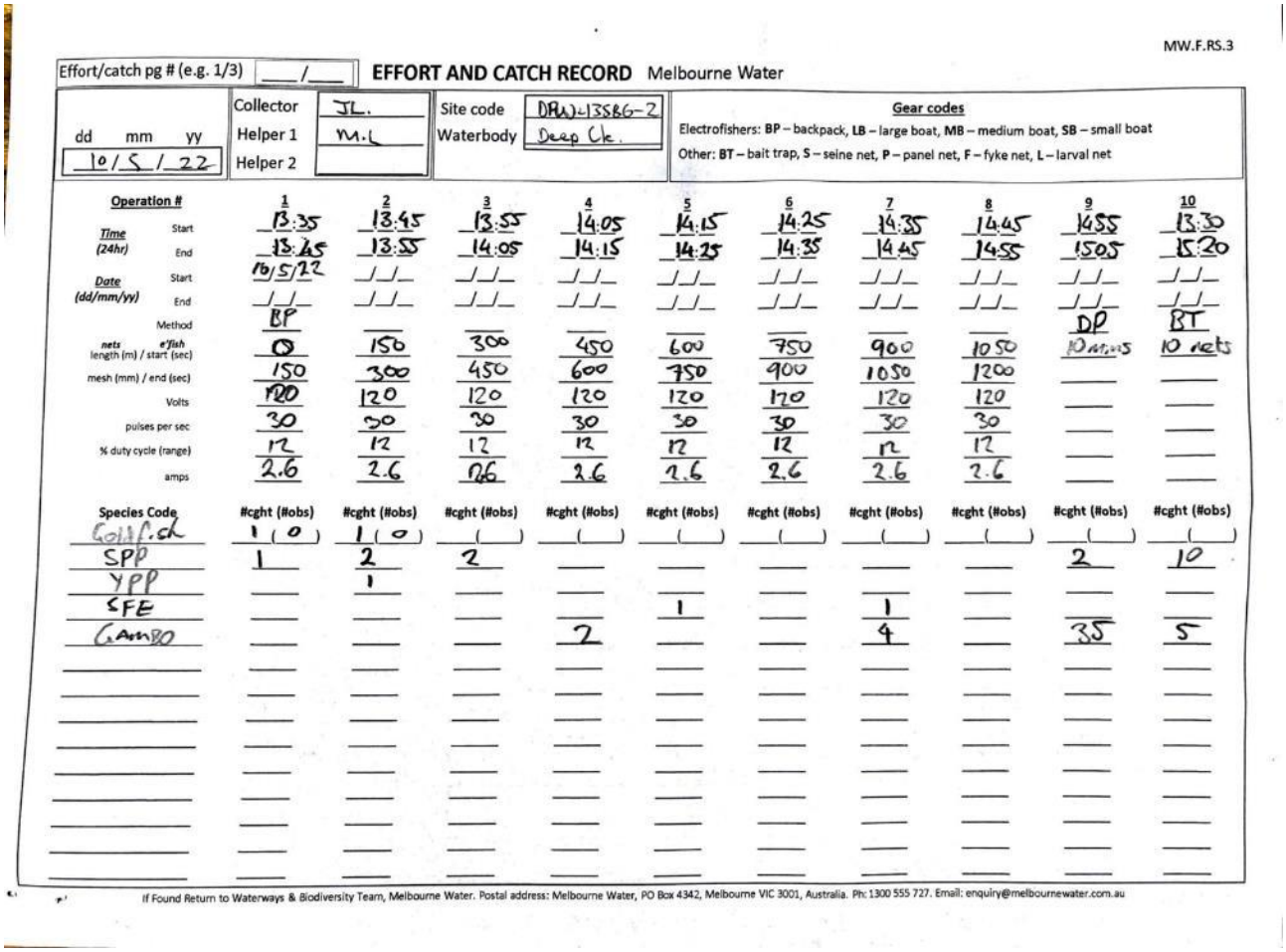

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 10/5/22

Collector: JL.
Helper 1: M.L
Helper 2:

Site code: DRW-13586-2
Waterbody: Deep Ck.

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	13:35	13:45	13:55	14:05	14:15	14:25	14:35	14:45	14:55	13:30
Time (24hr) End	13:45	13:55	14:05	14:15	14:25	14:35	14:45	14:55	15:05	15:20
Date (dd/mm/yy) Start	10/5/22	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__
Date (dd/mm/yy) End	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__
Method	BP								DP	BT
nets length (m) / e'fish start (sec)	0	150	300	450	600	750	900	1050	10 mins	10 nets
mesh (mm) / end (sec)	150	300	450	600	750	900	1050	1200		
Volts	120	120	120	120	120	120	120	120		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	12	12	12	12	12	12	12	12		
amps	2.6	2.6	0.6	2.6	2.6	2.6	2.6	2.6		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
Gold f.ck	1 (0)	1 (0)	(__)	(__)	(__)	(__)	(__)	(__)	(__)	(__)
SPP	1	2	2						2	10
YPP		1								
SFE					1		1			
GAMBO				2			4		35	5

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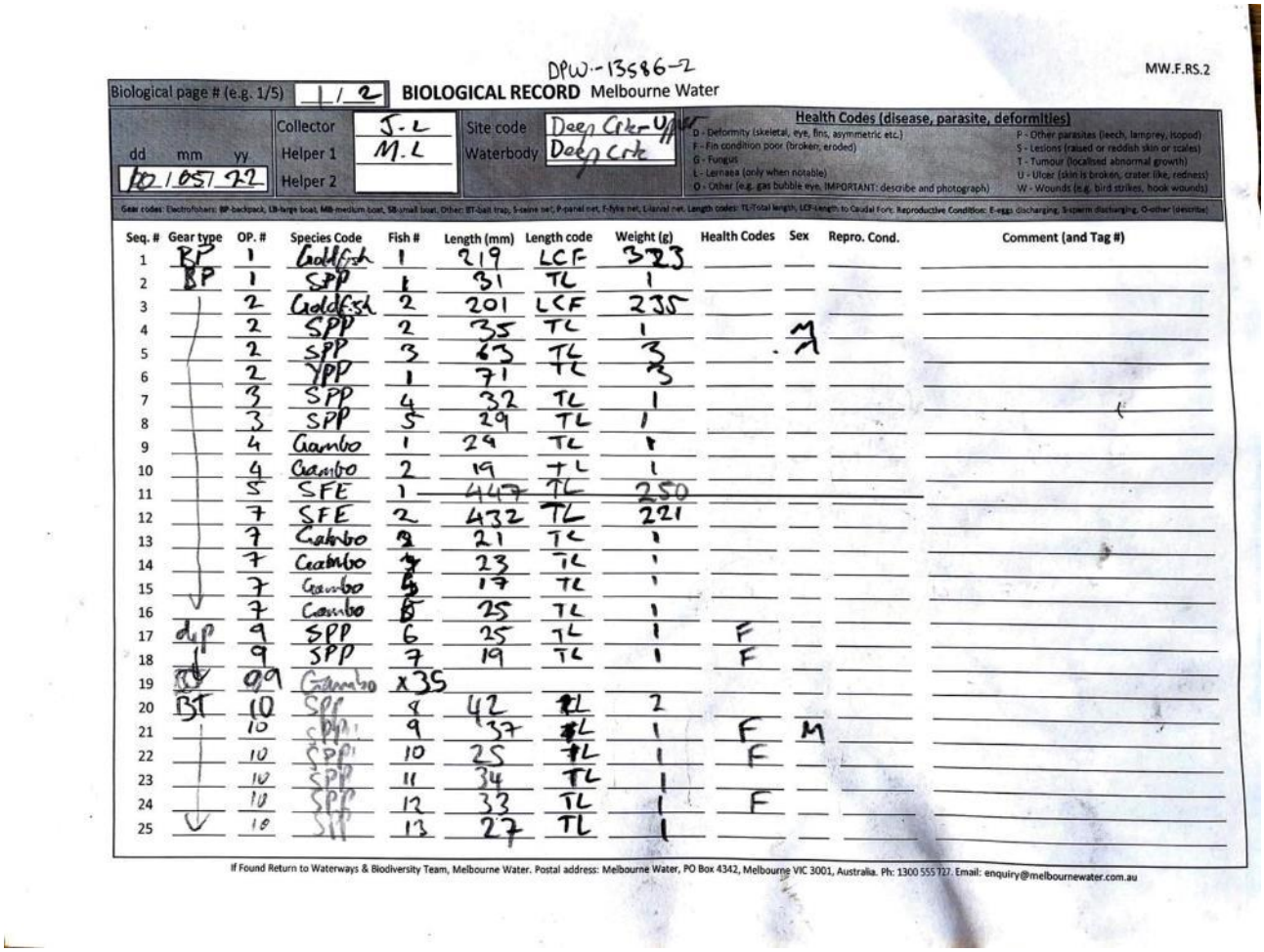

DPW-13586-2

MW.F.RS.2

Biological page # (e.g. 1/5) 1 / 2 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 10 / 05 / 22

Collector: J.L
Helper 1: M.L
Helper 2:

Site code: Deep Ck br U/S
Waterbody: Deep Crk

Health Codes (disease, parasite, deformities)
D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Larnaea (only when notable)
O - Other (e.g. gas bubble eye, IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat, Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	Goldfish	1	219	LCF	323				
2	BP	1	SPP	1	31	TL	1				
3		2	Goldfish	2	201	LCF	235				
4		2	SPP	2	35	TL	1		M		
5		2	SPP	3	63	TL	3		M		
6		2	SPP	1	71	TL	3				
7		3	SPP	4	32	TL	1				
8		3	SPP	5	29	TL	1				
9		4	Gambo	1	29	TL	1				
10		4	Gambo	2	19	TL	1				
11		5	SFE	1	447	TL	250				
12		7	SFE	2	432	TL	221				
13		7	Gambo	3	21	TL	1				
14		7	Gambo	4	23	TL	1				
15		7	Gambo	5	17	TL	1				
16		7	Gambo	6	25	TL	1				
17	dup	9	SPP	6	25	TL	1	F			
18		9	SPP	7	19	TL	1	F			
19	BT	09	Gambo	x35							
20	BT	10	SPP	8	42	TL	2				
21		10	SPP	9	37	TL	1	F	M		
22		10	SPP	10	25	TL	1	F			
23		10	SPP	11	34	TL	1				
24		10	SPP	12	33	TL	1	F			
25		10	SPP	13	27	TL	1				

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DPW-13586-2

MW.F.RS.2

Biological page # (e.g. 1/5) 2 / 2 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 10 / 5 / 22

Collector: JL
Helper 1: ML
Helper 2:

Site code: DeepCk Upper
Waterbody: Deep Ck

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BT	10	SPP	14	23	TL	1	F			
2	↓	10	SPP	15	26	TL	1		M		
3	↓	10	SPP	16	31	TL	1	F			
4	↓	10	SPP	17	24	TL	1	F			
5	↓	10	Gambo	7	23	TL	1				
6	↓	10	Gambo	8	26	TL	1				
7	↓	10	Gambo	9	18	TL	1				
8	↓	10	Gambo	10	19	TL	1				
9	↓	10	Gambo	11	24	TL	1				
10											
11											
12											
13											
14											
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16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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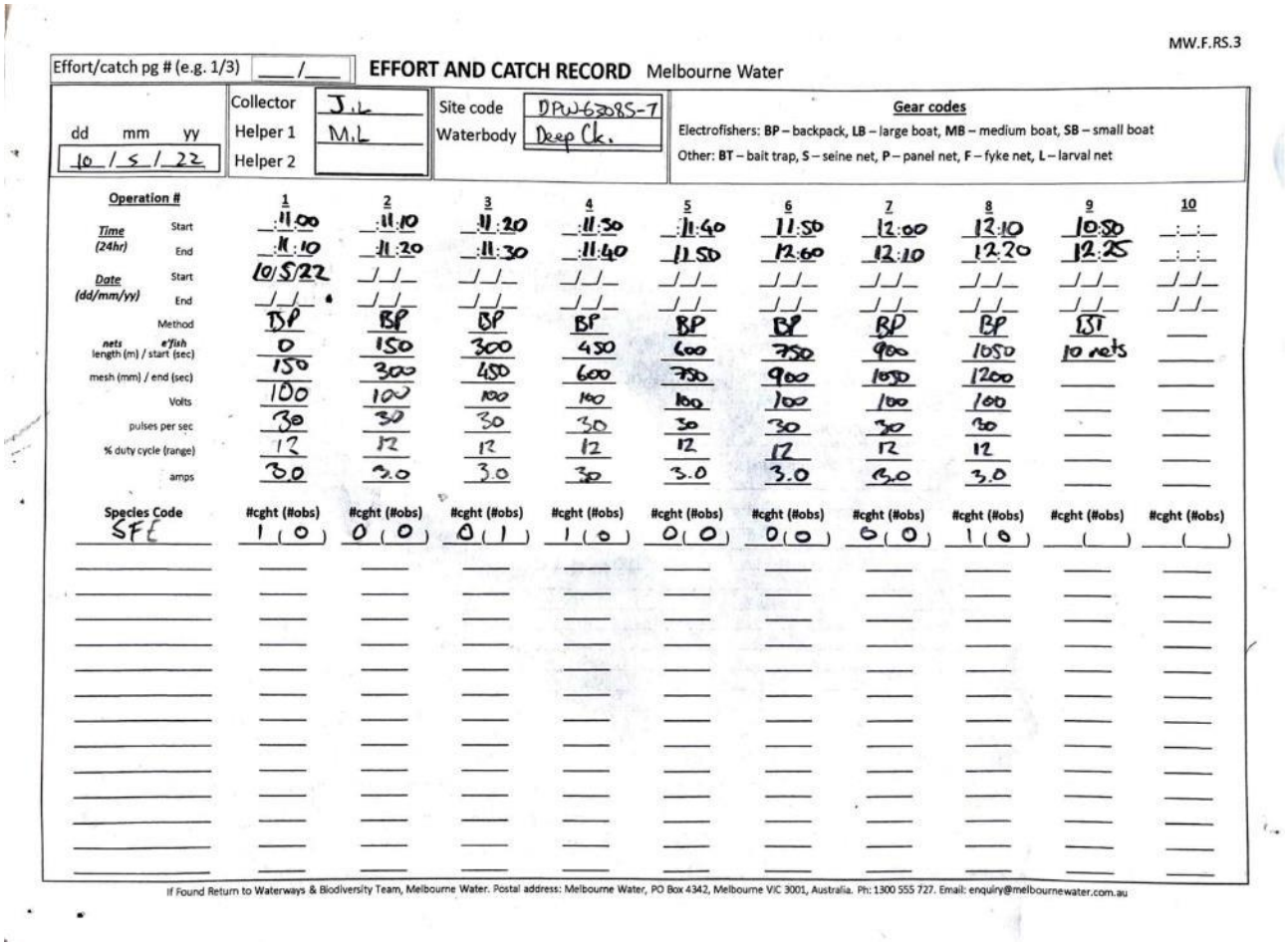

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 10 / 5 / 22

Collector: J.L
Helper 1: M.L
Helper 2:

Site code: DPW-6308S-7
Waterbody: Deep Ck.

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	11:00	11:10	11:20	11:30	11:40	11:50	12:00	12:10	10:50	::
Time (24hr) End	11:10	11:20	11:30	11:40	11:50	12:00	12:10	12:20	12:25	::
Date (dd/mm/yy) Start	10/5/22	//	//	//	//	//	//	//	//	//
Date (dd/mm/yy) End	//	//	//	//	//	//	//	//	//	//
Method	BP	BP	BP	BP	BP	BP	BP	BP	IST	
nets length (m) / e-fish start (sec)	0	150	300	450	600	750	900	1050	10 nets	
mesh (mm) / end (sec)	150	300	450	600	750	900	1050	1200		
Volts	100	100	100	100	100	100	100	100		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	12	12	12	12	12	12	12	12		
amps	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Species Code	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**	**#cght (#obs)**
SFE	1 (0)	0 (0)	0 (1)	1 (0)	0 (0)	0 (0)	0 (0)	1 (0)	( )	( )

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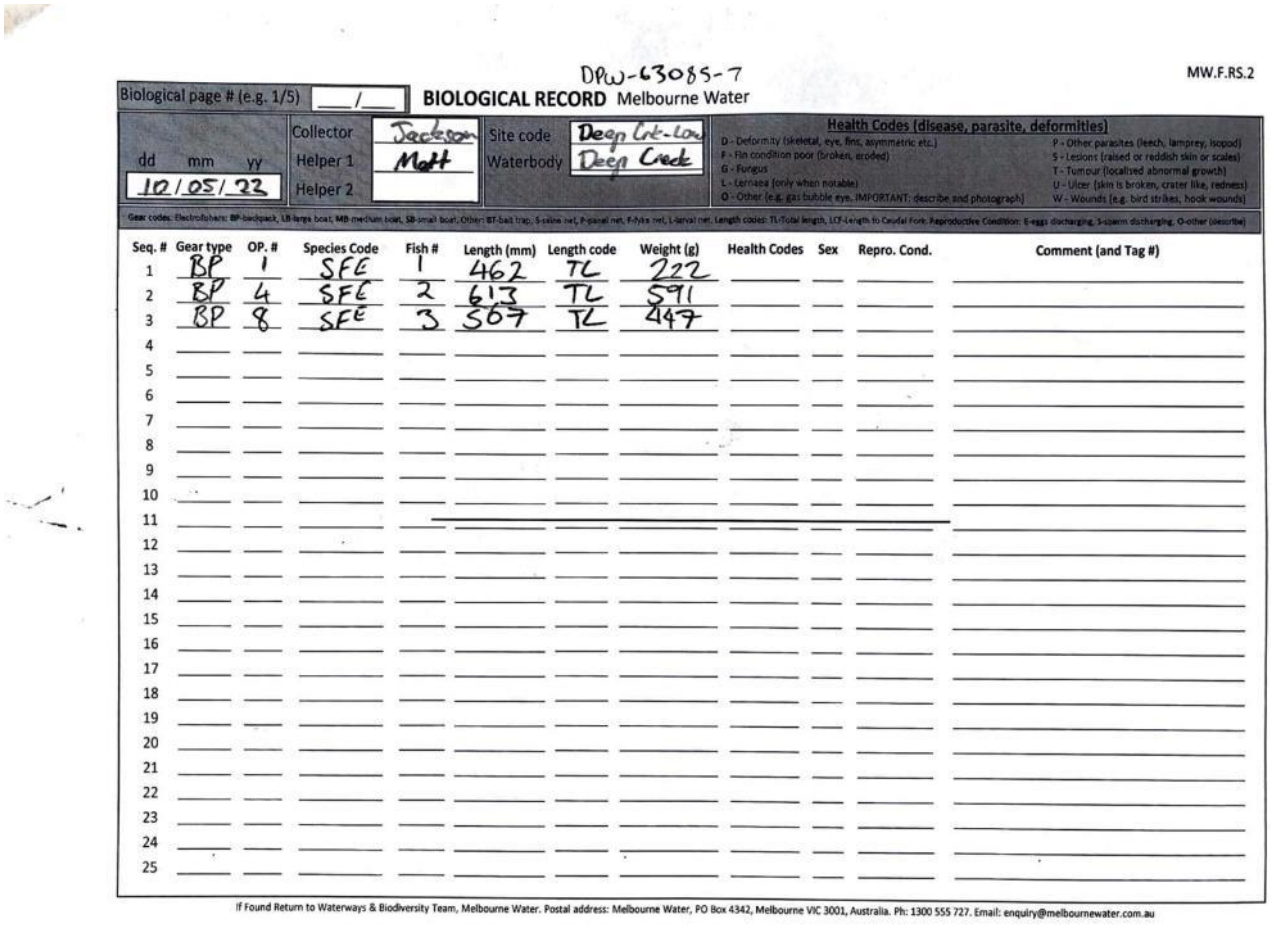

DPW-63085-7

MW.F.RS.2

Biological page # (e.g. 1/5) ___/___ **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 10/05/22

Collector: Jackson
Helper 1: Matt
Helper 2:

Site code: Deep Crk-Low
Waterbody: Deep Creek

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye, IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat; Others: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	SFE	1	462	TL	222				
2	BP	4	SFE	2	613	TL	591				
3	BP	8	SFE	3	567	TL	447				
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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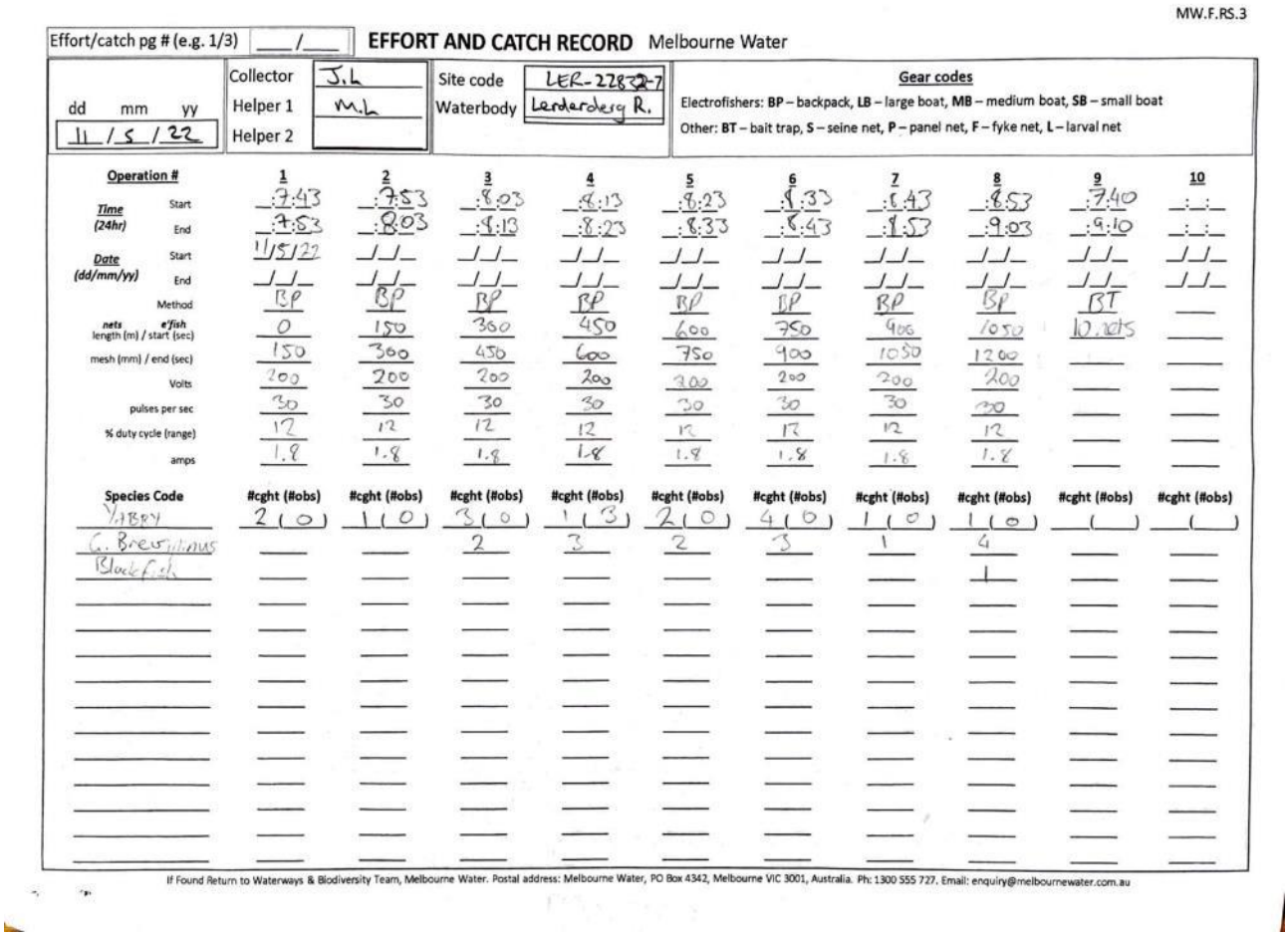

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___ **EFFORT AND CATCH RECORD** Melbourne Water

dd mm yy: 11 / 5 / 22

Collector: J.L
Helper 1: M.L
Helper 2:

Site code: LER-22832-7
Waterbody: Lerderderg R.

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	7:43	7:53	8:03	8:13	8:23	8:33	8:43	8:53	7:40	:
Time (24hr) End	7:53	8:03	8:13	8:23	8:33	8:43	8:53	9:03	9:10	:
Date (dd/mm/yy) Start	11/5/22	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Date (dd/mm/yy) End	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Method	BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / e'fish start (sec)	0	150	300	450	600	750	900	1050	10.10TS	
mesh (mm) / end (sec)	150	300	450	600	750	900	1050	1200		
Volts	200	200	200	200	200	200	200	200		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	12	12	12	12	12	12	12	12		
amps	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
Y/FBDY	2 (0)	1 (0)	3 (0)	1 (3)	2 (0)	4 (0)	1 (0)	1 (0)	( )	( )
G. Brevipinnis			2	3	2	3	1	4		
Blackfish								1		

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MW.F.RS.2

LER-22832-7

Biological page # (e.g. 1/5) 1 / 2 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 11 / 5 / 2021

Collector: J.L
Helper 1: ML
Helper 2:

Site code: Lerderderg G
Waterbody: Lerderderg R.

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	YABBY	1	70	TL	8		F		
2		1	YABBY	2	35		2				
3		2	YAB	3	100		31		M		
4		3	YAB	4	65		8		F		
5		3	YAB	5	81		17		F		
6		3	YAB	6	59		7		M		
7		3	Brev	1	69		3				
8		3	Brev	2	55		2	P			(Parasite) small white dot
9		4	YAB	7	34		0.5				
10		4	Brev	3	52		1				Brev = G.ornatus (James Shelley)
11		4	Brev	4	~~60~~		~~2~~				
12		4	Brev	5	54		1	P			(Parasite) Small white dot
13		5	YAB	8	64		7		M		
14		5	YAB	9	33		2				
15		5	Brev	6	56		2				
16		5	Brev	7	52		2				
17		6	YAB	10	33		1				
18		6	YAB	11	44		2				
19		6	YAB	12	28		0.5				
20		6	YAB	13	32		1				
21		6	Brev	8	59		2	P			Parasite As above
22		6	Brev	9	60		2				
23		6	Brev	10	66		2	P			''
24		7	YAB	14							
25		7	Brev	11	51		1	P			''

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MW.F.RS.2

Biological page # (e.g. 1/5) ___/___

BIOLOGICAL RECORD Melbourne Water

dd mm yy	Collector	Site code	Waterbody
11 / 5 / 22	Helper 1: M.L	LER-22832-7	Lerderderg R
	Helper 2:		

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	8	YAB	15		TL					
2		8	Brev	12	56	"	1	P			White spots under skin
3		8	Brev	13	57	"	1	P			"
4		8	Brev	14	55	"	1				
5		8	Brev	15	62	"	1	P			"
6		8	Blackfish	1	~~332~~ 320	TL	245				
7		8	Brev	16	57	"	1	P			"
8	BT	9	Brev	17	54	"	1				
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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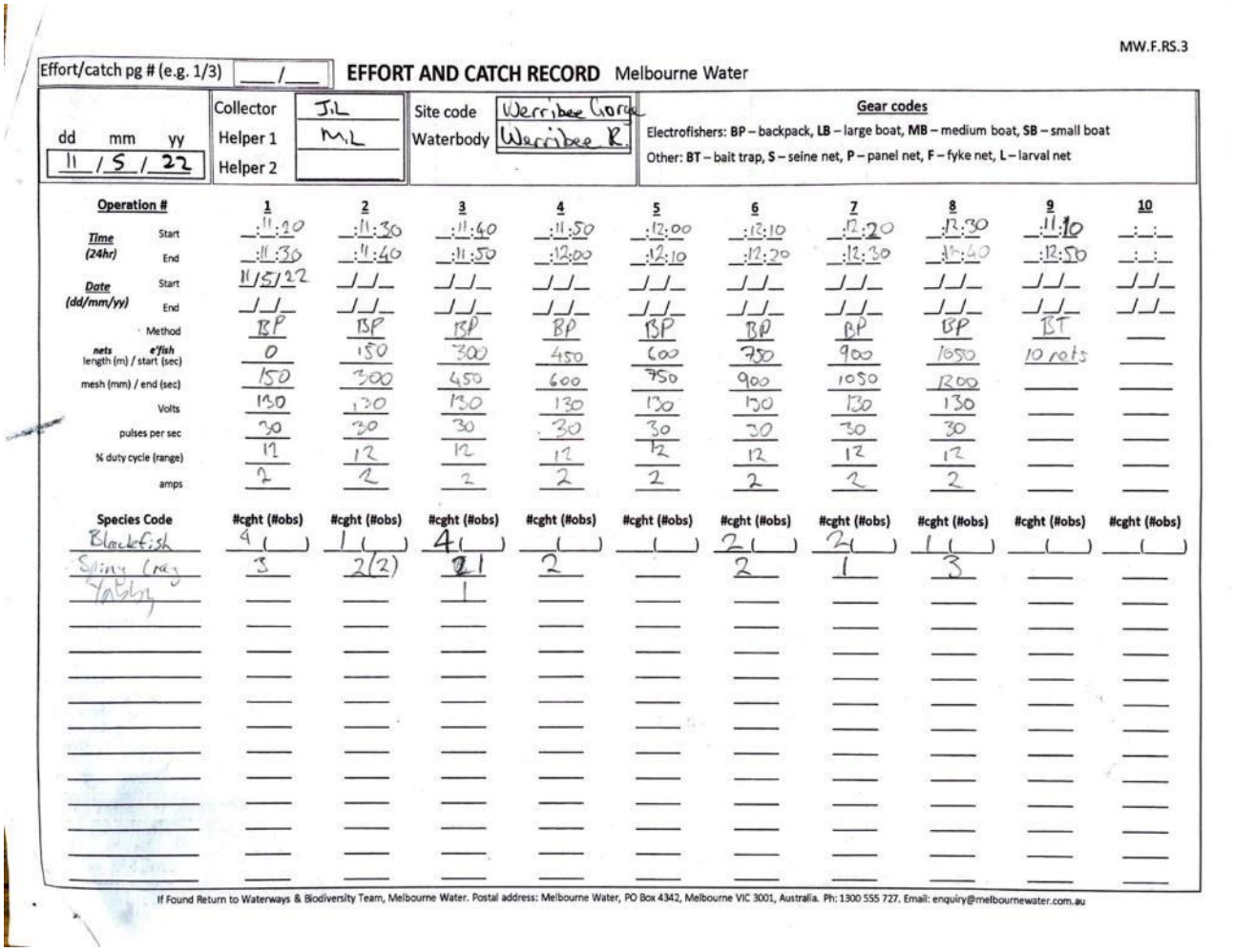

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 11 / 5 / 22

Collector: J.L
Helper 1: M.L
Helper 2:

Site code: Werribee Gorge
Waterbody: Werribee R.

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	:11:20	:11:30	:11:40	:11:50	:12:00	:12:10	:12:20	:12:30	:11:10	::
Time (24hr) End	:11:30	:11:40	:11:50	:12:00	:12:10	:12:20	:12:30	:12:40	:12:50	::
Date (dd/mm/yy) Start	11/5/22	//	//	//	//	//	//	//	//	//
Date (dd/mm/yy) End	//	//	//	//	//	//	//	//	//	//
Method	BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / start (sec)	0	150	300	450	600	750	900	1050	10 nets	
e-fish mesh (mm) / end (sec)	150	300	450	600	750	900	1050	1200		
Volts	130	130	130	130	130	130	130	130		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	17	12	12	17	12	12	12	12		
amps	2	2	2	2	2	2	2	2		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
Blackfish	4 ( )	1 ( )	4 ( )	( )	( )	2 ( )	2 ( )	1 ( )	( )	( )
Spiny Crayfish	3	2(2)	21	2		2	1	3		
			1							

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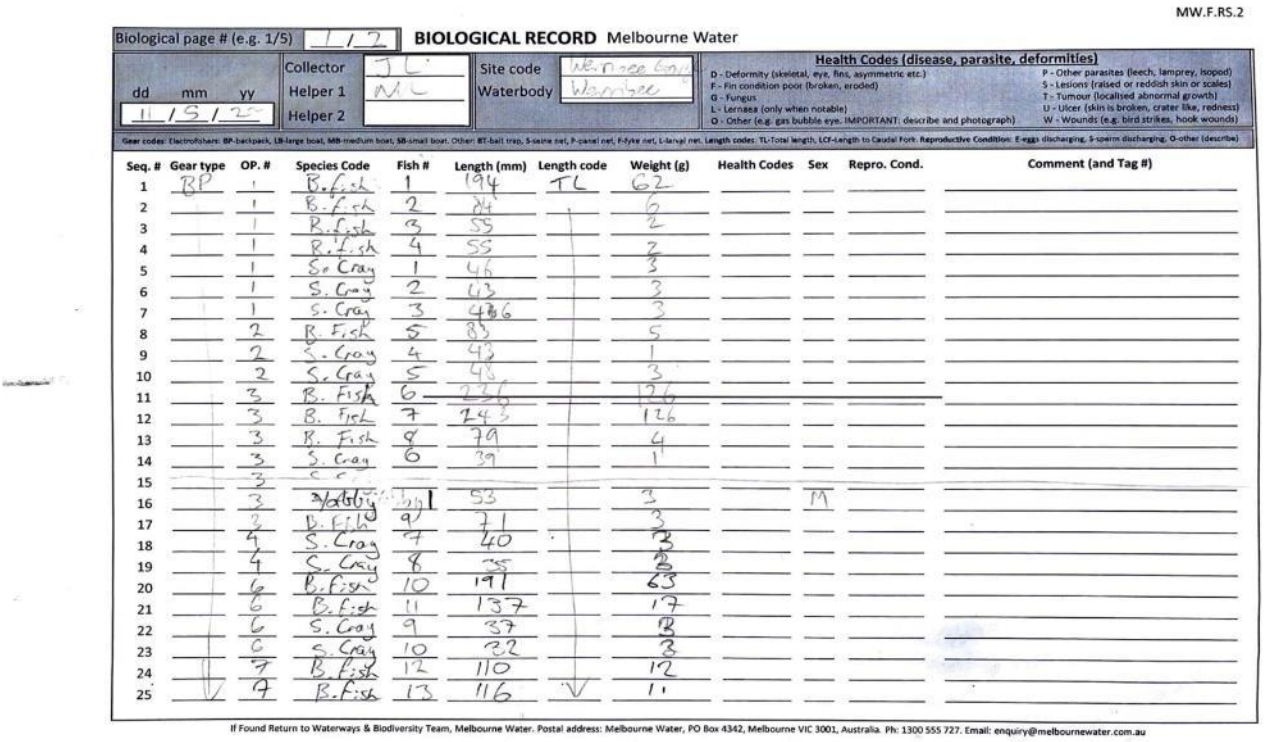

MW.F.RS.2

Biological page # (e.g. 1/5) 1/2

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 11/5/22

Collector: JL

Helper 1: NL

Helper 2:

Site code: Werribee Conf

Waterbody: Werribee

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	B. Fish	1	194	TL	62				
2		1	B. Fish	2	94		6				
3		1	B. Fish	3	55		2				
4		1	B. Fish	4	55		2				
5		1	So Cray	1	46		3				
6		1	S. Cray	2	43		3				
7		1	S. Cray	3	46		3				
8		2	B. Fish	5	83		5				
9		2	S. Cray	4	43		1				
10		2	S. Cray	5	46		3				
11		3	B. Fish	6	226		126				
12		3	B. Fish	7	243		126				
13		3	B. Fish	8	79		4				
14		3	S. Cray	6	39		1				
15		3	c r								
16		3	Yabby	1	53		2		M		
17		3	B. Fish	9	71		3				
18		4	S. Cray	7	40		2				
19		4	S. Cray	8	55		3				
20		6	B. Fish	10	191		63				
21		6	B. Fish	11	137		17				
22		6	S. Cray	9	37		2				
23		6	S. Cray	10	32		3				
24		7	B. Fish	12	110		12				
25	V	7	B. Fish	13	116	V	11				

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MW.F.RS.2

Biological page # (e.g. 1/5) 2/2 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy ___/___/___

Collector JC
Helper 1 ML
Helper 2

Site code
Waterbody

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fin, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	7	S. Gray	11	34	TL	3				
2	"	8	S. Gray	12	42	"	3				
3	"	8	S. Gray	13	45	"	3				
4	"	8	S. Gray	14	36	"	3				
5	"	8	B. Fish	14	59	"	1				
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) 1 / 1 **EFFORT AND CATCH RECORD** Melbourne Water

dd mm yy	Collector	D. I	Site code	WER-138058-6	**Gear codes**
25 / 5 / 22	Helper 1	J.S.	Waterbody	WERRIBEE	Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
	Helper 2				Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	1341	13:48	14:00	14:06	14:13	14:13	14:19	14:26	13:30	_:_
End	1347	13:54	14:05	14:12	14:17	14:18	14:25	14:32	14:40	_:_
Date (dd/mm/yy) Start	25 5/22	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_
End	25 5/22	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_
Method	EF									
nets length (m) / e'fish start (sec)	0									
mesh (mm) / end (sec)	150	ALL SAME FOR EF								
Volts	120									
pulses per sec										
% duty cycle (range)	20									
amps	3									
Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
	( )	( )	( )	( )	0 (0)	( )	( )	( )	( )	( )
GAL MAC	20(0)	15(9)	10(8)	9(12)		1(0)	3(0)		3(0)	
PHI GRA	2(0)	1	1	0(1)					3(0)	
GAM HOL	2(0)	5								
ANG AUS	250 1(0	300 1	3(0)	350 1(0)		150 430 5(0) 300 400	250 350 4(0) 300 250			
Tupong						0(1)	1(0)	1(0)		

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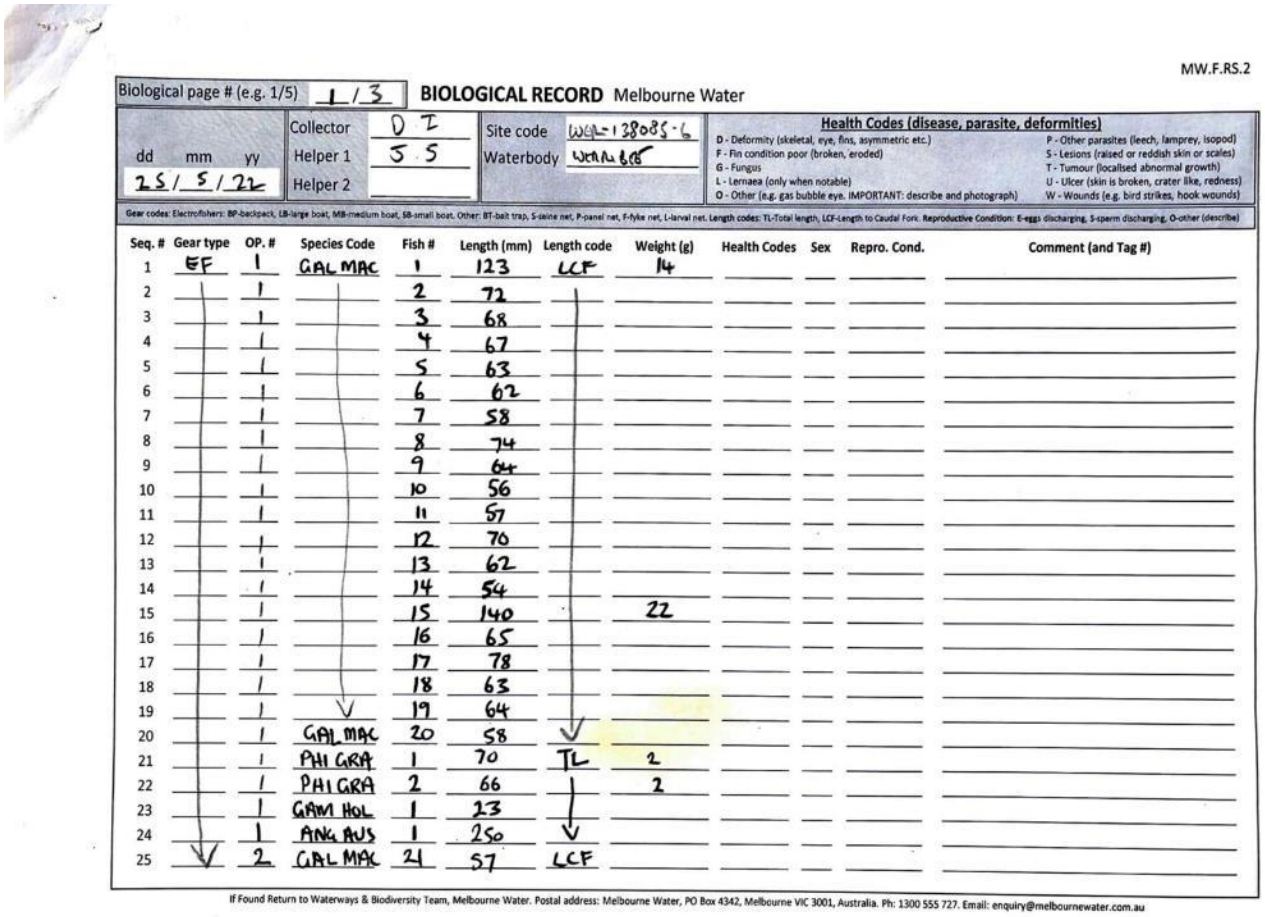

MW.F.RS.2

Biological page # (e.g. 1/5) 1/3

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 25/5/22

Collector: DT
Helper 1: SS
Helper 2:

Site code: WGL-138085-6
Waterbody: WERRIBEE

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	EF	1	GAL MAC	1	123	LCF	14				
2	"	1	"	2	72	"					
3	"	1	"	3	68	"					
4	"	1	"	4	67	"					
5	"	1	"	5	63	"					
6	"	1	"	6	62	"					
7	"	1	"	7	58	"					
8	"	1	"	8	74	"					
9	"	1	"	9	64	"					
10	"	1	"	10	56	"					
11	"	1	"	11	57	"					
12	"	1	"	12	70	"					
13	"	1	"	13	62	"					
14	"	1	"	14	54	"					
15	"	1	"	15	140	"	22				
16	"	1	"	16	65	"					
17	"	1	"	17	78	"					
18	"	1	"	18	63	"					
19	"	1	"	19	64	"					
20	"	1	GAL MAC	20	58	"					
21	"	1	PHI GRA	1	70	TL	2				
22	"	1	PHI GRA	2	66	"	2				
23	"	1	GAM HOL	1	23	"					
24	"	1	ANG AUS	1	250	"					
25	"	2	GAL MAC	21	57	LCF					

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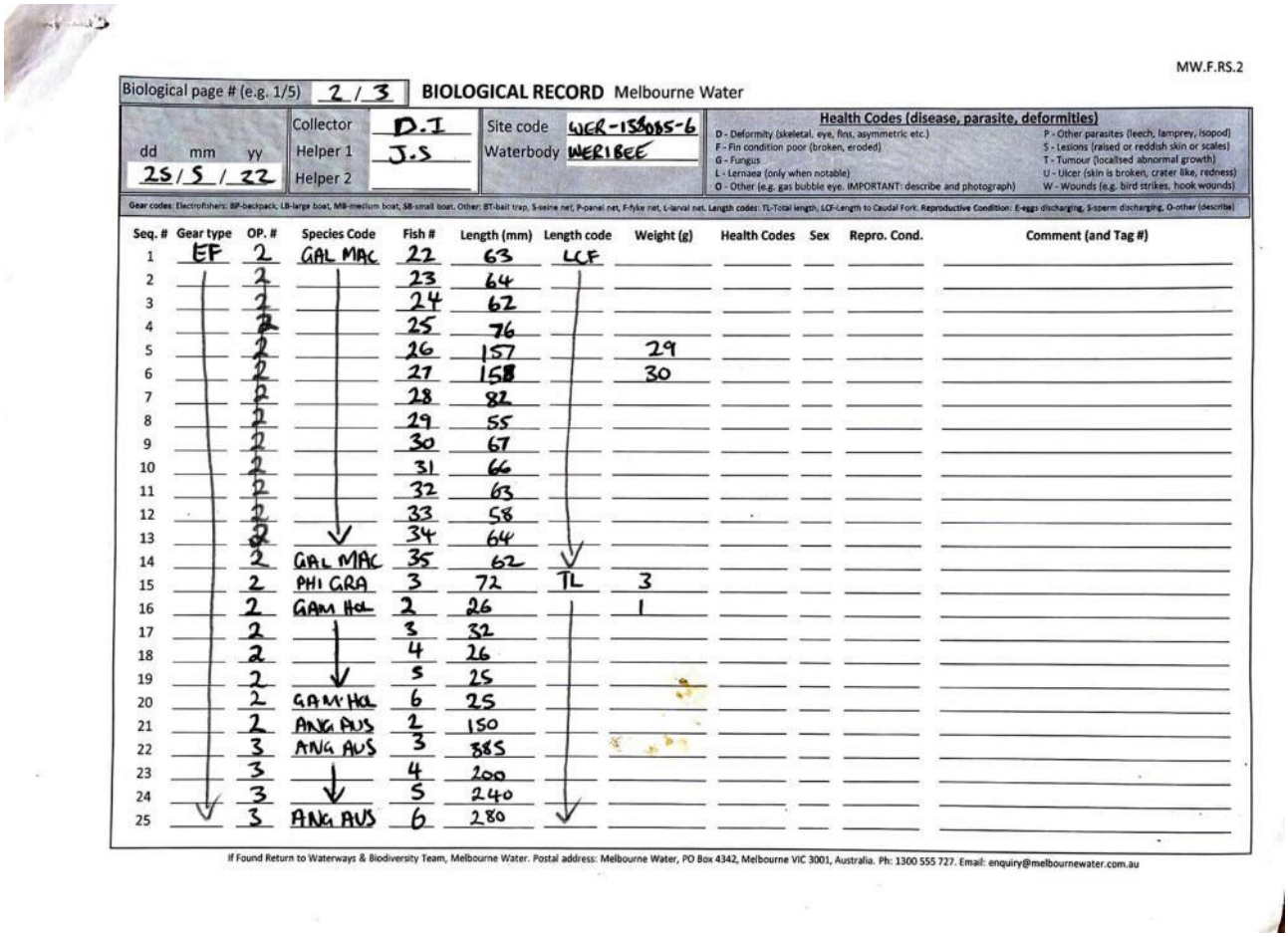

MW.F.RS.2

Biological page # (e.g. 1/5) 2 / 3 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 25 / 5 / 22

Collector: D.I
Helper 1: J.S
Helper 2:

Site code: WER-155085-6
Waterbody: WERIBEE

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	EF	2	GAL MAC	22	63	LCF					
2		2		23	64						
3		2		24	62						
4		2		25	76						
5		2		26	157		29				
6		2		27	158		30				
7		2		28	82						
8		2		29	55						
9		2		30	67						
10		2		31	66						
11		2		32	63						
12		2		33	58						
13		2	↓	34	64						
14		2	GAL MAC	35	62	↓					
15		2	PHI GRA	3	72	TL	3				
16		2	GAM HOL	2	26		1				
17		2		3	32						
18		2		4	26						
19		2	↓	5	25						
20		2	GAM HOL	6	25						
21		2	ANG AUS	2	150						
22		3	ANG AUS	3	385						
23		3	↓	4	200						
24		3	↓	5	240						
25	↓	3	ANG AUS	6	280	↓					

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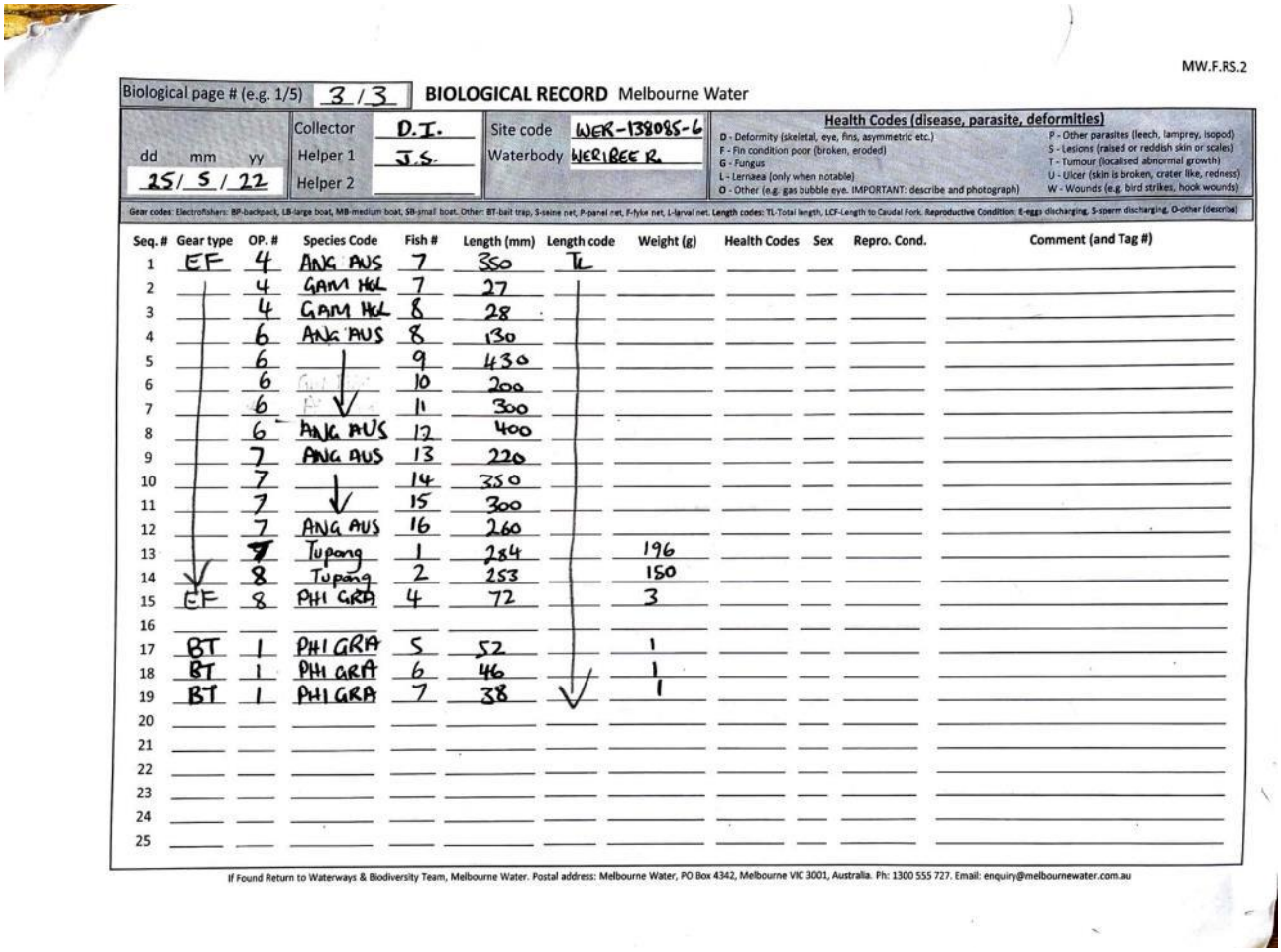

MW.F.RS.2

Biological page # (e.g. 1/5) 3/3 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 25/5/22

Collector: D.I.
Helper 1: J.S.
Helper 2:

Site code: WER-138085-6
Waterbody: WERIBEE R.

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	EF	4	ANG AUS	7	350	TL					
2		4	GAM HOL	7	27						
3		4	GAM HOL	8	28						
4		6	ANG AUS	8	130						
5		6		9	430						
6		6		10	200						
7		6		11	300						
8		6	ANG AUS	12	400						
9		7	ANG AUS	13	220						
10		7		14	350						
11		7		15	300						
12		7	ANG AUS	16	260						
13		7	Tupong	1	284		196				
14		8	Tupong	2	253		150				
15	EF	8	PHI GRA	4	72		3				
16											
17	BT	1	PHI GRA	5	52		1				
18	BT	1	PHI GRA	6	46		1				
19	BT	1	PHI GRA	7	38		1				
20											
21											
22											
23											
24											
25											

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WER-30289-9

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
11/05/22	S.L	Werribee Weir	Werribee River
	Helper 1 M.L	Location description: Downstream of Bacchus Marsh Weir	
	Helper 2		

Instructions and tips
IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet
*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record
*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet
*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record
* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	13.4	7.56	503	12.6	-	8.51	82.1

Bottom depth (m) _____ Date & Time of Sampling 11 / 5 / 22 : 16 : 05

Platypus
Seen ○
Not seen ⊗

Conditions

Waterbody		Weather	
Stream	✓	Sunny	○
Channel	○	Cloudy	✓
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	✓
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	✓
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates
Upstream
-37.679841
144.375309
Downstream
-37.679163
144.379223

Comments

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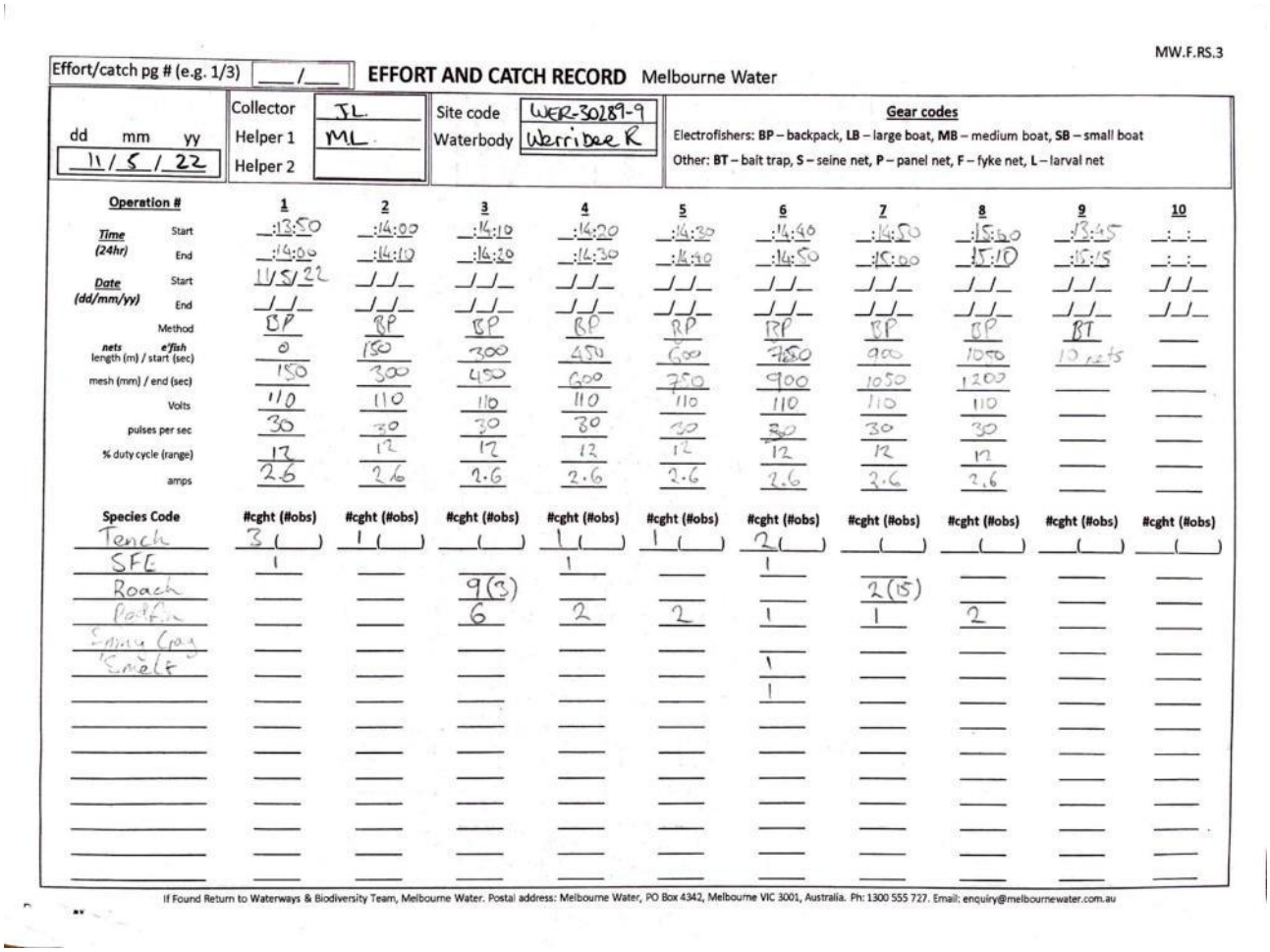

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___ **EFFORT AND CATCH RECORD** Melbourne Water

dd mm yy: 11/5/22

Collector: JL
Helper 1: ML
Helper 2:

Site code: WER-30289-9
Waterbody: Werribee R

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #		1	2	3	4	5	6	7	8	9	10
Time (24hr)	Start	:13:50	:14:00	:14:10	:14:20	:14:30	:14:40	:14:50	:15:00	:15:45	:_:_
	End	:14:00	:14:10	:14:20	:14:30	:14:40	:14:50	:15:00	:15:10	:15:15	:_:_
Date (dd/mm/yy)	Start	11/5/22	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_
	End	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_
Method		BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / e'fish start (sec)		0	150	300	450	600	750	900	1050	10 nets	
mesh (mm) / end (sec)		150	300	450	600	750	900	1050	1200		
Volts		110	110	110	110	110	110	110	110		
pulses per sec		30	30	30	30	30	30	30	30		
% duty cycle (range)		12	12	12	12	12	12	12	12		
amps		2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
Tench	3 (_)	1 (_)	_(_)	1 (_)	1 (_)	2 (_)	_(_)	_(_)	_(_)	_(_)
SFE	1			1		1				
Roach			9(3)				2(15)			
Perch			6	2	2	1	1	2		
Common Carp										
Smelt						1				
						1				

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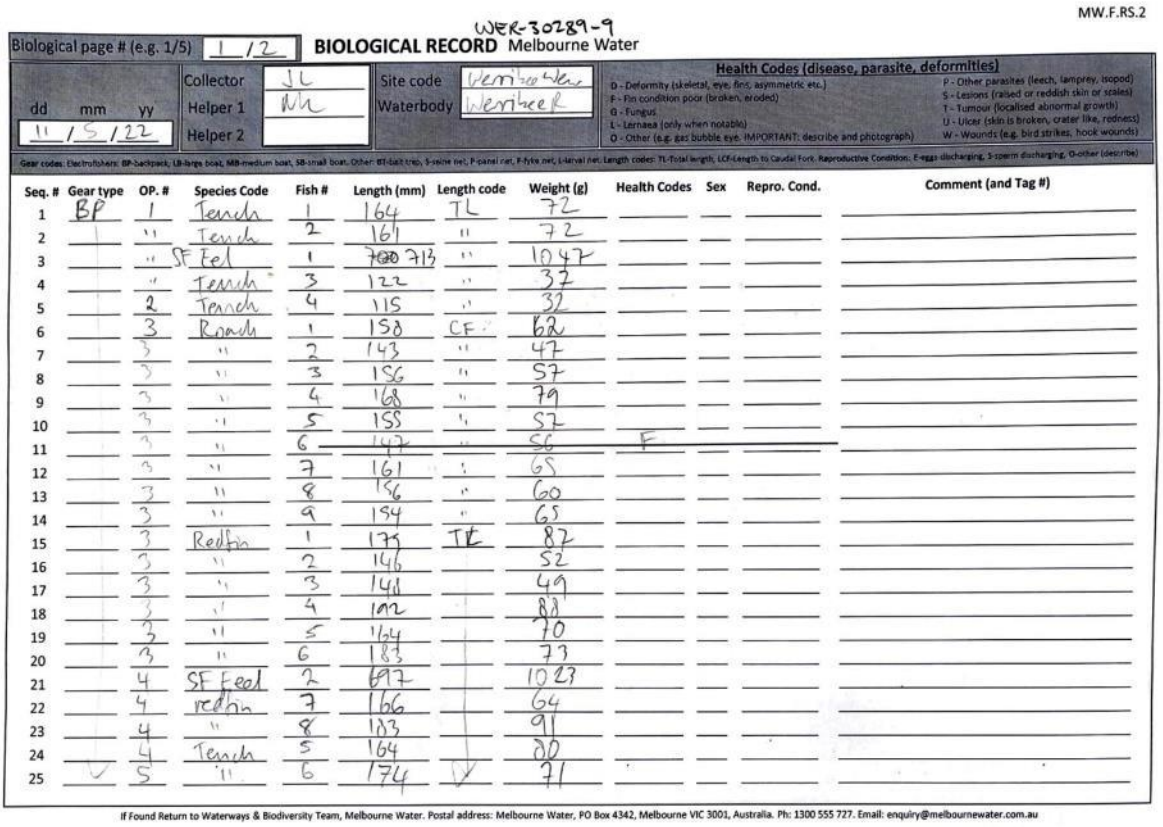

MW.F.RS.2

WER-30289-9

Biological page # (e.g. 1/5) 1/2 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 11/5/22 | Collector: JL | Helper 1: MM | Helper 2: | Site code: Werribee River | Waterbody: Werribee R

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	Tench	1	164	TL	72				
2	"	"	Tench	2	161	"	72				
3	"	SF Eel		1	~~720~~ 713	"	1047				
4	"	"	Tench	3	122	"	37				
5	"	2	Tench	4	115	"	32				
6	"	3	Roach	1	158	CF	62				
7	"	3	"	2	143	"	47				
8	"	3	"	3	156	"	57				
9	"	3	"	4	168	"	79				
10	"	3	"	5	155	"	57				
11	"	3	"	6	147	"	56	F			
12	"	3	"	7	161	"	65				
13	"	3	"	8	156	"	60				
14	"	3	"	9	154	"	65				
15	"	3	Redfin	1	179	TL	87				
16	"	3	"	2	146	"	52				
17	"	3	"	3	148	"	49				
18	"	3	"	4	182	"	88				
19	"	3	"	5	164	"	70				
20	"	3	"	6	183	"	73				
21	"	4	SF Eel	2	697	"	1023				
22	"	4	redfin	7	166	"	64				
23	"	4	"	8	183	"	91				
24	"	4	Tench	5	164	"	80				
25	✓	5	"	6	174	✓	71				

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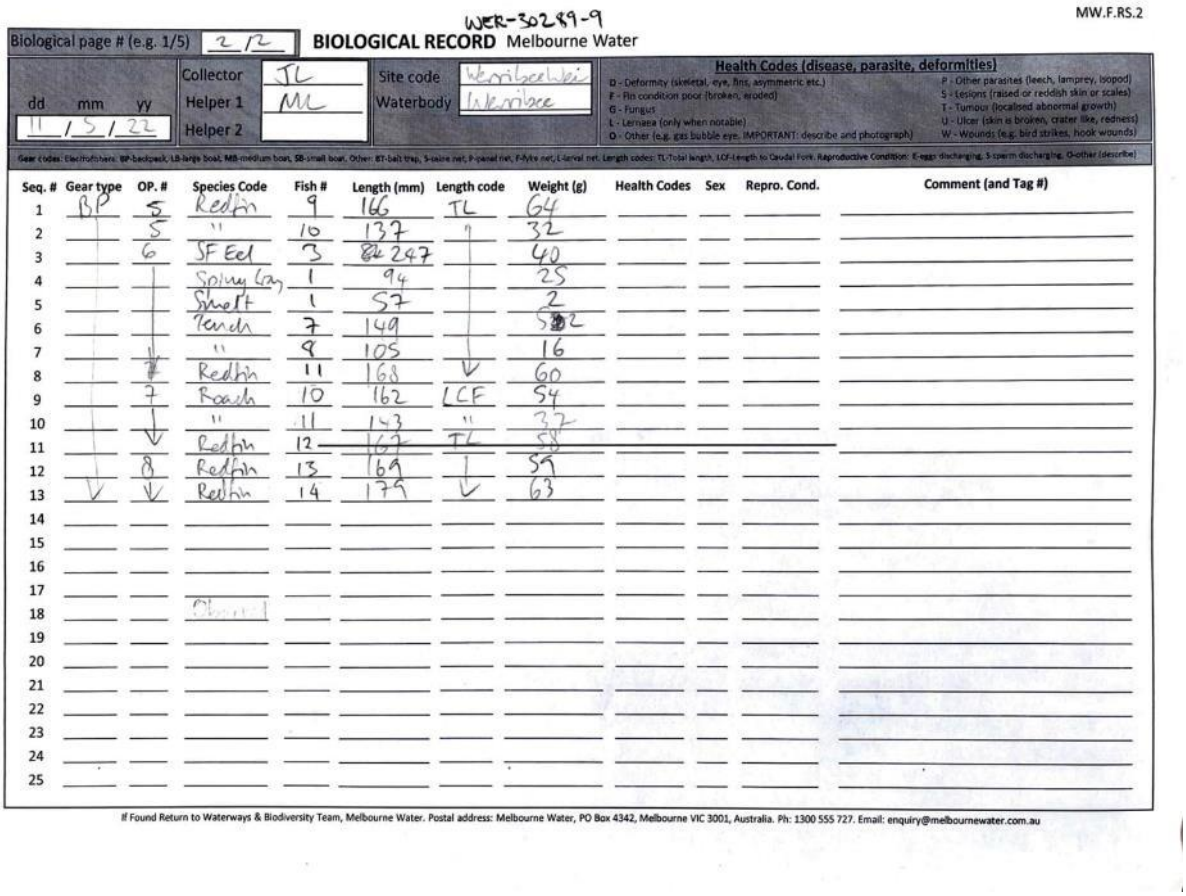

WER-30289-9

MW.F.RS.2

Biological page # (e.g. 1/5) 2/2

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 11/5/22

Collector: JL

Helper 1: ML

Helper 2:

Site code: Werribee Weir

Waterbody: Lk Werribee

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	5	Redfin	9	166	TL	64				
2		5	"	10	137	"	32				
3		6	SF Eel	3	247	"	40				
4			Spiny Gy	1	94		25				
5			Smelt	1	57		2				
6			Tench	7	149		582				
7			"	9	105		16				
8		7	Redfin	11	168	"	60				
9		7	Roach	10	162	LCF	54				
10			"	11	143	"	37				
11			Redfin	12	167	TL	58				
12		8	Redfin	13	169	"	59				
13			Redfin	14	179	"	63				
14											
15											
16											
17											
18			Observed								
19											
20											
21											
22											
23											
24											
25											

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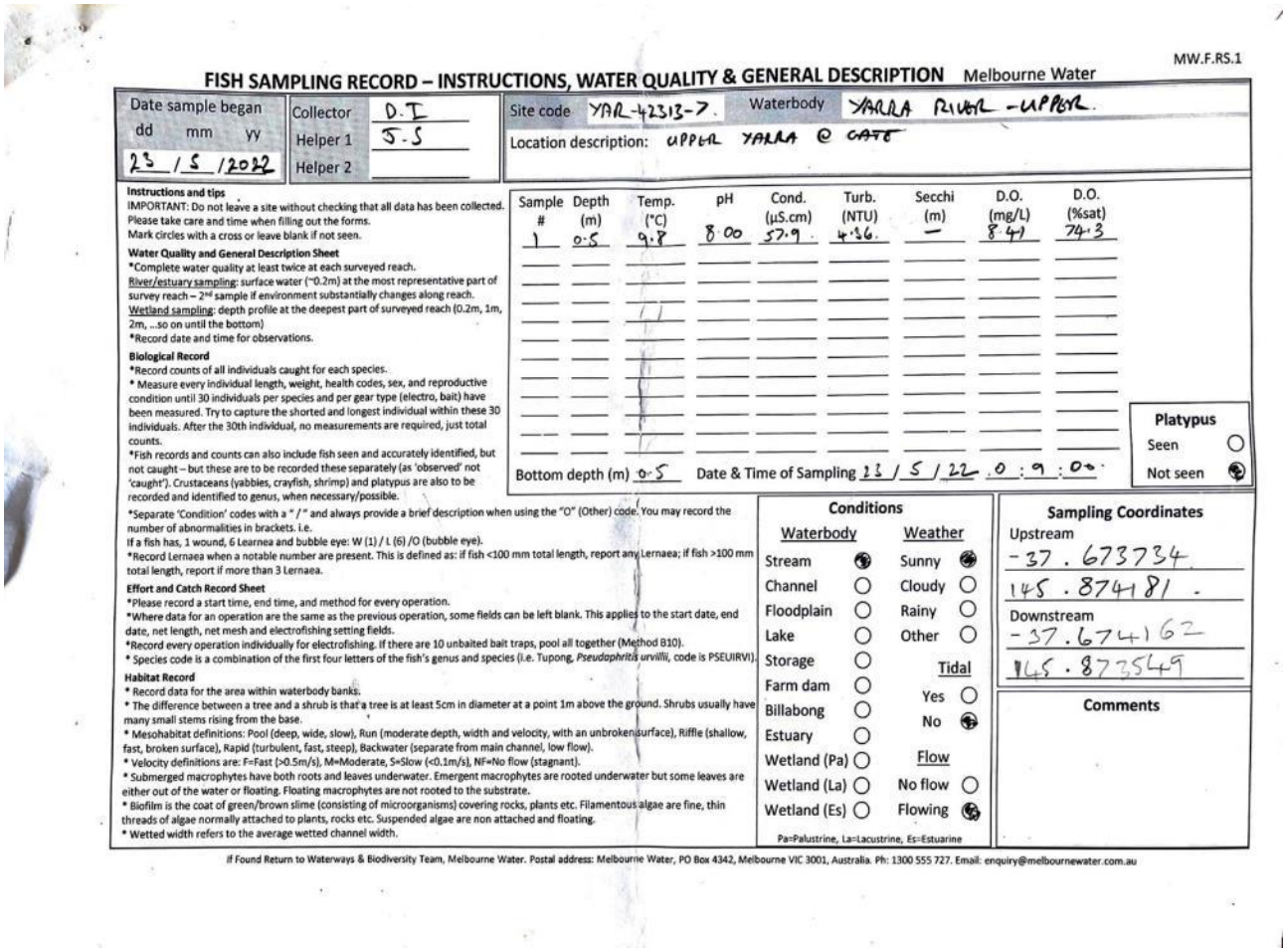

MW.F.RS.1

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

Date sample began (dd mm yy): 23 / 5 / 2022

Collector: D.I

Helper 1: S.S

Helper 2:

Site code: YAR-42313-7 Waterbody: YARRA RIVER - UPPER

Location description: UPPER YARRA @ CATE

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.5	9.8	8.00	57.9	4.36	—	8.47	74.3

Bottom depth (m): 0.5

Date & Time of Sampling: 23 / 5 / 22 . 0 : 9 : 0a

Platypus: Seen ○ Not seen ●

Conditions

Waterbody		Weather	
Stream	●	Sunny	●
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	●
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	●
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37.673734
145.874181

Downstream
-37.674162
145.873549

Comments

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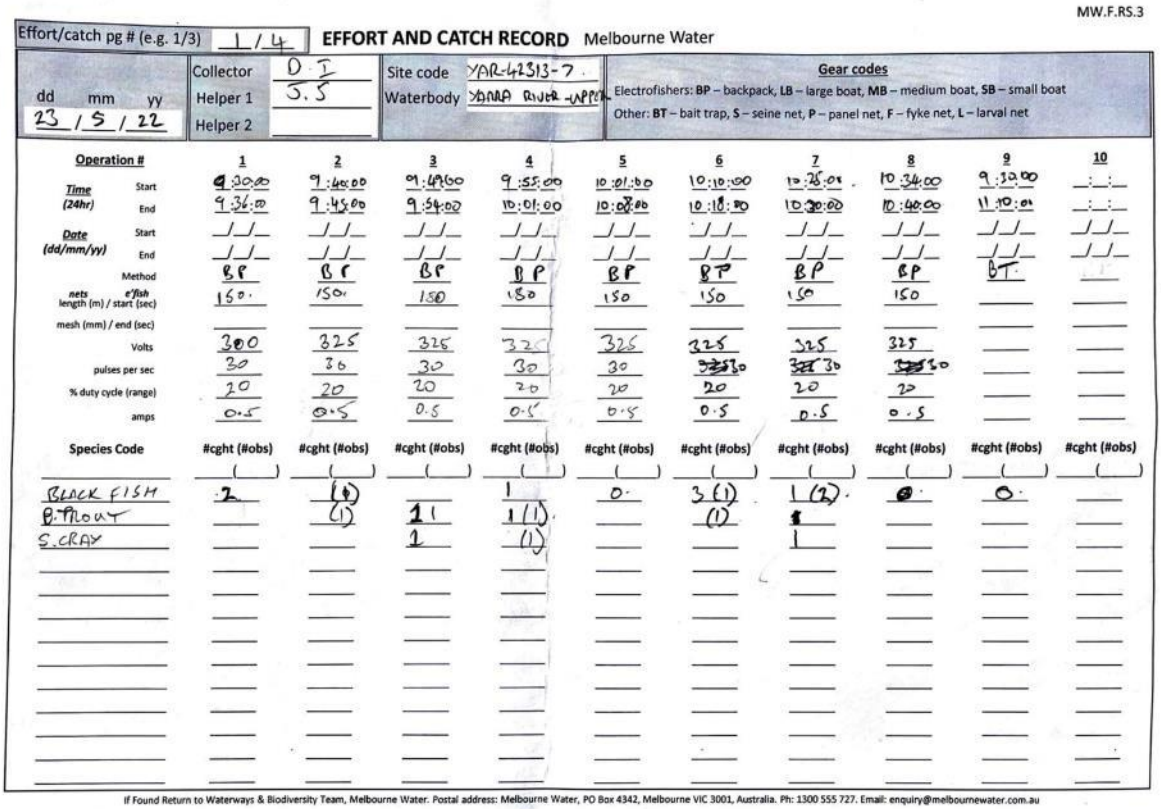

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) 1/4

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 23 / 5 / 22

Collector: D I
Helper 1: S.S
Helper 2:

Site code: YAR-42313-7
Waterbody: YARRA RIVER - UPPER

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #		1	2	3	4	5	6	7	8	9	10
Time (24hr)	Start	9:30:00	9:40:00	9:49:00	9:55:00	10:01:00	10:10:00	10:26:00	10:34:00	9:30:00	::
	End	9:36:00	9:45:00	9:54:00	10:01:00	10:08:00	10:18:00	10:30:00	10:40:00	11:10:00	::
Date (dd/mm/yy)	Start	//	//	//	//	//	//	//	//	//	//
	End	//	//	//	//	//	//	//	//	//	//
Method		BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / e-fish start (sec)		150	150	150	150	150	150	150	150		
mesh (mm) / end (sec)											
Volts		300	325	325	325	325	325	325	325		
pulses per sec		30	30	30	30	30	30	30	30		
% duty cycle (range)		20	20	20	20	20	20	20	20		
amps		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
BLACK FISH	2	(4)		1	0	3 (1)	1 (2)	0	0	
B. TROUT		(1)	1 1	1 (1)		(1)	1			
S. CRAY			1	(1)			1			

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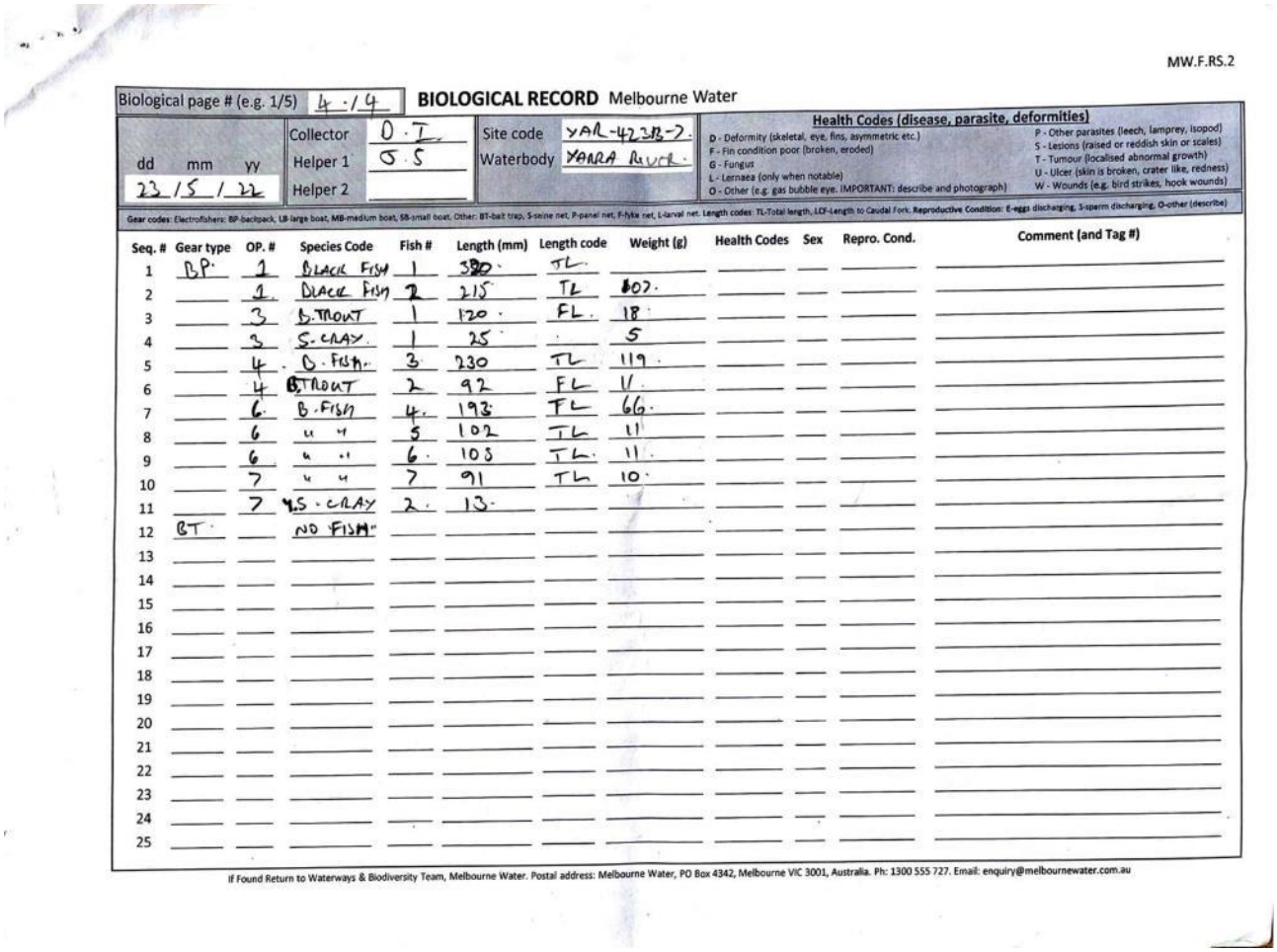

MW.F.RS.2

Biological page # (e.g. 1/5) 4 / 4

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 23 / 5 / 22

Collector: O. T.
Helper 1: S. S
Helper 2:

Site code: YAR-42383-7
Waterbody: YARRA RIVER

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Larnaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP.	1	BLACK FISH	1	380.	TL					
2		1	BLACK FISH	2	215	TL	807.				
3		3	B. TROUT	1	120.	FL.	18				
4		3	S. CRAY.	1	25	.	5				
5		4	B. FISH.	3	230	TL	119.				
6		4	B. TROUT	2	92	FL	11.				
7		6.	B. FISH	4.	193	FL	66.				
8		6	" "	5	102	TL	11				
9		6	" "	6.	105	TL.	11.				
10		7	" "	7	91	TL	10.				
11		7	M.S. CRAY	2.	13.						
12	BT.		NO FISH"								
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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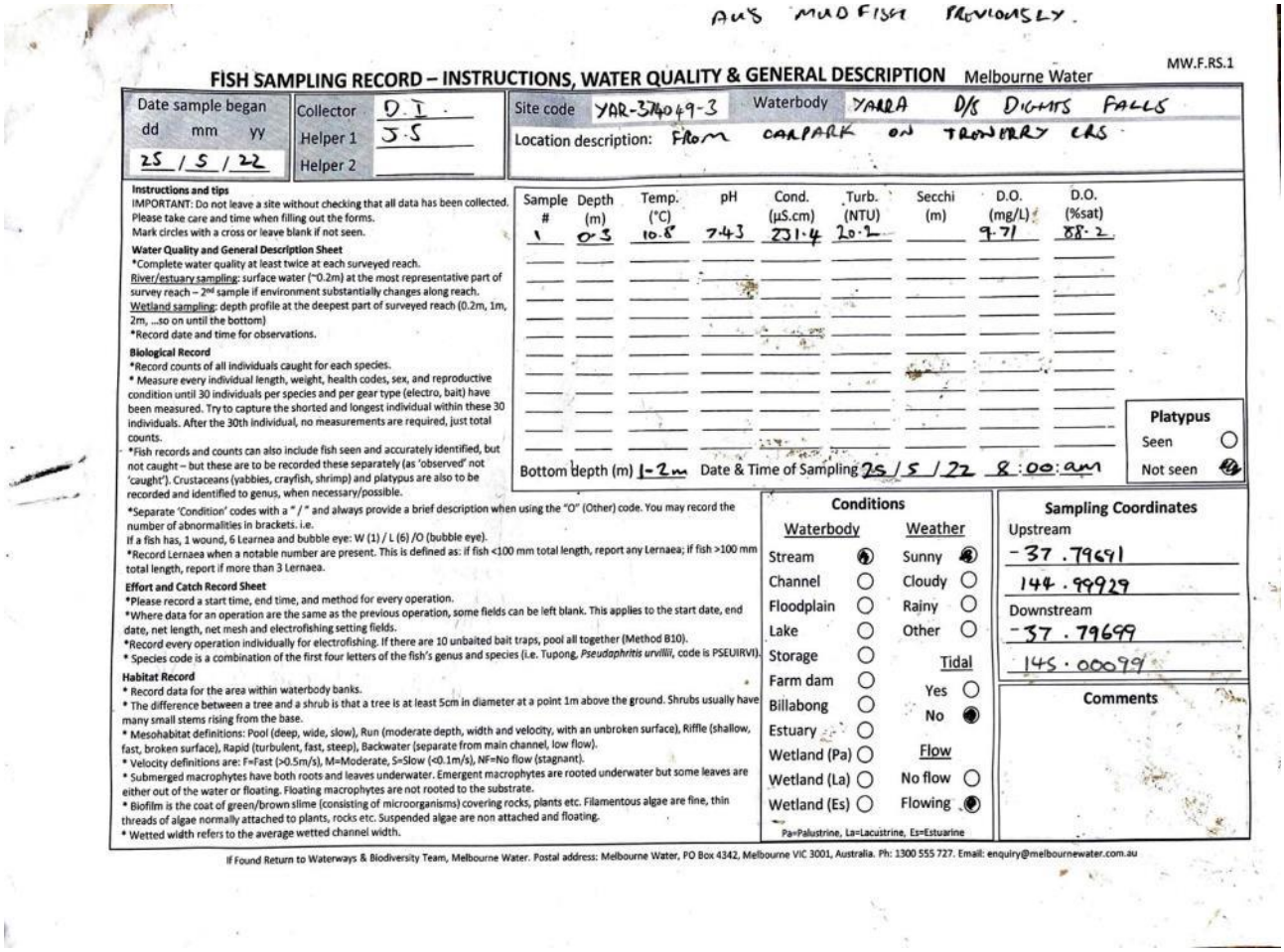

AUS MUD FISH PREVIOUSLY.

MW.F.RS.1

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

Date sample began dd mm yy: 25 / 5 / 22

Collector: D. I.
Helper 1: J. S
Helper 2:

Site code: YAR-374049-3 Waterbody: YARRA D/S DIGHTS FALLS

Location description: FROM CARPARK ON TRENERRY CRS

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.3	10.8	7.43	231.4	20.2		9.71	88.2

Bottom depth (m) 1-2m Date & Time of Sampling 25 / 5 / 22 8:00 am

Platypus: Seen ○ Not seen ●

Conditions

Waterbody		Weather	
Stream	●	Sunny	●
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	Tidal	
Farm dam	○	Yes	○
Billabong	○	No	●
Estuary	○		
Wetland (Pa)	○	Flow	
Wetland (La)	○	No flow	○
Wetland (Es)	○	Flowing	●

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37.79691
144.99929
Downstream
-37.79699
145.00099

Comments

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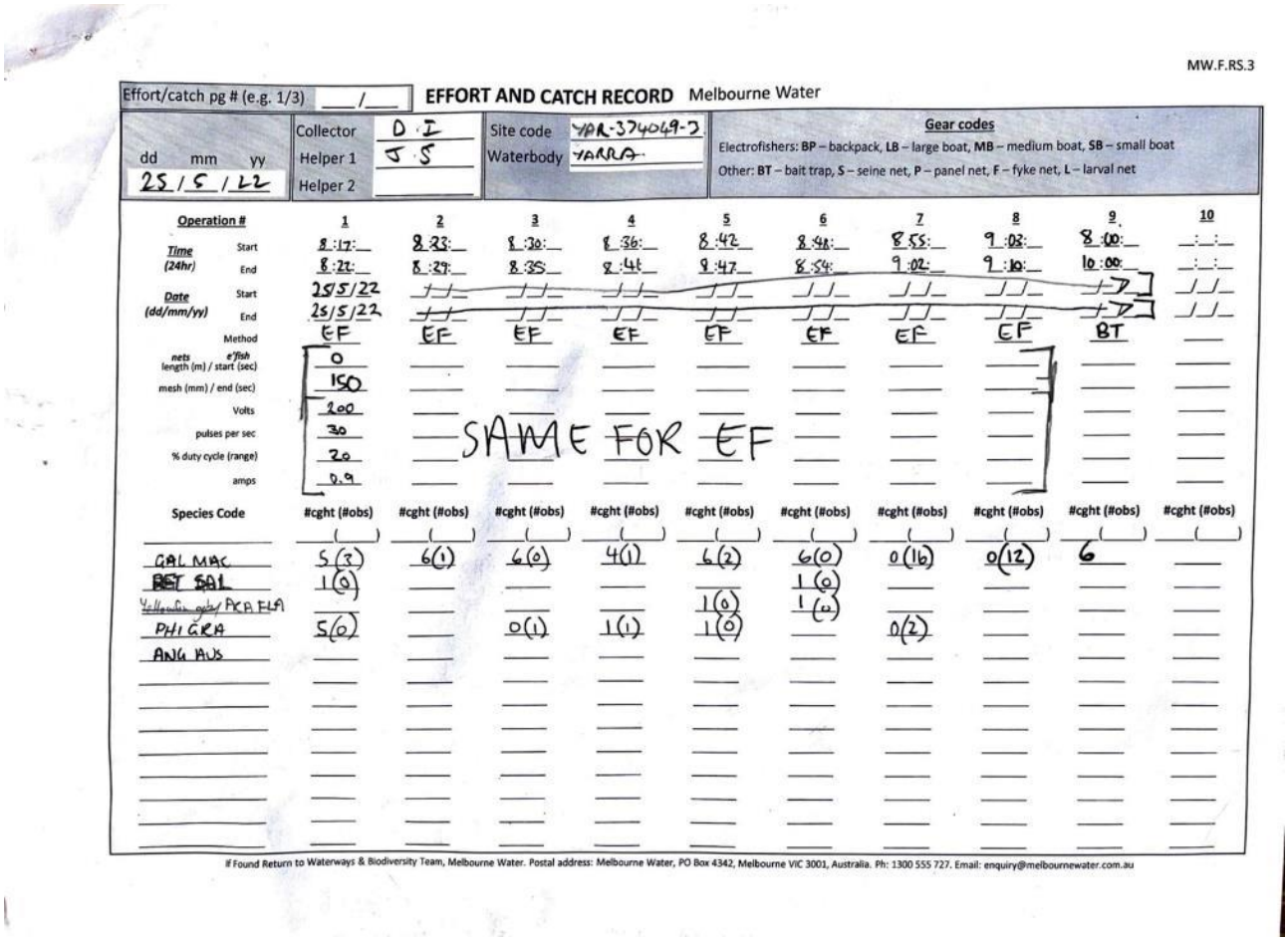

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 25/5/22

Collector: D.I

Helper 1: J.S

Helper 2:

Site code: YAR-374049-3

Waterbody: YARRA

Gear codes

Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat

Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	8:17	8:33	8:30	8:36	8:42	8:48	8:55	9:03	8:00	::
Time (24hr) End	8:21	8:37	8:35	8:41	8:47	8:54	9:02	9:10	10:00	::
Date (dd/mm/yy) Start	25/5/22	//	//	//	//	//	//	//	//	//
Date (dd/mm/yy) End	25/5/22	//	//	//	//	//	//	//	//	//
Method	EF	EF	EF	EF	EF	EF	EF	EF	BT	
nets length (m) / e'fish start (sec)	0									
mesh (mm) / end (sec)	150									
Volts	200									
pulses per sec	30	SAME FOR EF								
% duty cycle (range)	20									
amps	0.9									

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
GAL MAC	5(3)	6(1)	6(0)	4(1)	6(2)	6(0)	0(16)	0(12)	6	
~~BET SAL~~	1(0)					1(0)				
Yellowfin goby PCB FLA					1(0)	1(2)				
PHI GRA	5(0)		0(1)	1(1)	1(0)		0(2)			
ANG AUS										

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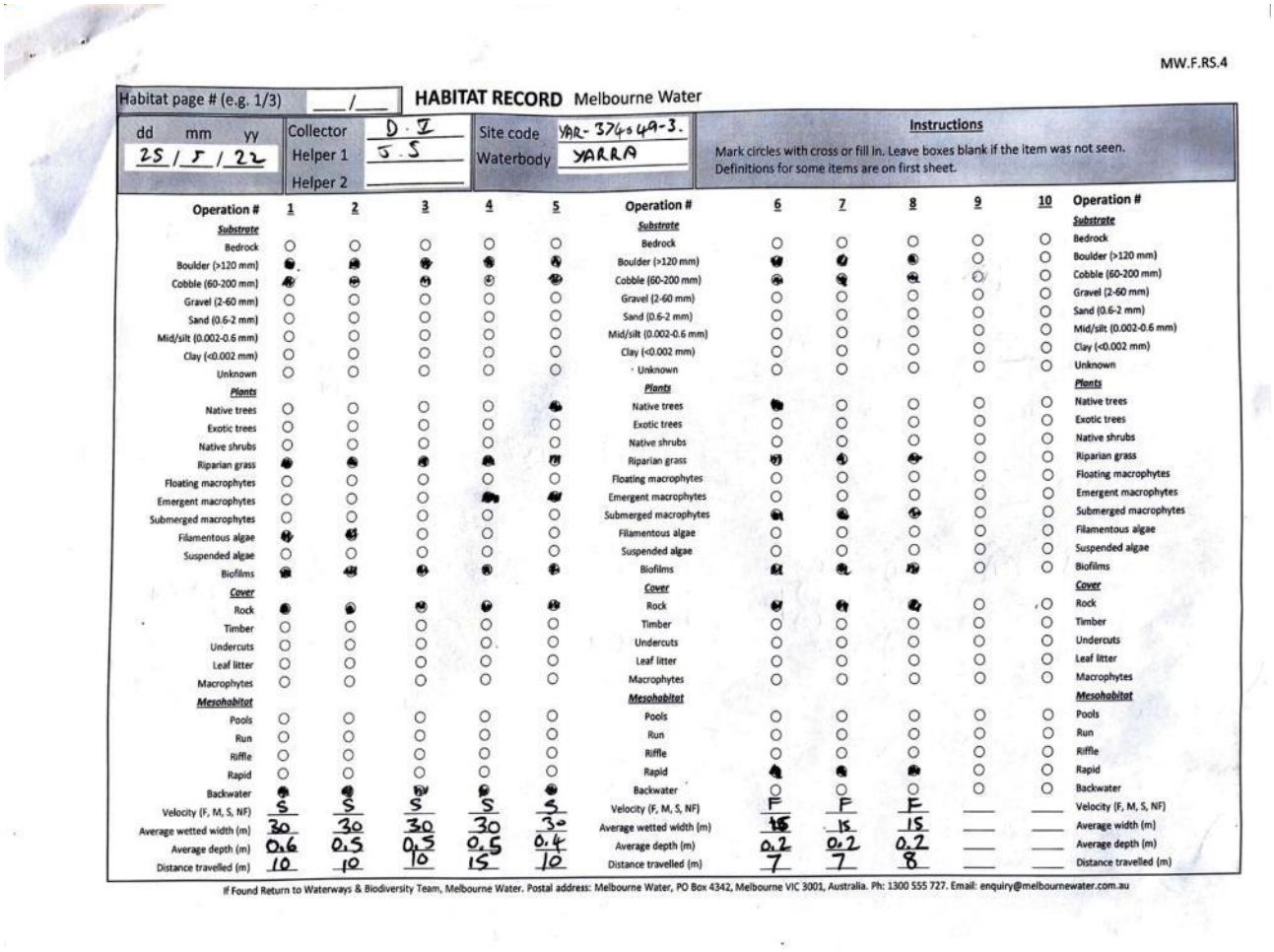

MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy: 25 / 5 / 22

Collector: D. I

Helper 1: J. S

Helper 2:

Site code: YAR-37s49-3.

Waterbody: YARRA

Instructions

Mark circles with cross or fill in. Leave boxes blank if the item was not seen. Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	●	●	●	●	●	Boulder (>120 mm)	●	●	●	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	●	●	●	●	●	Cobble (60-200 mm)	●	●	●	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	○	○	○	○	●	Native trees	●	○	○	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	○	○	○	○	○	Native shrubs	○	○	○	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	●	●	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	○	○	○	●	●	Emergent macrophytes	○	○	○	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	●	●	●	○	○	Submerged macrophytes
Filamentous algae	●	●	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	Biofilms	●	●	●	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	●	●	●	●	●	Rock	●	●	●	○	○	Rock
Timber	○	○	○	○	○	Timber	○	○	○	○	○	Timber
Undercuts	○	○	○	○	○	Undercuts	○	○	○	○	○	Undercuts
Leaf litter	○	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	○	○	○	○	○	Macrophytes	○	○	○	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	○	○	○	○	○	Pools	○	○	○	○	○	Pools
Run	○	○	○	○	○	Run	○	○	○	○	○	Run
Riffle	○	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	●	●	●	○	○	Rapid
Backwater	●	●	●	●	●	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	S	S	S	S	S	Velocity (F, M, S, NF)	F	F	F	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	30	30	30	30	30	Average wetted width (m)	~~15~~	15	15	___	___	Average width (m)
Average depth (m)	0.6	0.5	0.5	0.5	0.4	Average depth (m)	0.2	0.2	0.2	___	___	Average depth (m)
Distance travelled (m)	10	10	10	15	10	Distance travelled (m)	7	7	8	___	___	Distance travelled (m)

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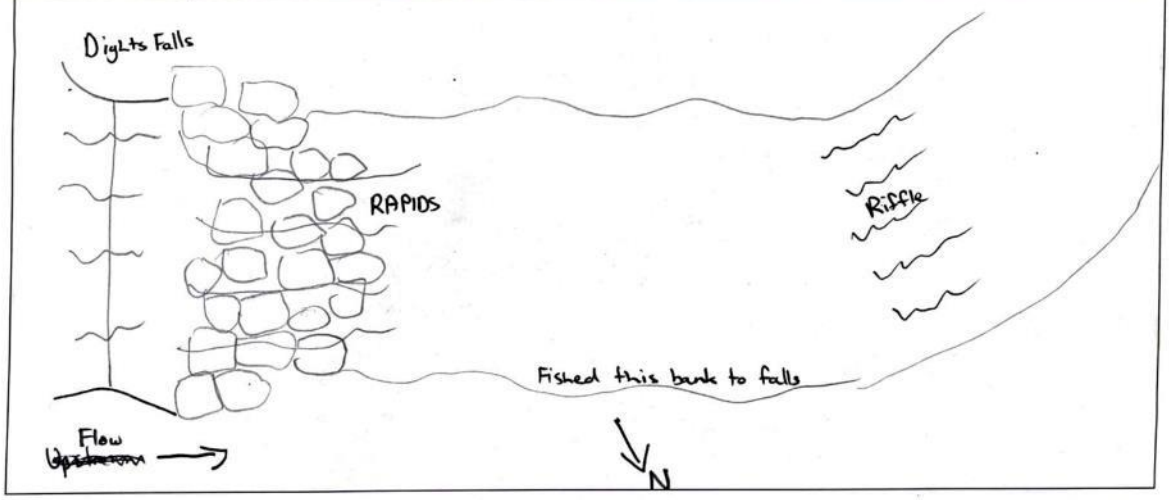
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
25 / 4 / 22	J.S	YAL-37409-3	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody DARRA	



Comments:

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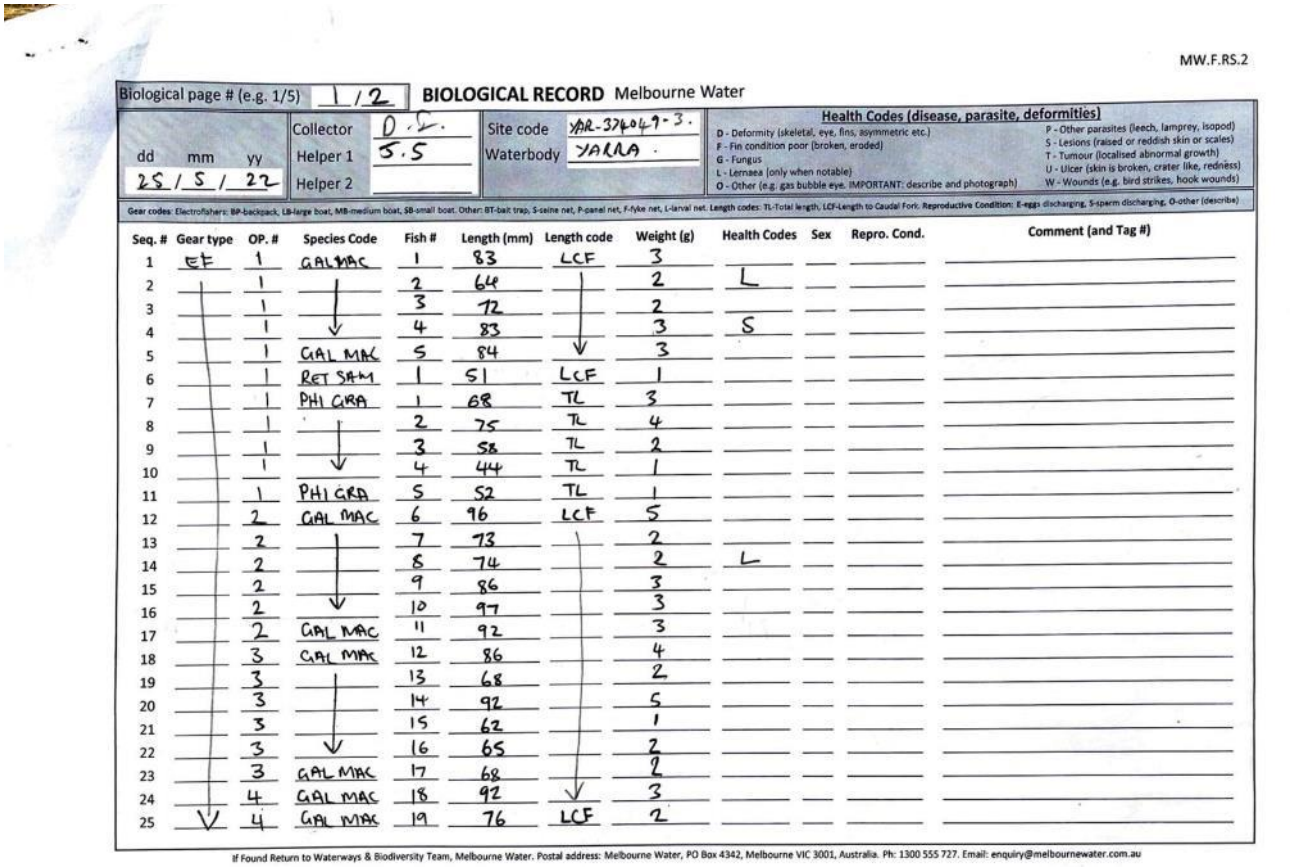

MW.F.RS.2

Biological page # (e.g. 1/5) 1 / 2 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 25 / 5 / 22

Collector: D.S.
Helper 1: S.S
Helper 2:

Site code: YAR-37049-3.
Waterbody: YARRA

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	EF	1	GALMAC	1	83	LCF	3				
2	"	1	"	2	64	"	2	L			
3	"	1	"	3	72	"	2				
4	"	1	"	4	83	"	3	S			
5	"	1	GAL MAC	5	84	"	3				
6	"	1	RET SAM	1	51	LCF	1				
7	"	1	PHI CRA	1	68	TL	3				
8	"	1	"	2	75	TL	4				
9	"	1	"	3	58	TL	2				
10	"	1	"	4	44	TL	1				
11	"	1	PHI CRA	5	52	TL	1				
12	"	2	GAL MAC	6	96	LCF	5				
13	"	2	"	7	73	"	2				
14	"	2	"	8	74	"	2	L			
15	"	2	"	9	86	"	3				
16	"	2	"	10	97	"	3				
17	"	2	GAL MAC	11	92	"	3				
18	"	3	GAL MAC	12	86	"	4				
19	"	3	"	13	68	"	2				
20	"	3	"	14	92	"	5				
21	"	3	"	15	62	"	1				
22	"	3	"	16	65	"	2				
23	"	3	GAL MAC	17	68	"	2				
24	"	4	GAL MAC	18	92	"	3				
25	"	4	GAL MAC	19	76	LCF	2				

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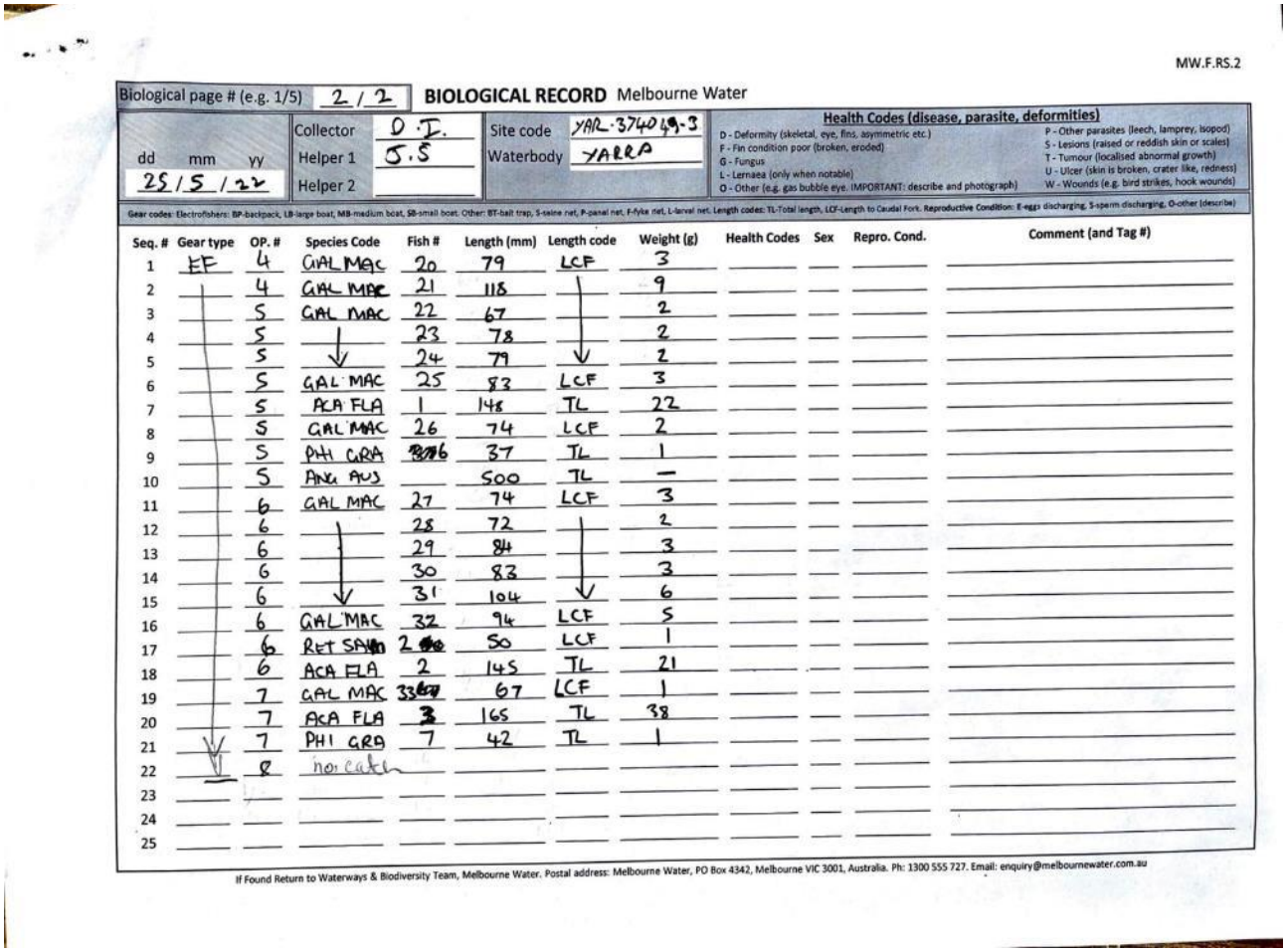

MW.F.RS.2

Biological page # (e.g. 1/5) 2 / 2 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 25 / 5 / 22

Collector: D. I.
Helper 1: S. S
Helper 2:

Site code: YAR-37401.9-3
Waterbody: YARRA

Health Codes (disease, parasite, deformities)
D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	EF	4	GAL MAC	20	79	LCF	3				
2		4	GAL MAC	21	118		9				
3		5	GAL MAC	22	67		2				
4		5		23	78		2				
5		5		24	79		2				
6		5	GAL MAC	25	83	LCF	3				
7		5	ACA FLA	1	148	TL	22				
8		5	GAL MAC	26	74	LCF	2				
9		5	PHI GRA	[illegible]	37	TL	1				
10		5	ANG AUS		500	TL	—				
11		6	GAL MAC	27	74	LCF	3				
12		6		28	72		2				
13		6		29	84		3				
14		6		30	83		3				
15		6		31	104		6				
16		6	GAL MAC	32	94	LCF	5				
17		6	RET SAH	2 [illegible]	50	LCF	1				
18		6	ACA FLA	2	145	TL	21				
19		7	GAL MAC	33 [illegible]	67	LCF	1				
20		7	ACA FLA	3	165	TL	38				
21	V	7	PHI GRA	7	42	TL	1				
22	V	8	no catch								
23											
24											
25											

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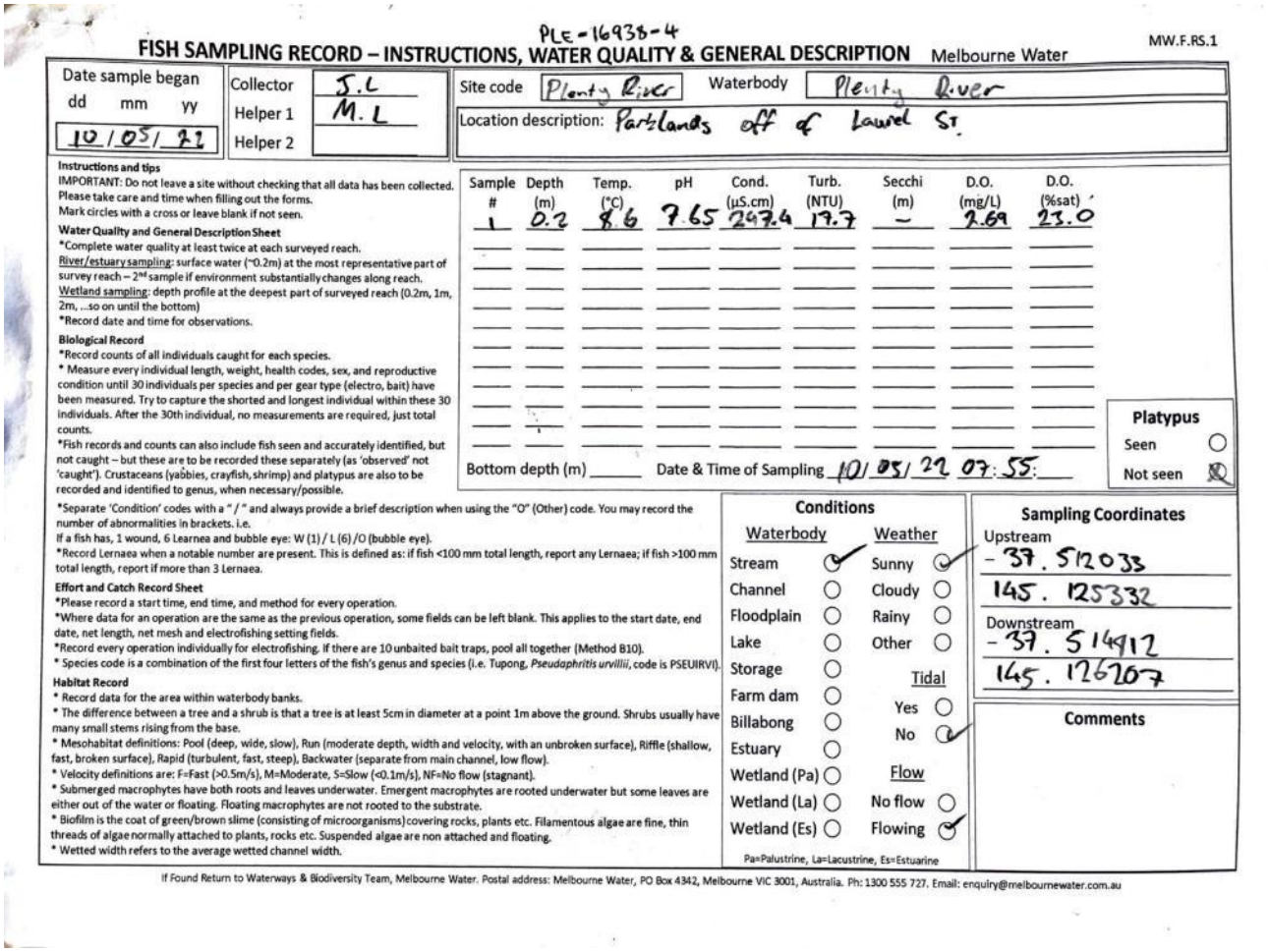

PLE-16938-4

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water MW.F.RS.1

Date sample began dd mm yy: 10/05/22 | Collector: J.L | Helper 1: M.L | Helper 2:

Site code: Plenty River | Waterbody: Plenty River

Location description: Parklands off of Laurel St.

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	8.6	7.65	247.4	19.7	~	7.69	73.0

Bottom depth (m) _____ Date & Time of Sampling 10/05/22 07:55:

Platypus: Seen ○ Not seen ⊗

*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Conditions

Waterbody		Weather	
Stream	✓	Sunny	✓
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○		
Farm dam	○	Tidal	
Billabong	○	Yes	○
Estuary	○	No	✓
Wetland (Pa)	○	Flow	
Wetland (La)	○	No flow	○
Wetland (Es)	○	Flowing	✓

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37.512033
145.125332
Downstream
-37.514912
145.126207

Comments

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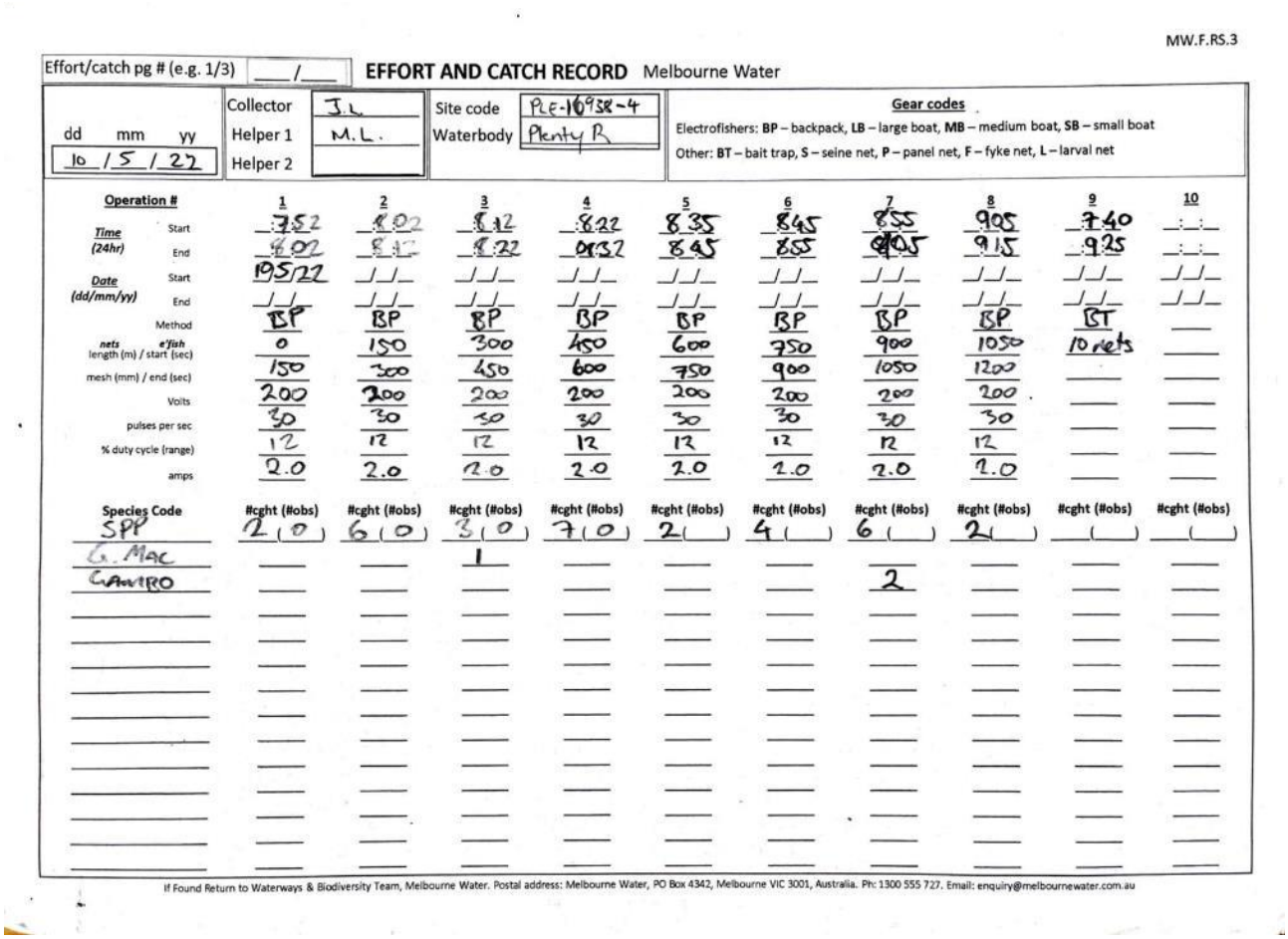

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 10 / 5 / 22

Collector: J.L.
Helper 1: M.L.
Helper 2:

Site code: PLE-10938-4
Waterbody: Plenty R.

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	7.52	8.02	8.12	8.22	8.35	8.45	8.55	9.05	7.40	::
Time (24hr) End	8.02	8.12	8.22	0932	8.45	8.55	9.05	9.15	9.25	::
Date (dd/mm/yy) Start	10/5/22	//	//	//	//	//	//	//	//	//
Date (dd/mm/yy) End	//	//	//	//	//	//	//	//	//	//
Method	BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / e'fish start (sec)	0	150	300	450	600	750	900	1050	10 nets	
mesh (mm) / end (sec)	150	300	450	600	750	900	1050	1200		
Volts	200	200	200	200	200	200	200	200		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	12	12	12	12	12	12	12	12		
amps	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
SPP	2 (0)	6 (0)	3 (0)	7 (0)	2 ( )	4 ( )	6 ( )	2 ( )	( )	( )
G. MAC			1							
CARPRO							2			

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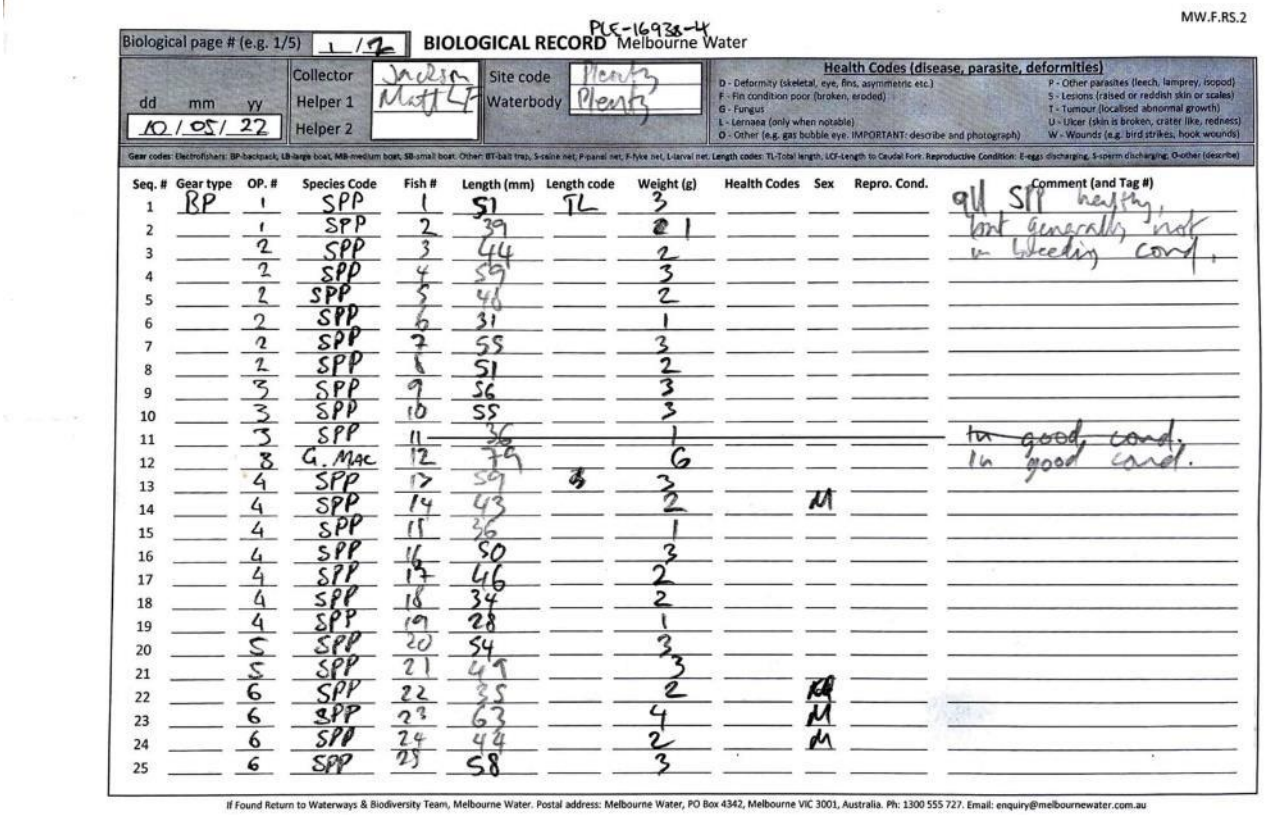

MW.F.RS.2

PLE-16938-4

Biological page # (e.g. 1/5) 1 / 7 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 10 / 05 / 22

Collector: Jackson
Helper 1: Matt LP
Helper 2:

Site code: Plenty
Waterbody: Plenty

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack; LB-large boat; MB-medium boat; SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	SPP	1	51	TL	3				all SPP healthy, but generally not in breeding cond.
2		1	SPP	2	39		1				
3		2	SPP	3	44		2				
4		2	SPP	4	49		3				
5		2	SPP	5	48		2				
6		2	SPP	6	31		1				
7		2	SPP	7	55		3				
8		2	SPP	8	51		2				
9		3	SPP	9	56		3				
10		3	SPP	10	55		3				
11		3	SPP	11	36		1				~~in good cond.~~
12		8	G. Mac	12	79		6				in good cond.
13		4	SPP	13	59	S	3				
14		4	SPP	14	43		2		M		
15		4	SPP	15	36		1				
16		4	SPP	16	50		3				
17		4	SPP	17	46		2				
18		4	SPP	18	34		2				
19		4	SPP	19	28		1				
20		5	SPP	20	54		3				
21		5	SPP	21	47		3				
22		6	SPP	22	35		2		M		
23		6	SPP	23	63		4		M		
24		6	SPP	24	44		2		M		
25		6	SPP	25	58		3				

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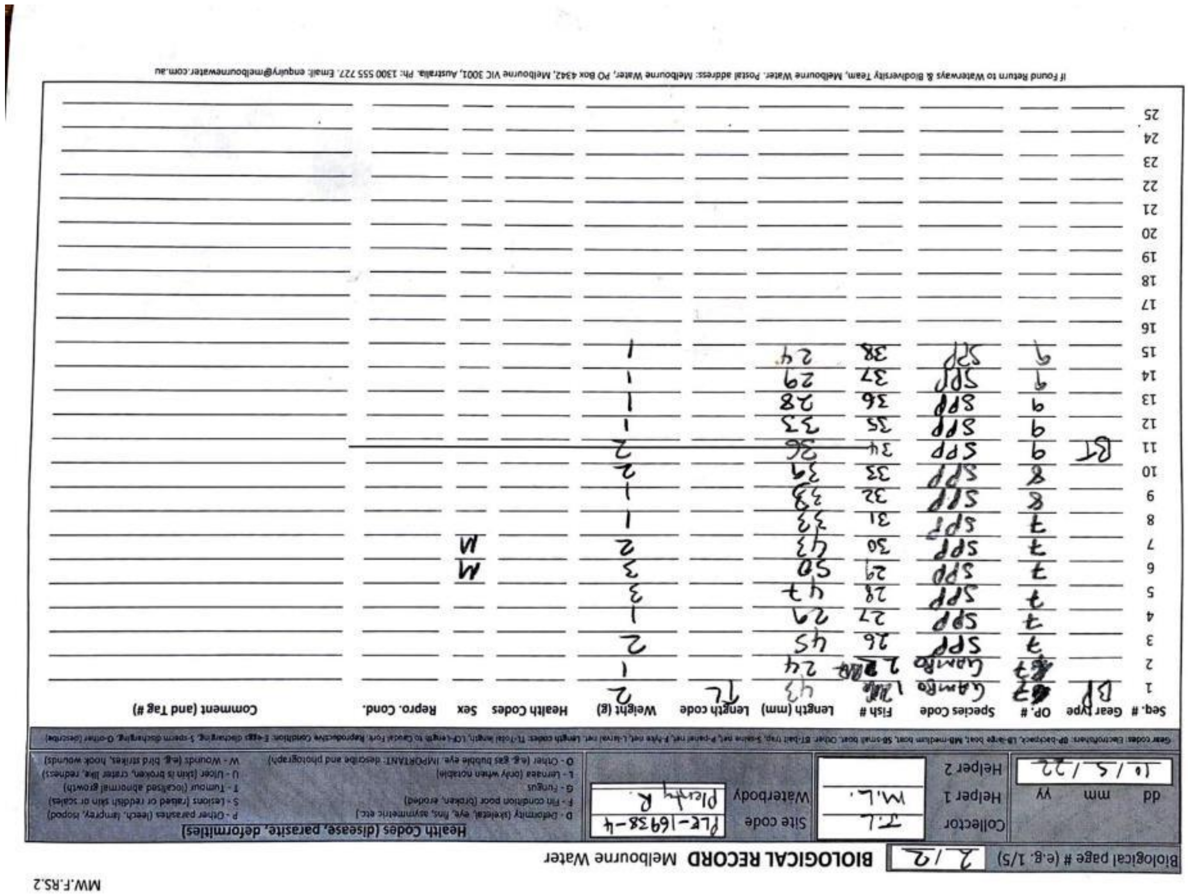

MW.F.RS.2

Biological page # (e.g. 1/5) 2 / 2 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 10 / 5 / 22

Collector: J.L
Helper 1: M.L.
Helper 2:
Site code: PLE-16938-4
Waterbody: Plenty R.

Health Codes (disease, parasite, deformities)
D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	7	GAMBO	1	43	TL	2				
2		7	GAMBO	2	24		1				
3		7	SPP	26	45		2				
4		7	SPP	27	29		1				
5		7	SPP	28	47		3				
6		7	SPP	29	50		3		M		
7		7	SPP	30	43		2		M		
8		7	SPP	31	33		1				
9		8	SPP	32	33		1				
10		8	SPP	33	39		2				
11	BT	9	SPP	34	36		2				
12		9	SPP	35	33		1				
13		9	SPP	36	28		1				
14		9	SPP	37	29		1				
15		9	SPP	38	24		1				
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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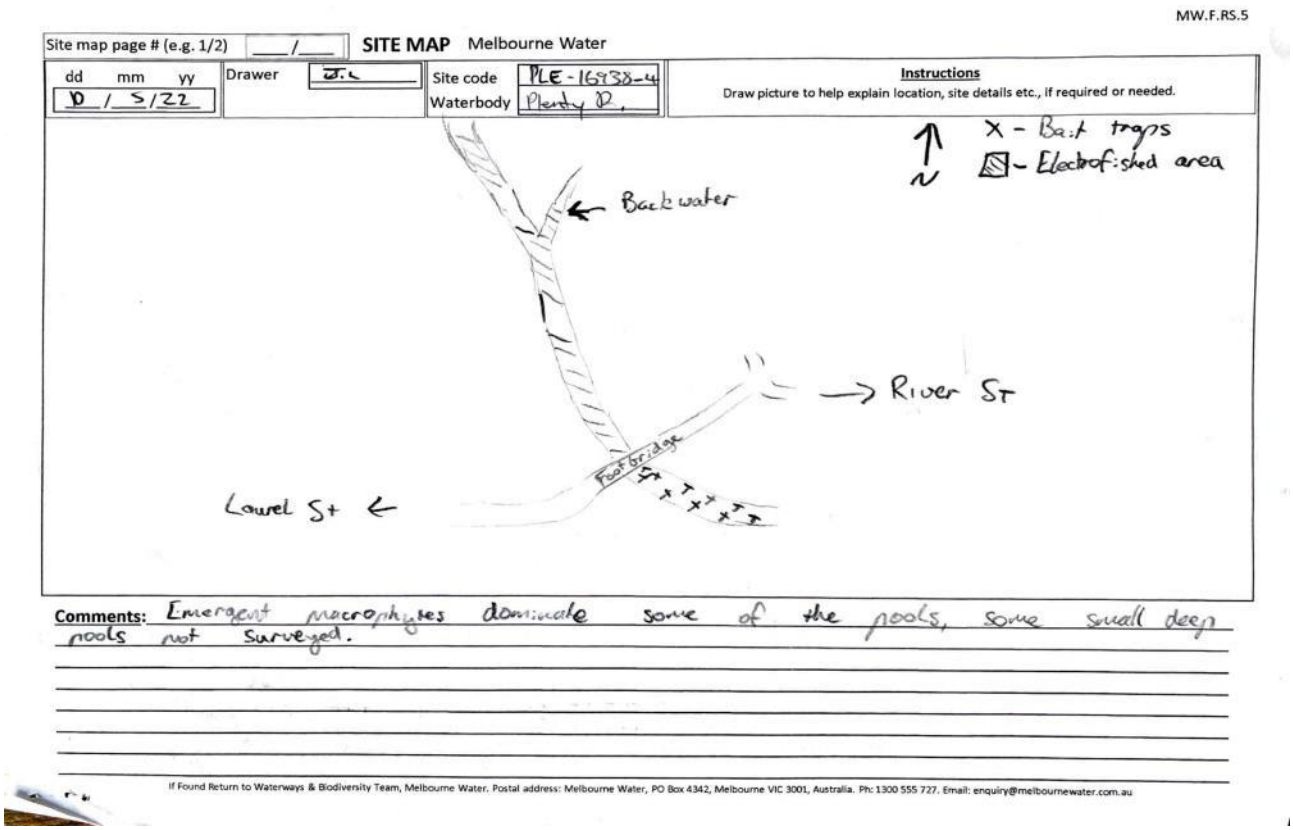

MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
10/5/22	J.L	PLE-16938-4	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody Plenty R.	

Comments: Emergent macrophytes dominate some of the pools, some small deep pools not surveyed.

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Site data sheets115

MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___ **HABITAT RECORD** Melbourne Water

dd mm yy	Collector	Site code	Instructions
10/5/22	Helper 1 JL	PLE-16938-4	Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
	Helper 2 MiL	Waterbody Plenty R.	Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	●	●	●	●	●	Mid/silt (0.002-0.6 mm)	●	●	●	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	●	●	●	Native trees	●	●	●	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	○	○	○	○	○	Native shrubs	●	●	●	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	●	●	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	●	●	●	●	●	Emergent macrophytes	●	●	●	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	○	○	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	Biofilms	●	●	●	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	○	○	○	○	○	Rock	○	○	○	○	○	Rock
Timber	●	●	●	●	●	Timber	●	●	●	○	○	Timber
Undercuts	○	○	○	○	○	Undercuts	○	○	○	○	○	Undercuts
Leaf litter	●	●	●	●	●	Leaf litter	●	●	●	○	○	Leaf litter
Macrophytes	●	●	●	●	●	Macrophytes	●	●	●	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	●	●	●	●	●	Pools	●	●	●	○	○	Pools
Run	○	○	○	○	○	Run	○	○	○	○	○	Run
Riffle	○	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	S	S	S	S	S	Velocity (F, M, S, NF)	S	S	S	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	5	5	5	5	5	Average wetted width (m)	5	5	5	___	___	Average width (m)
Average depth (m)	0.5	0.5	0.5	0.5	0.5	Average depth (m)	0.5	0.5	0.5	___	___	Average depth (m)
Distance travelled (m)	15	15	15	15	15	Distance travelled (m)	15	15	15	___	___	Distance travelled (m)

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HOL-2685-5

MW.F.RS.1

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION

Melbourne Water

Date sample began dd mm yy	Collector	Site code	Waterbody
12/05/22	Helper 1 S.L	Hoddles Crz	Hoddles Crk, Little Yarra
	Helper 2 S.B	Location description: At Glenview bridge	

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	11.4	7.68	104.0	12.5	—	7.74	71.4

Bottom depth (m) _____ Date & Time of Sampling 11/5/22 :7:36

Platypus
Seen ○
Not seen ⊗

Conditions

Waterbody		Weather	
Stream	✓	Sunny	○
Channel	○	Cloudy	✓
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	✓
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	✓
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37.799075
145.585835
Downstream
-37.796690
145.584810

Comments

- Small barrier at bridge will primarily survey downstream and supplement if needed with upstream

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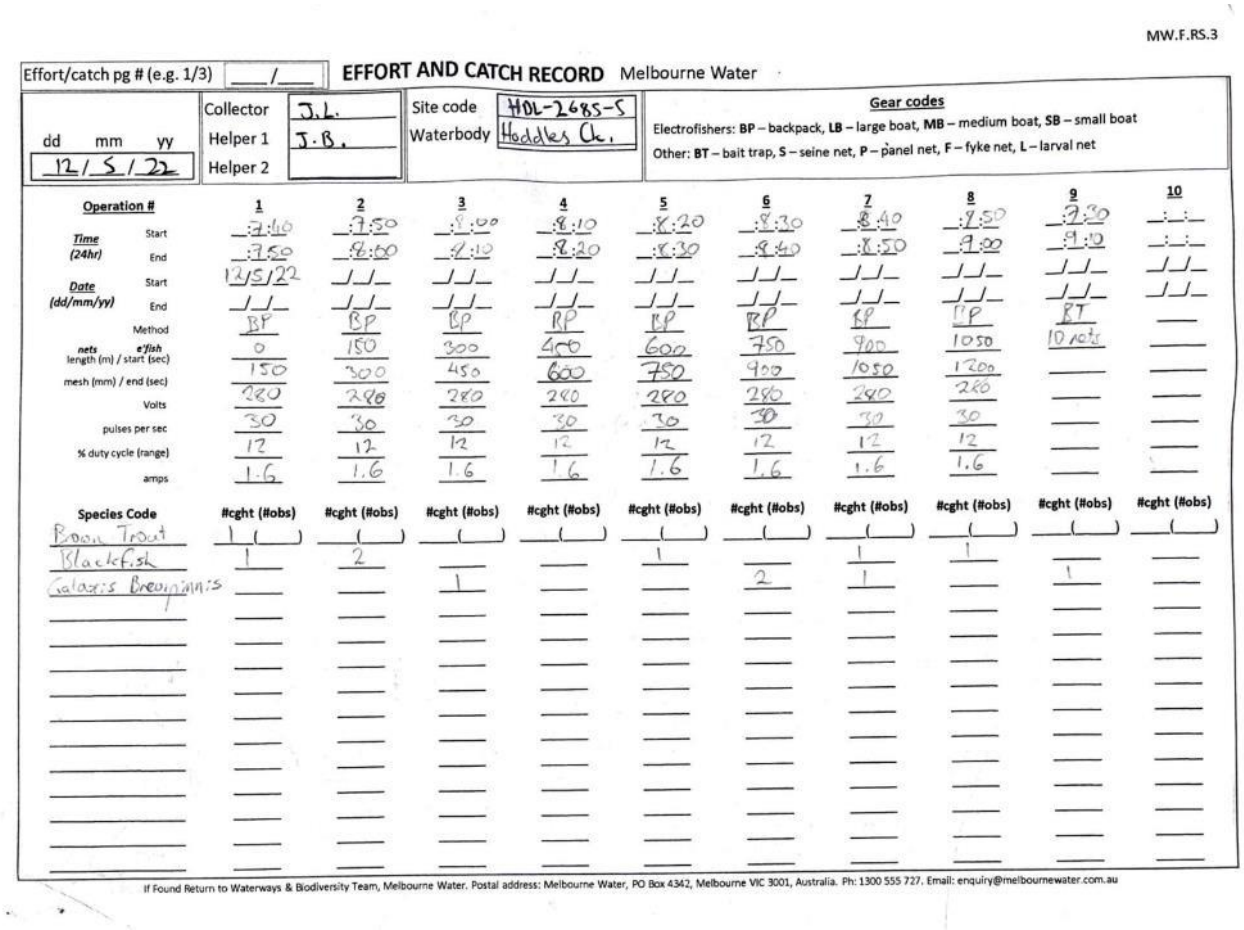

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 12/5/22

Collector: J.L.
Helper 1: J.B.
Helper 2:

Site code: HDL-2685-S
Waterbody: Hoddles Ck.

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #		1	2	3	4	5	6	7	8	9	10
Time (24hr)	Start	7:40	7:50	8:00	8:10	8:20	8:30	8:40	8:50	9:00	::
	End	7:50	8:00	8:10	8:20	8:30	8:40	8:50	9:00	9:10	::
Date (dd/mm/yy)	Start	12/5/22	//	//	//	//	//	//	//	//	//
	End	//	//	//	//	//	//	//	//	//	//
Method		BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / start (sec)	e-fish	0	150	300	450	600	750	900	1050	10 mins	
mesh (mm) / end (sec)		150	300	450	600	750	900	1050	1200		
Volts		280	280	280	280	280	280	280	280		
pulses per sec		30	30	30	30	30	30	30	30		
% duty cycle (range)		12	12	12	12	12	12	12	12		
amps		1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
Brown Trout	1 ( )									
Blackfish	1	2			1		1	1		
Galaxias Brevipinnis			1			2	1		1	

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MW.F.RS.2

HDL-2685-5

Biological page # (e.g. 1/5) J.L/J.B **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 12/05/22

Collector:
Helper 1:
Helper 2:

Site code: Hoddles Crk
Waterbody: Hoddles Crk Little Yarra

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	B. Trout	1	277	LCF	227				
2		1	Blackfish	1	296	TL	293				
3		2	"	2	331		361				
4		2	"	3	221		103	O			Missing Eye/Cloudy
5		3	G. Orna	1	73	LCF	6				
6		5	B. Fish	4	364	TL	452	F, G, W			
7		6	G. Orna	2	63	LCF	5				
8		6	"	3	49		2				
9		7	"	4	40		1				
10		7	B. Fish	5	300	TL	237				
11		8	B. Fish	6	387	TL	338	F			
12	BT	9	G. Orna	5	47	LCF	1				
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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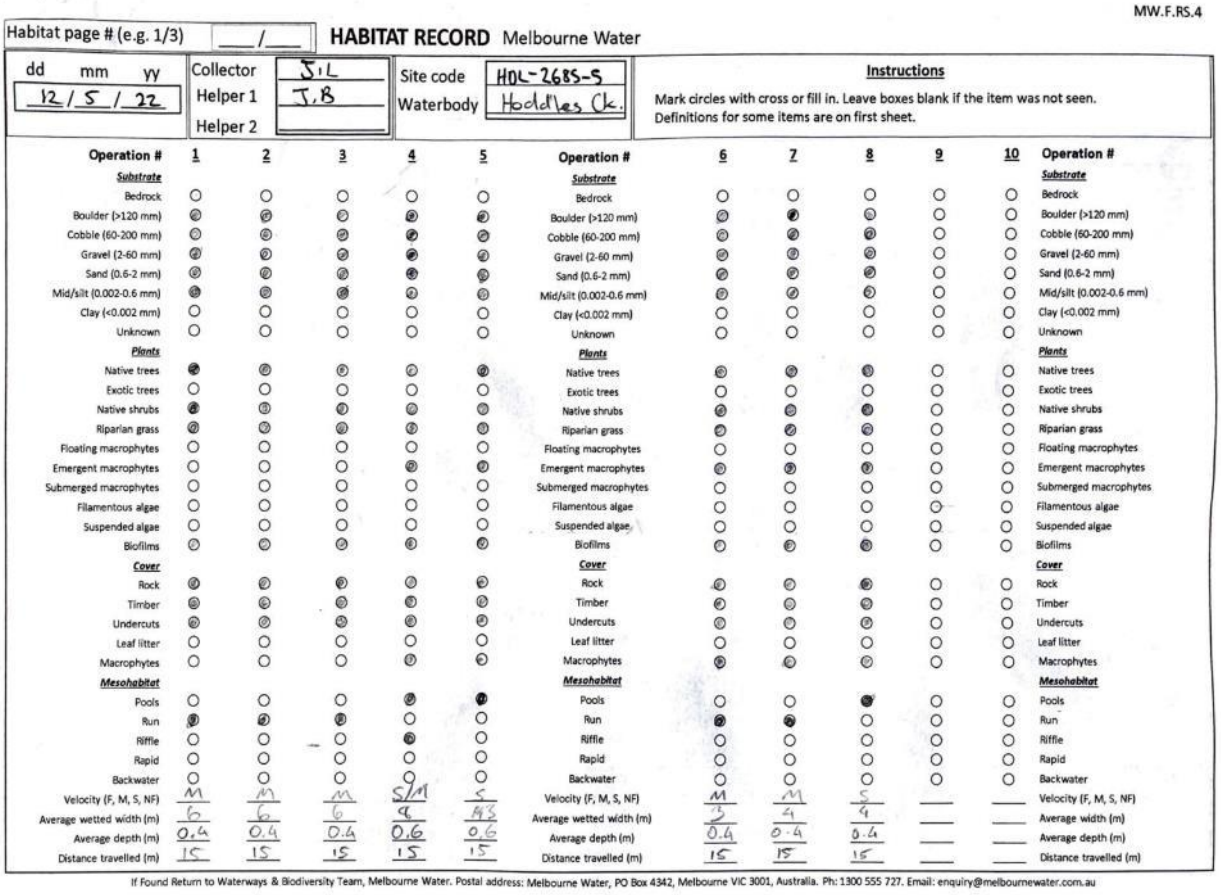

MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___ **HABITAT RECORD** Melbourne Water

dd mm yy	Collector	J.L	Site code	HDL-26BS-S
12/5/22	Helper 1	J.B	Waterbody	Hoddles Ck.
	Helper 2			

Instructions

Mark circles with cross or fill in. Leave boxes blank if the item was not seen. Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	◎	◎	◎	◎	◎	Boulder (>120 mm)	◎	◎	◎	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	◎	◎	◎	◎	◎	Cobble (60-200 mm)	◎	◎	◎	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	◎	◎	◎	◎	◎	Gravel (2-60 mm)	◎	◎	◎	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	◎	◎	◎	◎	◎	Sand (0.6-2 mm)	◎	◎	◎	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	◎	◎	◎	◎	◎	Mid/silt (0.002-0.6 mm)	◎	◎	◎	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	◎	◎	◎	◎	◎	Native trees	◎	◎	◎	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	◎	◎	◎	◎	◎	Native shrubs	◎	◎	◎	○	○	Native shrubs
Riparian grass	◎	◎	◎	◎	◎	Riparian grass	◎	◎	◎	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	○	○	○	◎	◎	Emergent macrophytes	◎	◎	◎	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	○	○	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	◎	◎	◎	◎	◎	Biofilms	◎	◎	◎	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	◎	◎	◎	◎	◎	Rock	◎	◎	◎	○	○	Rock
Timber	◎	◎	◎	◎	◎	Timber	◎	◎	◎	○	○	Timber
Undercuts	◎	◎	◎	◎	◎	Undercuts	◎	◎	◎	○	○	Undercuts
Leaf litter	○	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	○	○	○	◎	◎	Macrophytes	◎	◎	◎	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	○	○	○	◎	◎	Pools	○	○	◎	○	○	Pools
Run	◎	◎	◎	○	○	Run	◎	◎	○	○	○	Run
Riffle	○	○	○	◎	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	M	M	M	S/M	S	Velocity (F, M, S, NF)	M	M	S	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	6	6	6	9	8.5	Average wetted width (m)	3	4	4	___	___	Average width (m)
Average depth (m)	0.4	0.4	0.4	0.6	0.6	Average depth (m)	0.4	0.4	0.4	___	___	Average depth (m)
Distance travelled (m)	15	15	15	15	15	Distance travelled (m)	15	15	15	___	___	Distance travelled (m)

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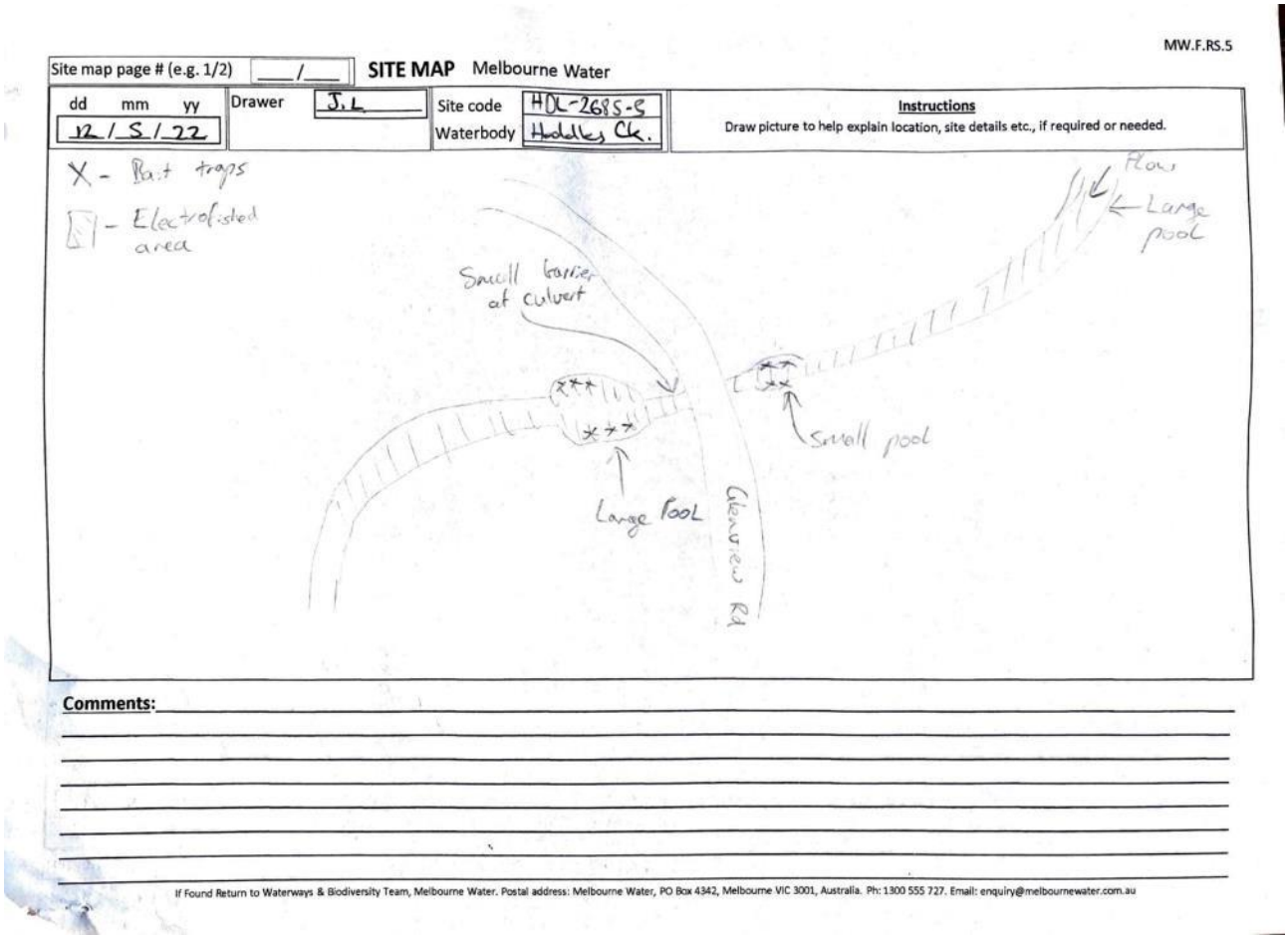

MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
12/5/22	J.L	HDL-2685-S	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody Holdley Ck.	

X - Bait traps

[ ] - Electrofished area

Comments:

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ART-4132-0

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
12/05/22	Helper 1 S.L	Arthurs Creek	Arthurs creek / Diamond Creek
	Helper 2 S.B	Location description: Downstream of Arthurs and Diamond creek confluence, upstream of Arthurs creek Rd.	

Instructions and tips
IMPORTANT: Do not leave a site without checking that all data has been collected. Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet
*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record
*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
if a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet
*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUURVI).

Habitat Record
* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	12.1	7.09	650	35.1	~	6.47	60.7

Bottom depth (m) _____ Date & Time of Sampling 12/5/22 :13:30

Platypus
Seen ○
Not seen ✓

Conditions

Waterbody		Weather	
Stream	✓	Sunny	○
Channel	○	Cloudy	✓
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	✓
Estuary	○		
Wetland (Pa)	○	**Flow**	
Wetland (La)	○	No flow	○
Wetland (Es)	○	Flowing	✓

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates
Upstream
-37.635989
145.192204
Downstream
-37.637240
145.191729

Comments
Deep holes stopped survey in some areas.

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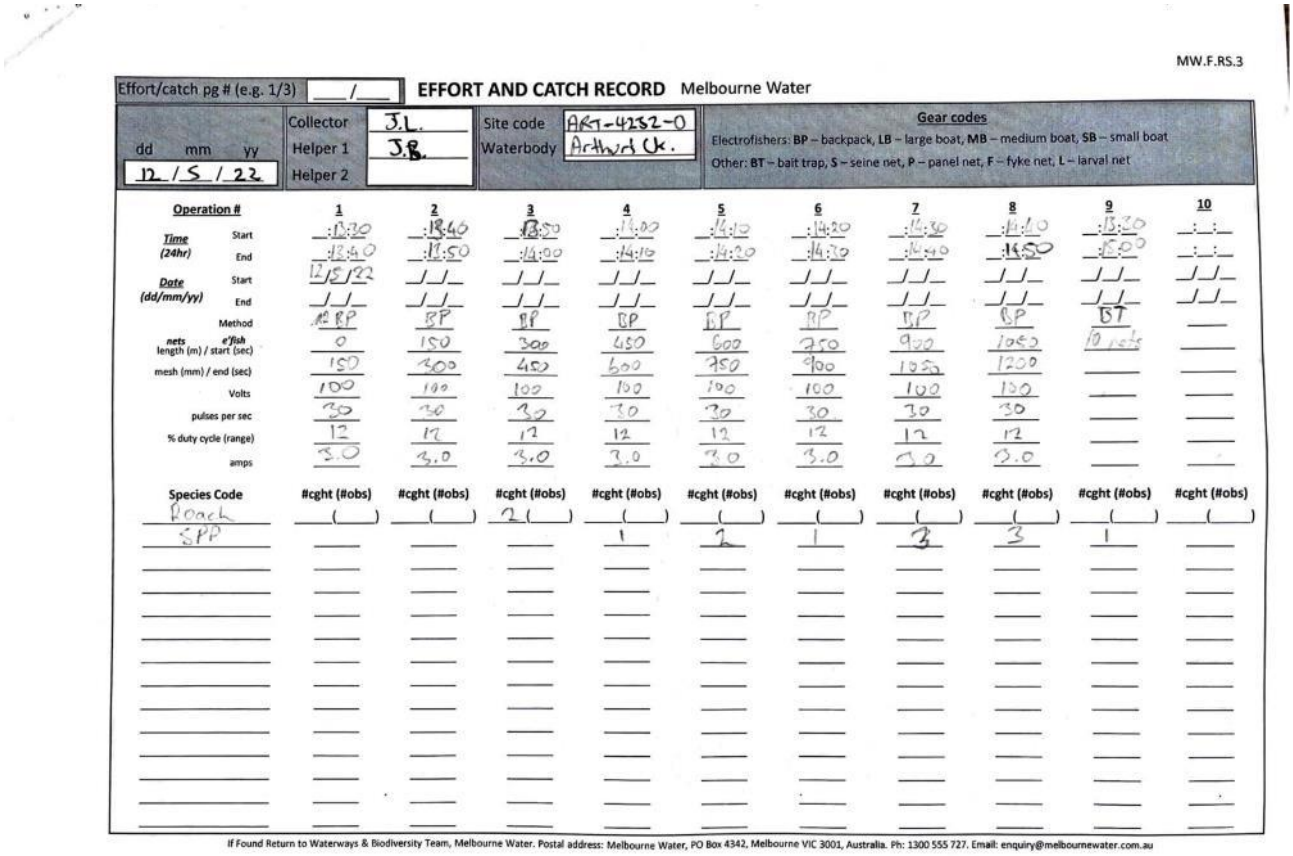

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 12/5/22

Collector: J.L.
Helper 1: J.B.
Helper 2:

Site code: ART-4232-0
Waterbody: Arthurs Ck.

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	:10:30	:13:46	:13:50	:14:00	:14:10	:14:20	:14:30	:14:40	:15:30	:_:_
Time (24hr) End	:12:40	:12:50	:14:00	:14:10	:14:20	:14:30	:14:40	:14:50	:15:00	:_:_
Date (dd/mm/yy) Start	12/5/22	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_
Date (dd/mm/yy) End	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_
Method	BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / e'fish start (sec)	0	150	300	450	600	750	900	1050	10 nets	
mesh (mm) / end (sec)	150	300	450	600	750	900	1050	1200		
Volts	100	100	100	100	100	100	100	100		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	12	12	12	12	12	12	12	12		
amps	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
Roach	( )	( )	2 ( )	( )	( )	( )	( )	( )	( )	( )
SPP				1	2	1	3	3	1	

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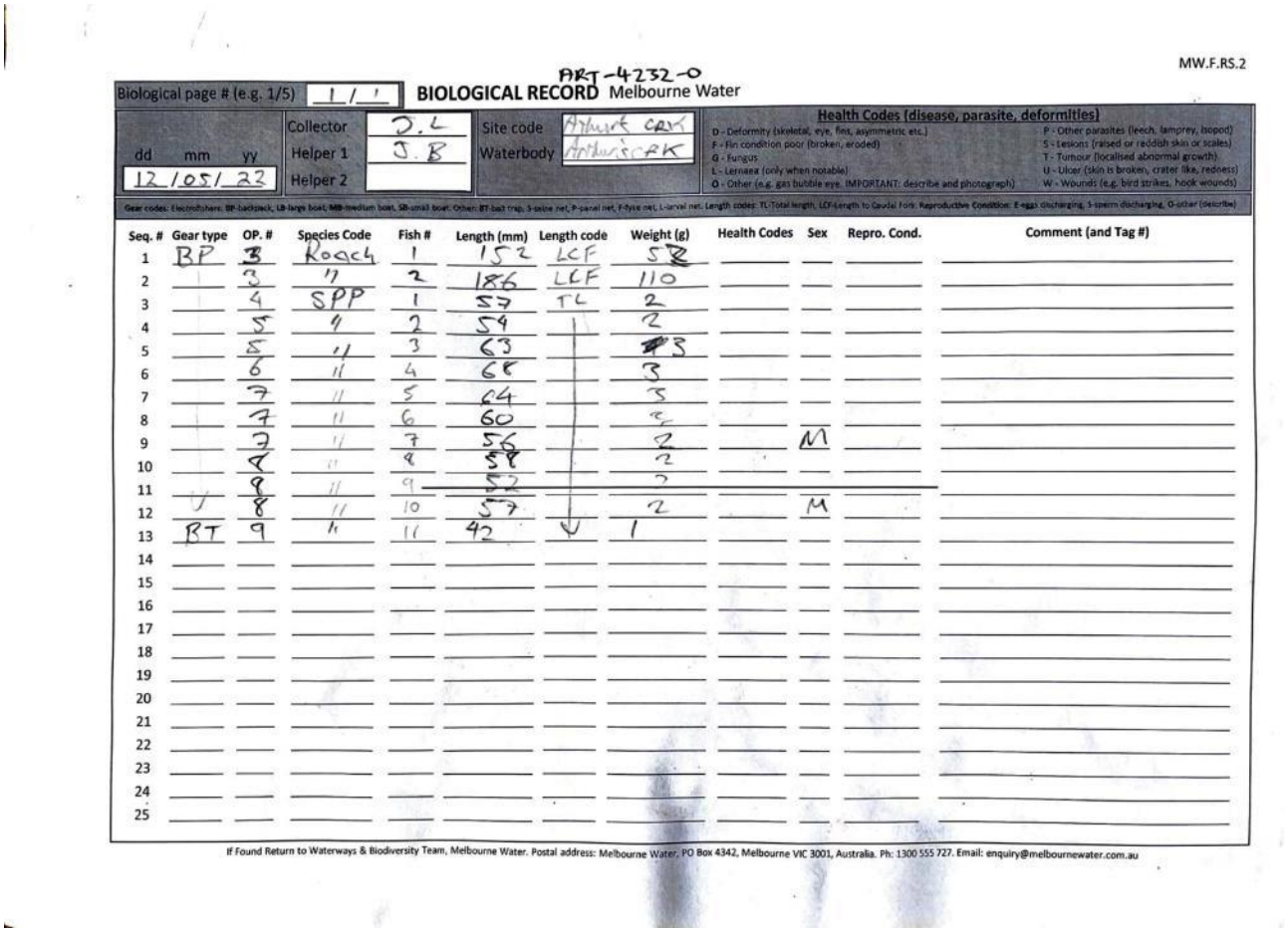

MW.F.RS.2

ART-4232-0

Biological page # (e.g. 1/5) 1/1

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 12/05/22

Collector: D.L

Helper 1: J.B

Helper 2:

Site code: Arthurs Creek

Waterbody: Arthurs Creek

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	3	Rock	1	152	LCF	58				
2		3	"	2	186	LCF	110				
3		4	SPP	1	57	TL	2				
4		5	"	2	54		2				
5		5	"	3	63		3				
6		6	"	4	65		3				
7		7	"	5	64		3				
8		7	"	6	60		2				
9		7	"	7	56		2		M		
10		7	"	8	58		2				
11		8	"	9	52		2				
12	"	8	"	10	57		2		M		
13	BT	9	"	11	42	"	1				
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy: 12 / 5 / 22

Collector: J.L.
Helper 1: J.B.
Helper 2:

Site code: ART-4232-0
Waterbody: Arthur's Ck

Instructions: Mark circles with cross or fill in. Leave boxes blank if the item was not seen. Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	●	●	●	●	●	Bedrock	●	●	●	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	●	●	●	●	●	Gravel (2-60 mm)	●	●	●	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	●	●	●	●	●	Sand (0.6-2 mm)	●	●	●	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	●	●	●	●	●	Mid/silt (0.002-0.6 mm)	●	●	●	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	●	●	●	●	●	Clay (<0.002 mm)	●	●	●	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	●	●	●	Native trees	●	●	●	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	●	●	●	●	●	Native shrubs	●	●	●	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	●	●	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	○	○	○	○	○	Emergent macrophytes	○	●	●	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	○	○	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	Biofilms	●	●	●	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	○	○	○	○	○	Rock	○	○	○	○	○	Rock
Timber	●	●	●	●	●	Timber	●	●	●	○	○	Timber
Undercuts	●	●	●	●	●	Undercuts	●	●	●	○	○	Undercuts
Leaf litter	○	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	○	○	○	○	○	Macrophytes	○	●	●	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	●	○	○	○	○	Pools	●	●	●	○	○	Pools
Run	○	●	●	●	●	Run	○	○	○	○	○	Run
Riffle	○	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	S	M	M	M	M	Velocity (F, M, S, NF)	S	S	S	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	5	3	3	3	3	Average wetted width (m)	4	8	8	___	___	Average width (m)
Average depth (m)	0.8	0.5	0.5	0.5	0.5	Average depth (m)	0.8	0.8	0.6	___	___	Average depth (m)
Distance travelled (m)	15	15	15	15	15	Distance travelled (m)	15	15	15	___	___	Distance travelled (m)

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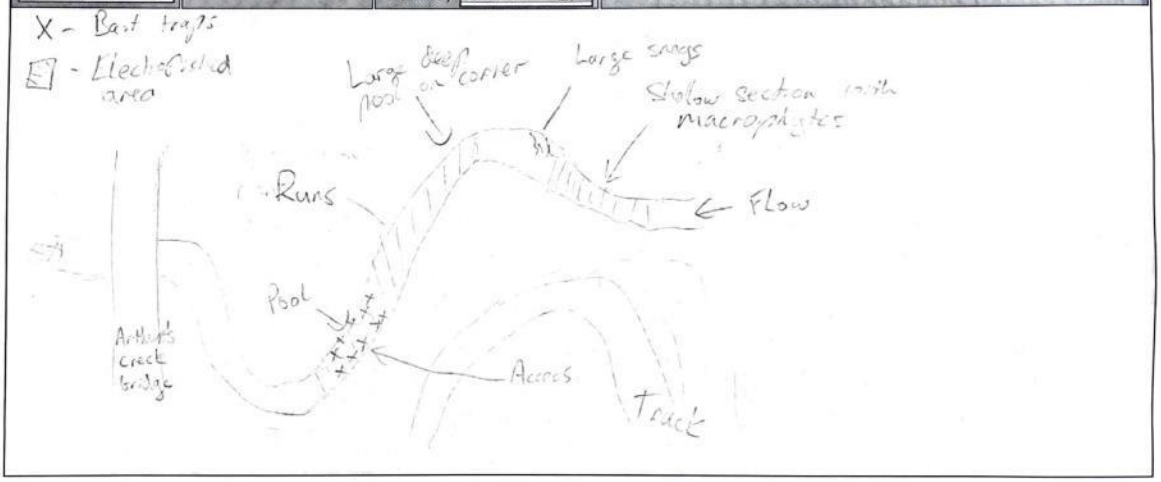
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
12/5/22	J.L.	ART-4232-0	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody Arthur's Ck	



Comments:

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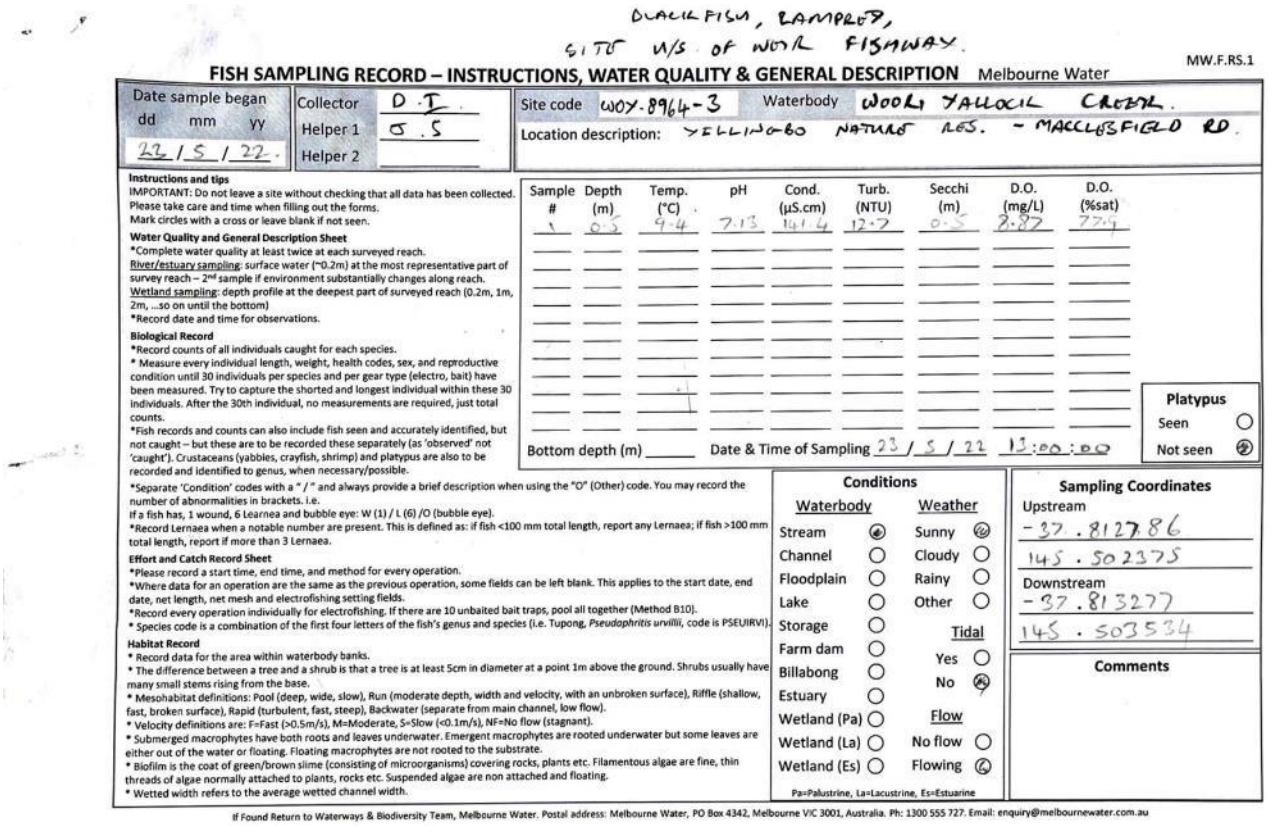

BLACK FISH, LAMPREY, SITE U/S OF WORK FISHWAY.

MW.F.RS.1

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

Date sample began dd mm yy: 22 / 5 / 22

Collector: D.I.
Helper 1: S.S
Helper 2:

Site code: WOY-8964-3 Waterbody: WOORI YALLOCK CREEK.
Location description: YELLINGBO NATURE RES. - MACCLESFIELD RD.

Instructions and tips
IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet
*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record
*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet
*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record
* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.5	9.4	7.13	141.4	12.7	0.5	2.87	77.9

Bottom depth (m) _____ Date & Time of Sampling 23 / 5 / 22 13:00:00

Platypus: Seen ○ Not seen ●

Conditions

Waterbody		Weather	
Stream	●	Sunny	●
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	●
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	●
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates
Upstream
-37.812786
145.502375
Downstream
-37.813277
145.503534

Comments

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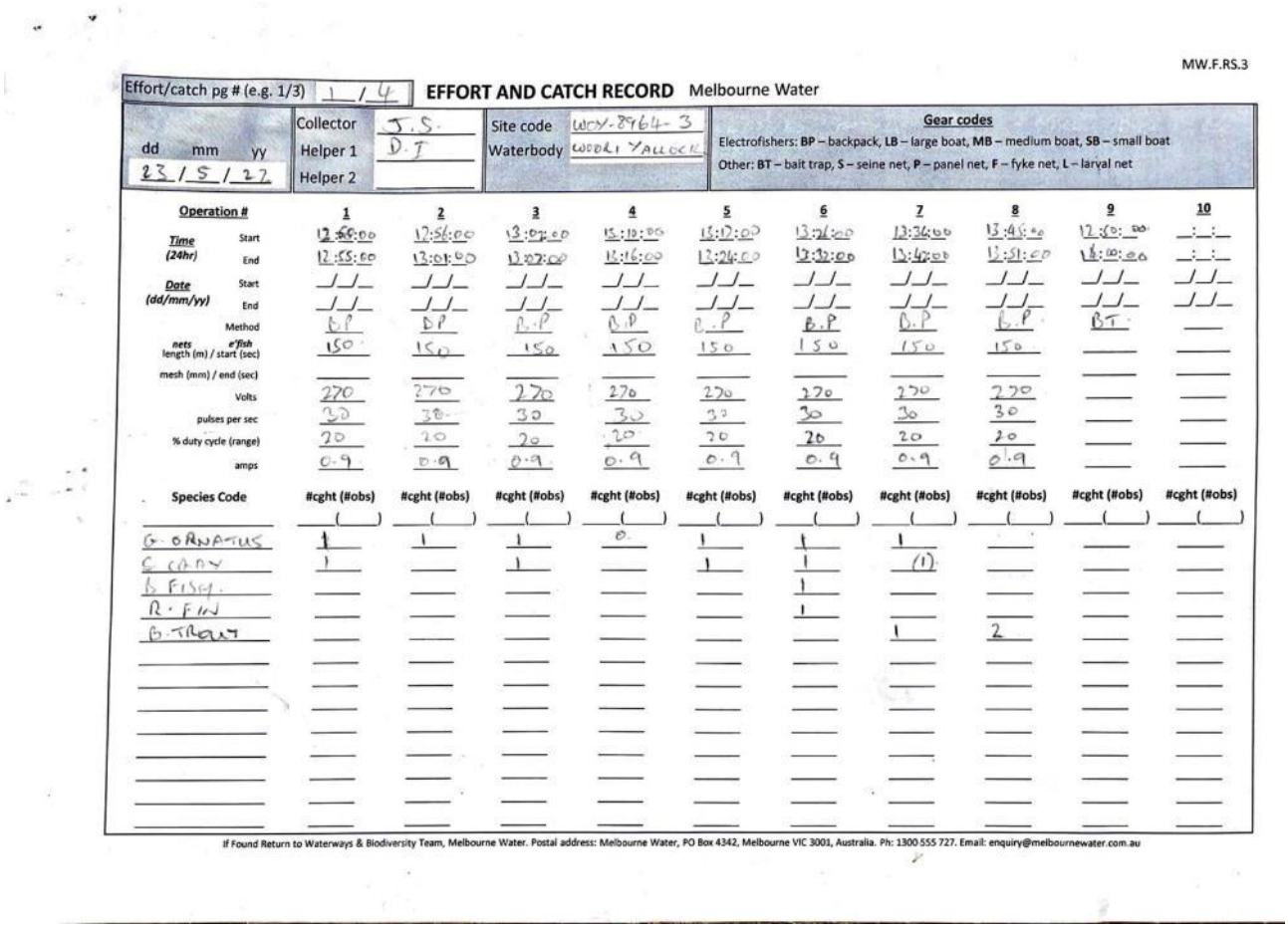

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) 1 / 4

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 23 / 5 / 22

Collector: J.S.
Helper 1: D.T
Helper 2:

Site code: WCY-8964-3
Waterbody: WOORI YALLOCK

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	12:50:00	12:54:00	13:07:00	13:10:00	13:17:00	13:26:00	13:36:00	13:45:00	12:50:00	::
Time (24hr) End	12:55:00	13:01:00	13:07:00	13:16:00	13:24:00	13:32:00	13:42:00	13:51:00	13:00:00	::
Date (dd/mm/yy) Start	//	//	//	//	//	//	//	//	//	//
Date (dd/mm/yy) End	//	//	//	//	//	//	//	//	//	//
Method	B.P	B.P	B.P	B.P	B.P	B.P	B.P	B.P	BT	
nets length (m) / e'fish start (sec)	150	150	150	150	150	150	150	150		
mesh (mm) / end (sec)										
Volts	270	270	270	270	270	270	270	270		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	20	20	20	20	20	20	20	20		
amps	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
G. ORNATUS	1	1	1	0	1	1	1			
E. CANY	1		1		1	1	(1)			
B. FISH.						1				
R. FIN						1				
G. TREAT							1	2		

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MW.F.RS.4

Habitat page # (e.g. 1/3) 2/4

HABITAT RECORD Melbourne Water

dd mm yy: 23/5/22

Collector: J.S

Helper 1: D.T

Helper 2:

Site code: WOY-8964.3

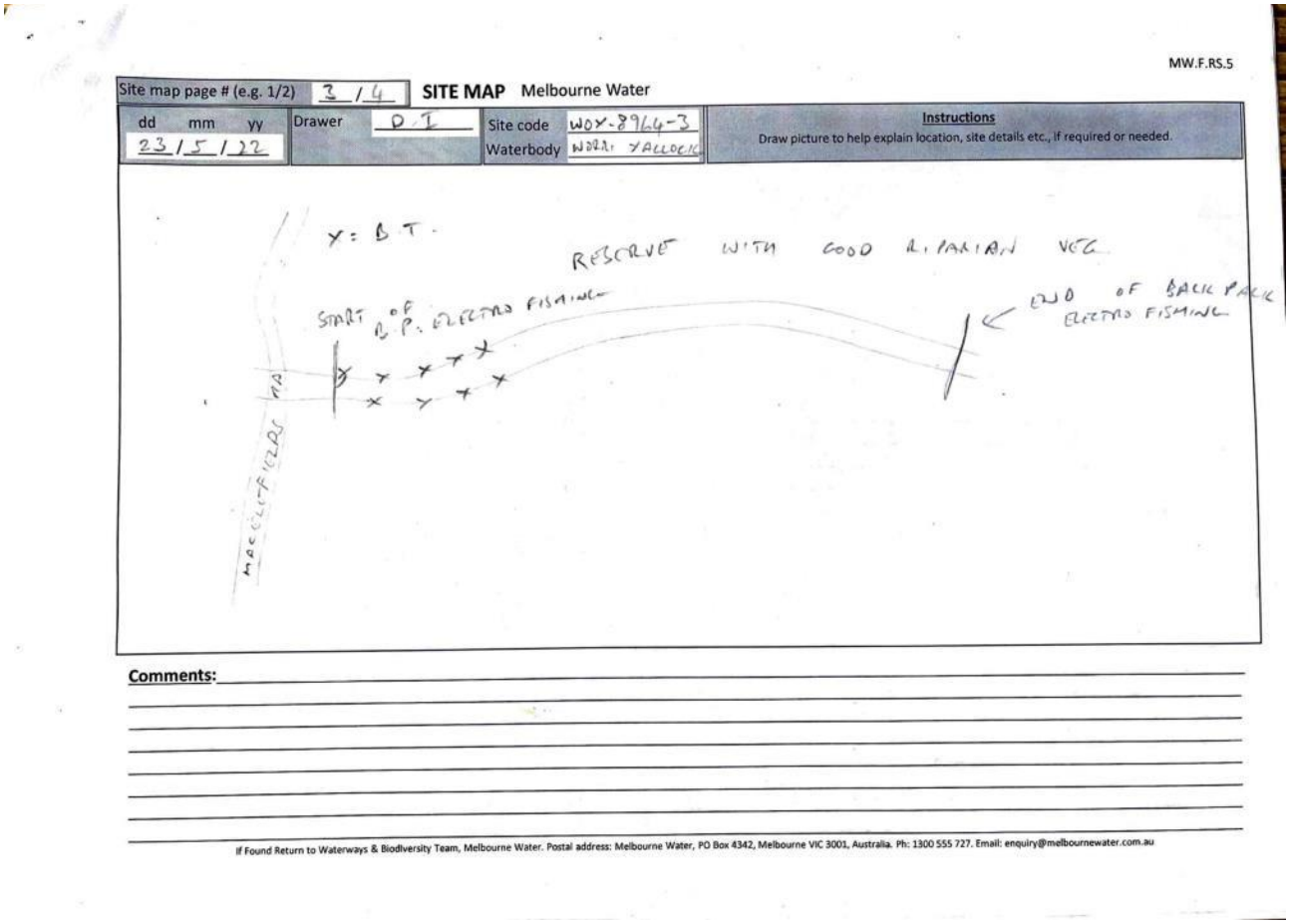
Waterbody: WOARI YALLOCK

Instructions

Mark circles with cross or fill in. Leave boxes blank if the item was not seen. Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	●	●	●	●	●	Mid/silt (0.002-0.6 mm)	●	●	●	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	●	●	●	●	●	Clay (<0.002 mm)	●	●	●	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	●	●	●	Native trees	●	●	●	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	●	●	●	●	●	Native shrubs	●	●	●	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	●	●	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	○	○	○	○	○	Emergent macrophytes	○	○	○	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	●	Submerged macrophytes	●	●	●	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	○	○	○	○	○	Biofilms	○	○	○	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	○	○	○	○	○	Rock	○	○	○	○	○	Rock
Timber	●	●	●	●	●	Timber	●	●	●	○	○	Timber
Undercuts	●	●	●	●	●	Undercuts	●	●	●	○	○	Undercuts
Leaf litter	●	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	○	○	○	○	○	Macrophytes	○	○	○	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	○	○	○	○	○	Pools	○	●	○	○	○	Pools
Run	●	●	●	●	●	Run	●	●	●	○	○	Run
Riffle	○	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	S	S	S	S	S	Velocity (F, M, S, NF)	S	S	S	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	4	4	5	5	5	Average wetted width (m)	5	5	5	___	___	Average width (m)
Average depth (m)	0.6	0.6	0.7	0.7	0.7	Average depth (m)	0.7	0.9	0.7	___	___	Average depth (m)
Distance travelled (m)	25	25	25	20	25	Distance travelled (m)	20	25	25	___	___	Distance travelled (m)

If Found Return to Waterways & Biodiversity Team, Melbourne Water. Postal address: Melbourne Water, PO Box 4342, Melbourne VIC 3001, Australia. Ph: 1300 555 727. Email: enquiry@melbournewater.com.au



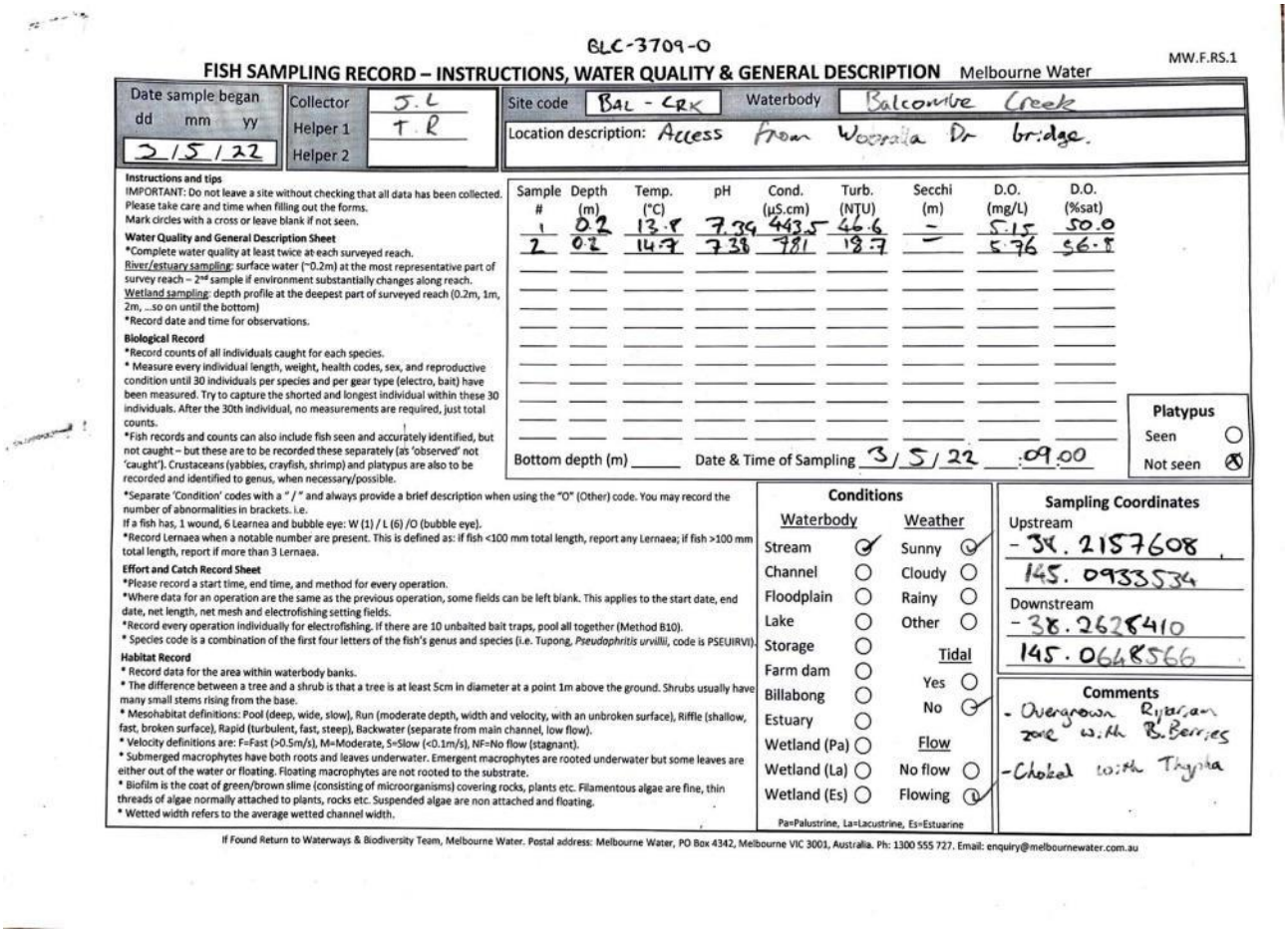
MW.F.RS.5

Site map page # (e.g. 1/2) 3 / 4 **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
23 / 5 / 22	D I	WOY-8964-3	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody WARR: YALLOCK	

Comments:

If Found Return to Waterways & Biodiversity Team, Melbourne Water. Postal address: Melbourne Water, PO Box 4342, Melbourne VIC 3001, Australia. Ph: 1300 555 727. Email: enquiry@melbournewater.com.au



BLC-3709-0

MW.F.RS.1

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

Date sample began dd mm yy: 2/5/22

Collector: J.L

Helper 1: T.R

Helper 2:

Site code: BAL - CRK

Waterbody: Balcombe Creek

Location description: Access from Woorala Dr bridge.

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected. Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudophritis urvillii*, code is PSEUURVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	13.8	7.39	443.5	46.6	–	5.15	50.0
2	0.2	14.7	7.38	481	18.7	–	5.76	56.8

Bottom depth (m) _____ Date & Time of Sampling 3/5/22 :09:00

Platypus
Seen ○
Not seen ⊗

Conditions

Waterbody		Weather	
Stream	✓	Sunny	✓
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	✓
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	✓
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-38.2157608
145.0933534
Downstream
-38.2628410
145.0648566

Comments

- Overgrown Riparian zone with B.Berries
- Choked with Typha

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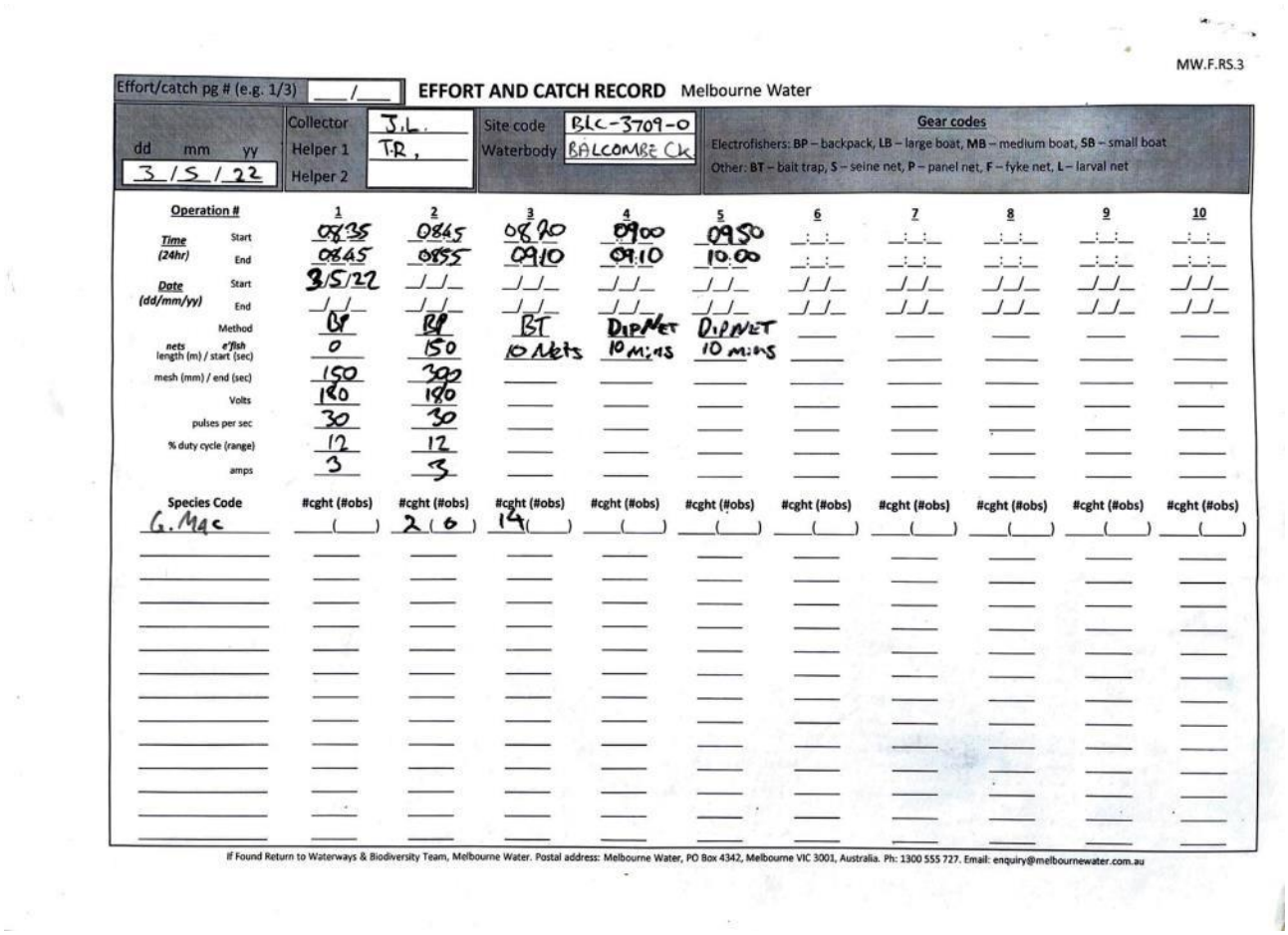

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___ **EFFORT AND CATCH RECORD** Melbourne Water

dd mm yy: 3/5/22

Collector: J.L.
Helper 1: T.R.
Helper 2:

Site code: BLC-3709-0
Waterbody: BALCOMBE Ck

Gear codes
Electrofishers: BP – backpack, LB – large boat, MB – medium boat, SB – small boat
Other: BT – bait trap, S – seine net, P – panel net, F – fyke net, L – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	0835	0845	0840	0900	0950	__:__	__:__	__:__	__:__	__:__
Time (24hr) End	0845	0855	0910	0910	1000	__:__	__:__	__:__	__:__	__:__
Date (dd/mm/yy) Start	3/5/22	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__
Date (dd/mm/yy) End	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__
Method	BP	BP	BT	DIPNET	DIPNET					
nets length (m) / efish start (sec)	0	150	10 Nets	10 mins	10 mins					
mesh (mm) / end (sec)	150	390								
Volts	180	190								
pulses per sec	30	30								
% duty cycle (range)	12	12								
amps	3	3								
Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
G.Mac	___(___)	2(6)	14(___)	___(___)	___(___)	___(___)	___(___)	___(___)	___(___)	___(___)

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MW.F.RS.2

RLC-3709-0

Biological page # (e.g. 1/5) 1 / 1

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 03 / 05 / 22

Collector: S.L
Helper 1: T.R
Helper 2:

Site code: BAL-CRK
Waterbody: Balcombe Creek

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye, IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	2	G.Mac	1	122	TL	16				
2	BP	2	G.Mac	2	131	TL	18				
3	BT	3(1)	G.Mac	3	84	TL	3				
4	BT	3(1)		4	139	TL	22				
5	BT	3(2)		5	57	TL	3				
6	BT	3(3)		6	109	TL	14				
7	BT	3(3)		7	83	TL	9				
8	BT	3(3)		8	66	TL	6				
9	BT	3(3)		9	106	TL	11				
10	BT	3(4)		10	88	TL	8				
11	BT	3(5)		11	84	TL	7				
12	BT	3(6)		12	79	TL	7				
13	BT	3(6)		13	91	TL	8				
14	BT	3(6)		14	76	TL	-				
15	BT	3(7)		15	58	TL	-				
16	BT	3(8)		16	63	TL	-				
17	BT	3(8)		17	60	TL	-				
18											
19											
20											
21											
22											
23											
24											
25											

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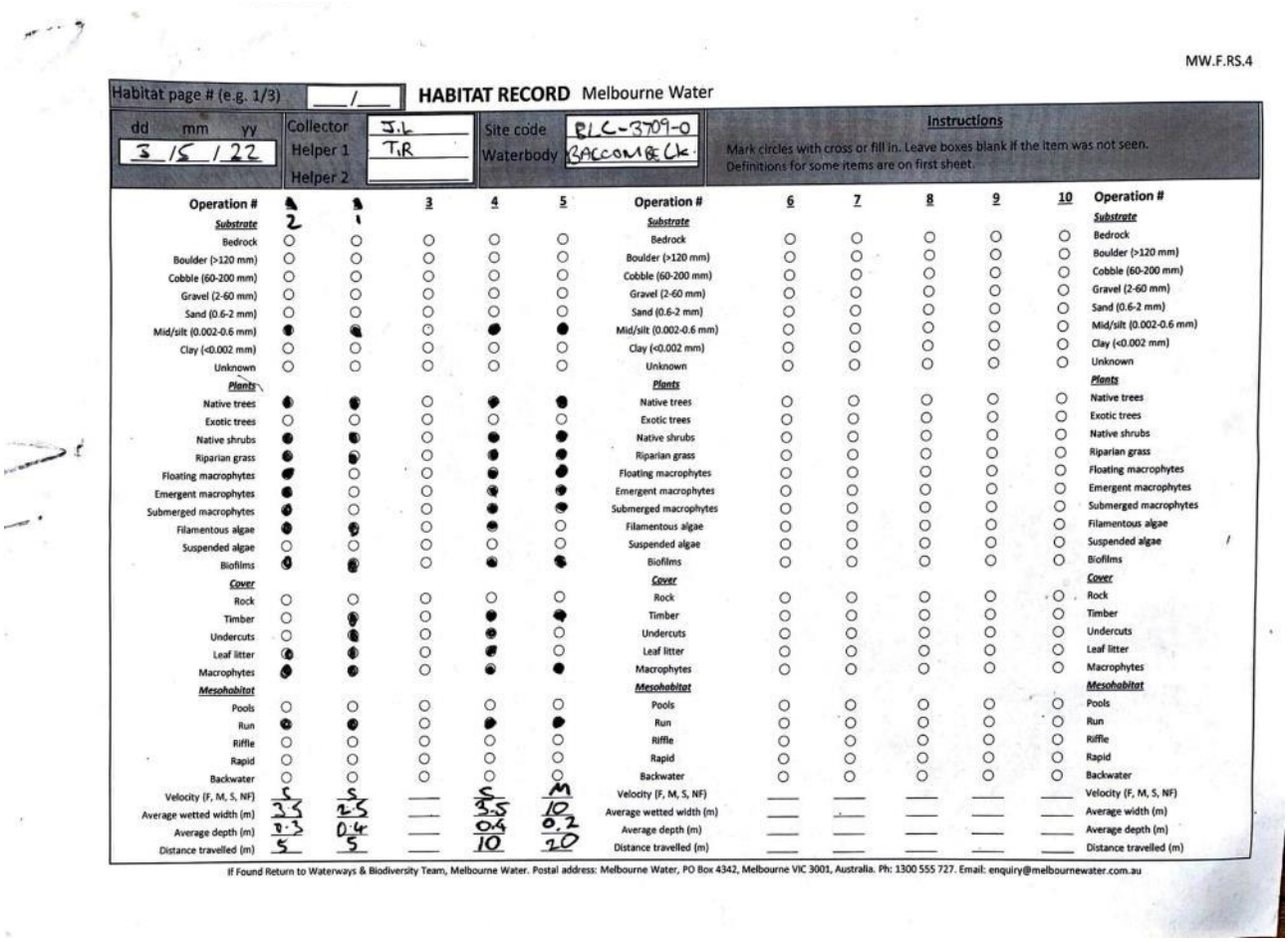

MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy: 3/5/22

Collector: J.L

Helper 1: T.R

Helper 2:

Site code: BLC-3709-0

Waterbody: BACCOMBE Ck

Instructions

Mark circles with cross or fill in. Leave boxes blank if the item was not seen. Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	6	7	8	9	10	Operation #
Substrate	2	1									***Substrate***
Bedrock	○	○	○	○	○	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	○	○	○	○	○	○	○	○	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	●	●	○	●	●	○	○	○	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	○	○	○	○	○	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	○	○	○	○	○	Unknown
Plants											***Plants***
Native trees	●	●	○	●	●	○	○	○	○	○	Native trees
Exotic trees	○	○	○	○	○	○	○	○	○	○	Exotic trees
Native shrubs	●	●	○	●	●	○	○	○	○	○	Native shrubs
Riparian grass	●	●	○	●	●	○	○	○	○	○	Riparian grass
Floating macrophytes	●	○	○	●	●	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	●	○	○	●	●	○	○	○	○	○	Emergent macrophytes
Submerged macrophytes	●	○	○	●	●	○	○	○	○	○	Submerged macrophytes
Filamentous algae	●	●	○	●	○	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	○	○	○	○	○	Suspended algae
Biofilms	●	●	○	●	●	○	○	○	○	○	Biofilms
Cover											***Cover***
Rock	○	○	○	○	○	○	○	○	○	○	Rock
Timber	○	●	○	●	●	○	○	○	○	○	Timber
Undercuts	○	●	○	●	○	○	○	○	○	○	Undercuts
Leaf litter	●	●	○	●	○	○	○	○	○	○	Leaf litter
Macrophytes	●	●	○	●	●	○	○	○	○	○	Macrophytes
Mesohabitat											***Mesohabitat***
Pools	○	○	○	○	○	○	○	○	○	○	Pools
Run	●	●	○	●	●	○	○	○	○	○	Run
Riffle	○	○	○	○	○	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	S	S	___	S	M	___	___	___	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	2.3	2.5	___	3.5	10	___	___	___	___	___	Average width (m)
Average depth (m)	0.3	0.4	___	0.4	0.2	___	___	___	___	___	Average depth (m)
Distance travelled (m)	5	5	___	10	20	___	___	___	___	___	Distance travelled (m)

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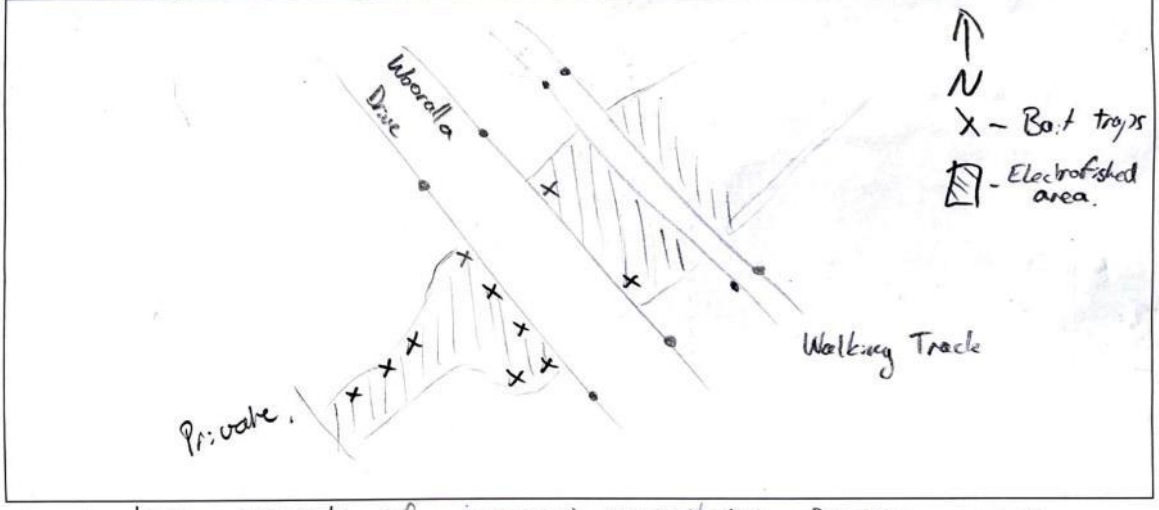
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy: 3/5/22 | Drawer: JL | Site code: BLC-3709-0 | Waterbody: BALCOMBE Ck

Instructions
Draw picture to help explain location, site details etc., if required or needed.



Comments: Large amounts of emergent macrophytes stopping progress upstream. Blackberries also made access impossible upstream

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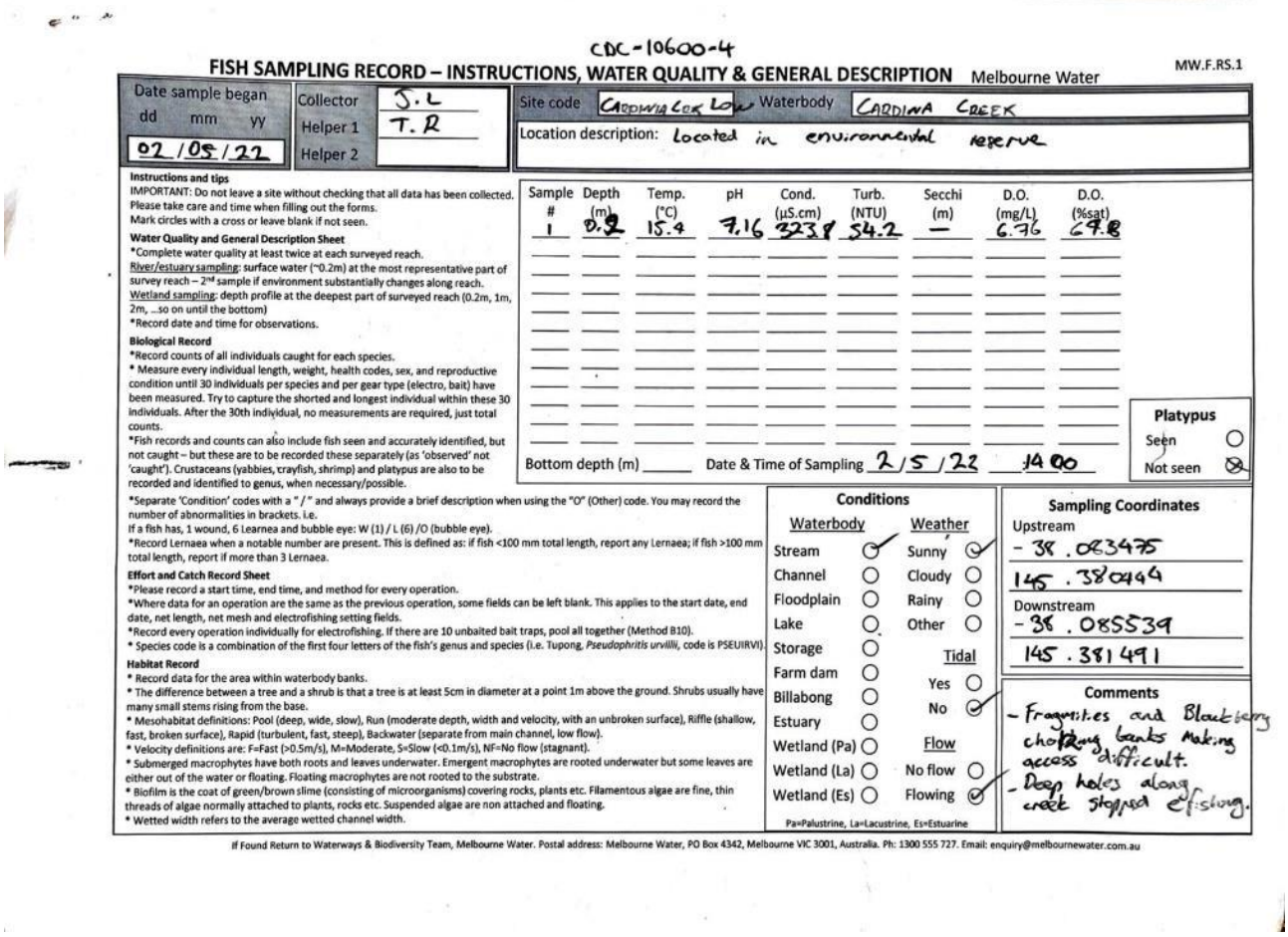

CDC-10600-4

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

MW.F.RS.1

Date sample began dd mm yy	Collector	Site code	Waterbody
02 / 05 / 22	J. L	CARDINIA CREEK LOW	CARDINIA CREEK
	Helper 1 T. R	Location description: Located in environmental reserve	
	Helper 2		

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	15.4	7.16	323.9	54.2	—	6.76	69.8

Bottom depth (m) _____ Date & Time of Sampling 2 / 5 / 22 1400

Platypus: Seen ○ Not seen ⊗

*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudophritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Conditions

Waterbody		Weather	
Stream	✓	Sunny	✓
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	✓
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	✓
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-38.083475
145.380494
Downstream
-38.085539
145.381491

Comments

- Fragmites and Blackberry choking banks making access difficult.
- Deep holes along creek stopped efishing.

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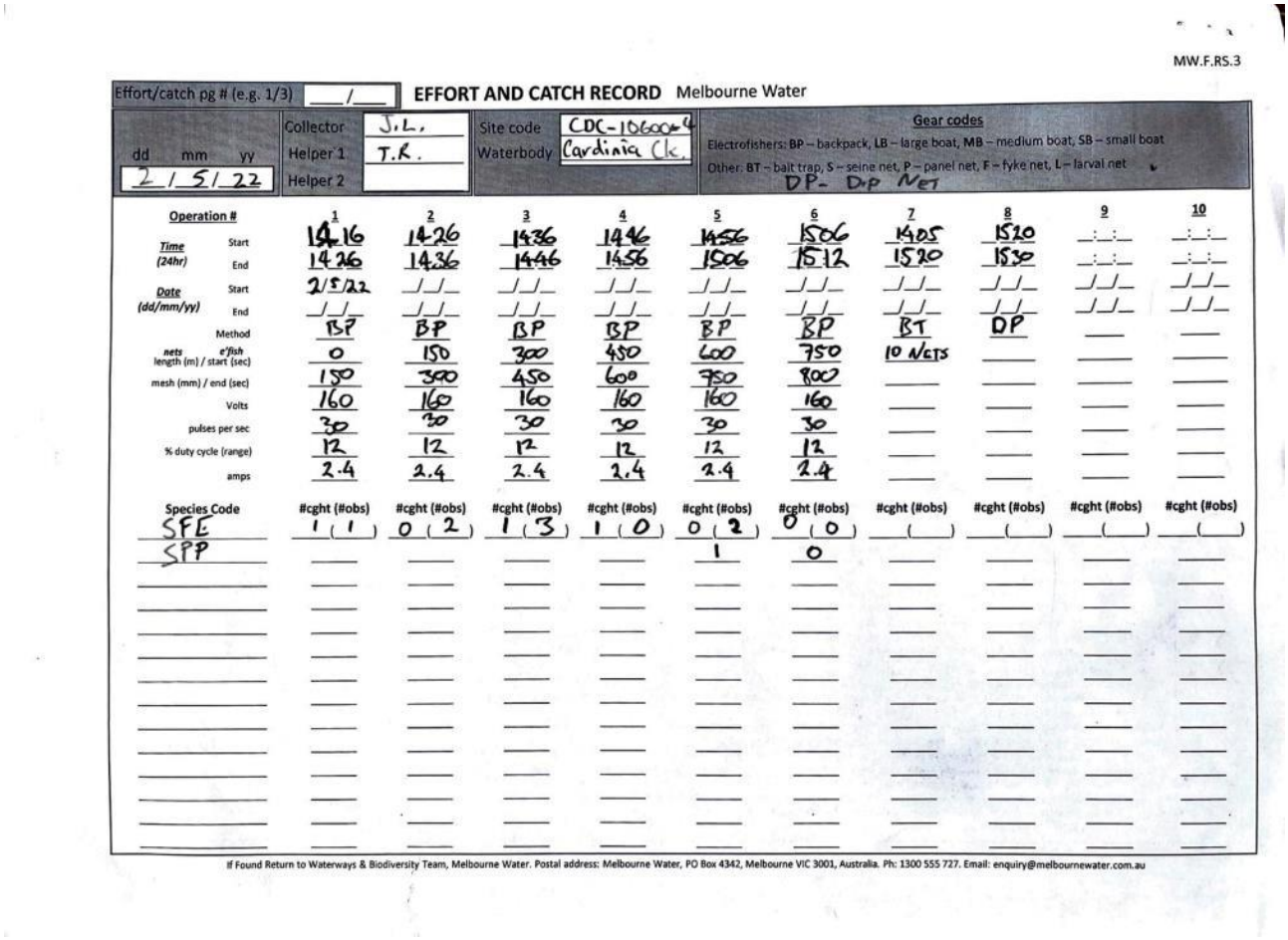

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 2 / 5 / 22

Collector: J.L.
Helper 1: T.R.
Helper 2:

Site code: CDC-10600-4
Waterbody: Cardinia Ck.

Gear codes
Electrofishers: BP – backpack, LB – large boat, MB – medium boat, SB – small boat
Other: BT – bait trap, S – seine net, P – panel net, F – fyke net, L – larval net
DP- Dip Net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	14:16	1426	1436	1446	1456	1506	1405	1520	_:_	_:_
Time (24hr) End	1426	1436	1446	1456	1506	1512	1520	1530	_:_	_:_
Date (dd/mm/yy) Start	2/5/22	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_
Date (dd/mm/yy) End	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_
Method	BP	BP	BP	BP	BP	BP	BT	DP	___	___
nets e'fish length (m) / start (sec)	0	150	300	450	600	750	10 NETS	___	___	___
mesh (mm) / end (sec)	150	300	450	600	750	800	___	___	___	___
Volts	160	160	160	160	160	160	___	___	___	___
pulses per sec	30	30	30	30	30	30	___	___	___	___
% duty cycle (range)	12	12	12	12	12	12	___	___	___	___
amps	2.4	2.4	2.4	2.4	2.4	2.4	___	___	___	___
Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
SFE	1 (1)	0 (2)	1 (3)	1 (0)	0 (2)	0 (0)	( )	( )	( )	( )
SPP	___	___	___	___	1	0	___	___	___	___

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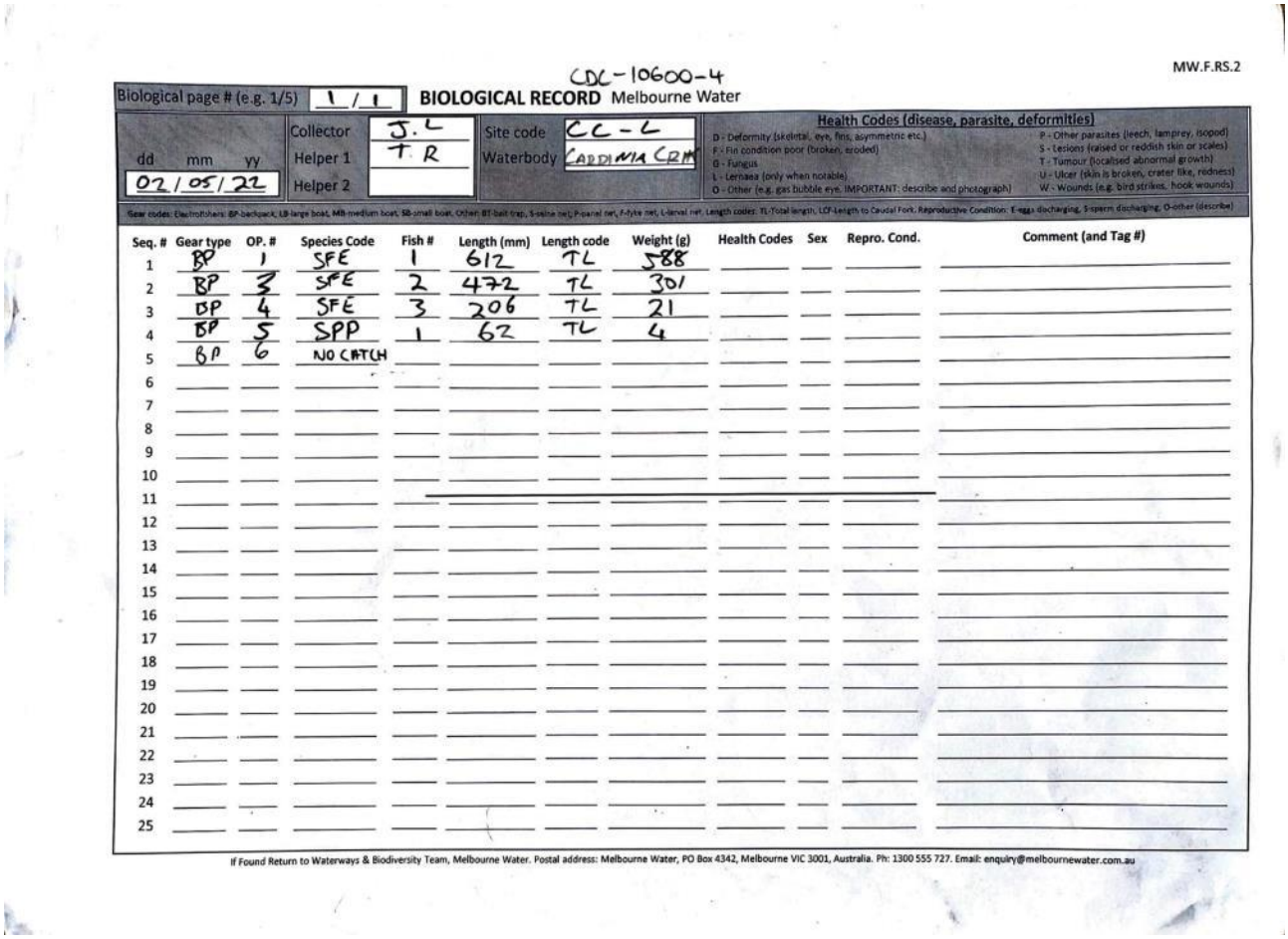

CDC-10600-4

MW.F.RS.2

Biological page # (e.g. 1/5) 1/1 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 02/05/22

Collector: J.L
Helper 1: T.R
Helper 2:

Site code: CC-L
Waterbody: CARDINIA CRK

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-pipnal net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	SFE	1	612	TL	588				
2	BP	3	SFE	2	472	TL	301				
3	BP	4	SFE	3	206	TL	21				
4	BP	5	SPP	1	62	TL	4				
5	BP	6	NO CATCH								
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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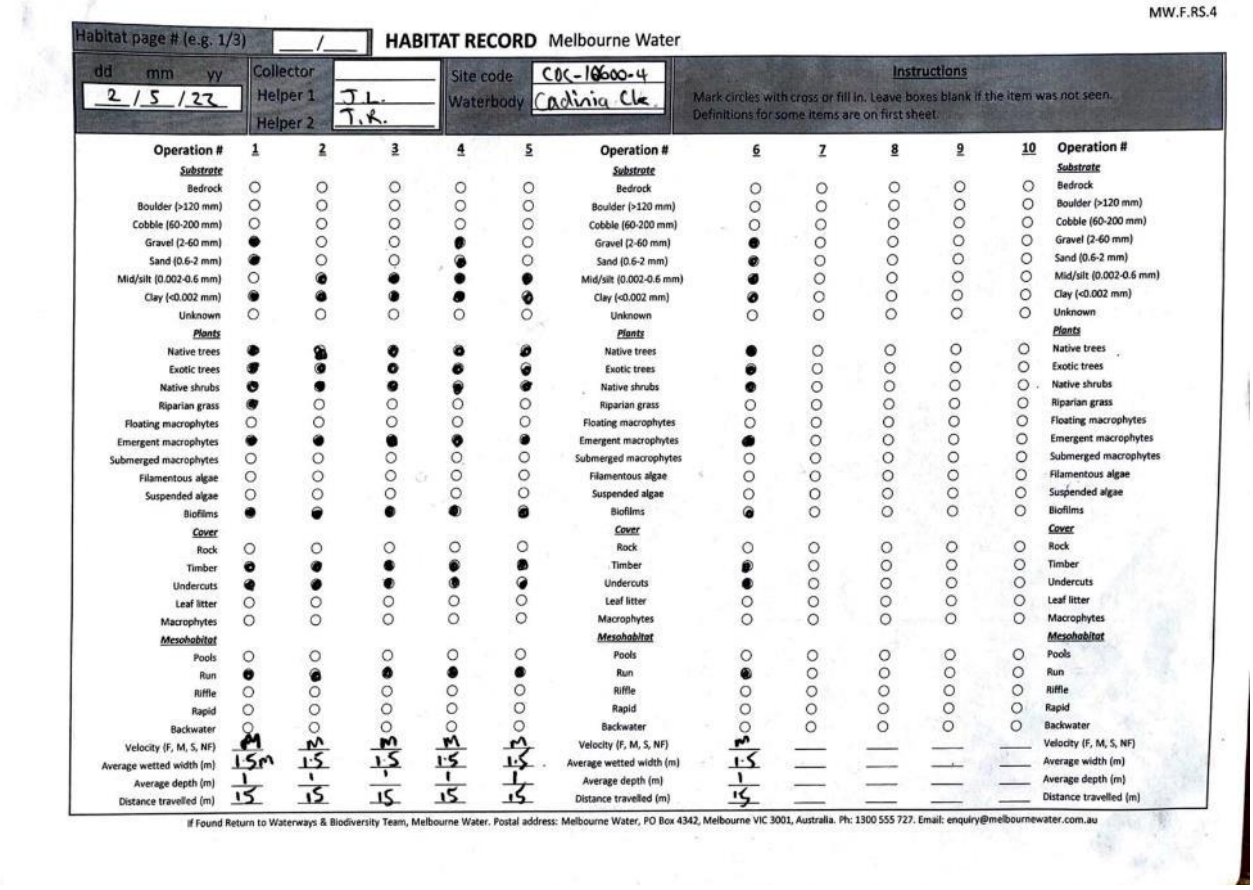

MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy: 2/5/22

Collector: J.L.

Helper 1: T.R.

Helper 2:

Site code: COC-10600-4

Waterbody: Cardinia Cke

Instructions: Mark circles with cross or fill in. Leave boxes blank if the item was not seen. Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	●	○	○	●	○	Gravel (2-60 mm)	●	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	●	○	○	●	○	Sand (0.6-2 mm)	●	○	○	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	○	●	●	●	●	Mid/silt (0.002-0.6 mm)	●	○	○	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	●	●	●	●	●	Clay (<0.002 mm)	●	○	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	●	●	●	Native trees	●	○	○	○	○	Native trees
Exotic trees	●	●	●	●	●	Exotic trees	●	○	○	○	○	Exotic trees
Native shrubs	●	●	●	●	●	Native shrubs	●	○	○	○	○	Native shrubs
Riparian grass	●	○	○	○	○	Riparian grass	○	○	○	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	●	●	●	●	●	Emergent macrophytes	●	○	○	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	○	○	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	Biofilms	●	○	○	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	○	○	○	○	○	Rock	○	○	○	○	○	Rock
Timber	●	●	●	●	●	Timber	●	○	○	○	○	Timber
Undercuts	●	●	●	●	●	Undercuts	●	○	○	○	○	Undercuts
Leaf litter	○	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	○	○	○	○	○	Macrophytes	○	○	○	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	○	○	○	○	○	Pools	○	○	○	○	○	Pools
Run	●	●	●	●	●	Run	●	○	○	○	○	Run
Riffle	○	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	M	M	M	M	M	Velocity (F, M, S, NF)	M	___	___	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	1.5M	1.5	1.5	1.5	1.5	Average wetted width (m)	1.5	___	___	___	___	Average width (m)
Average depth (m)	1	1	1	1	1	Average depth (m)	1	___	___	___	___	Average depth (m)
Distance travelled (m)	15	15	15	15	15	Distance travelled (m)	15	___	___	___	___	Distance travelled (m)

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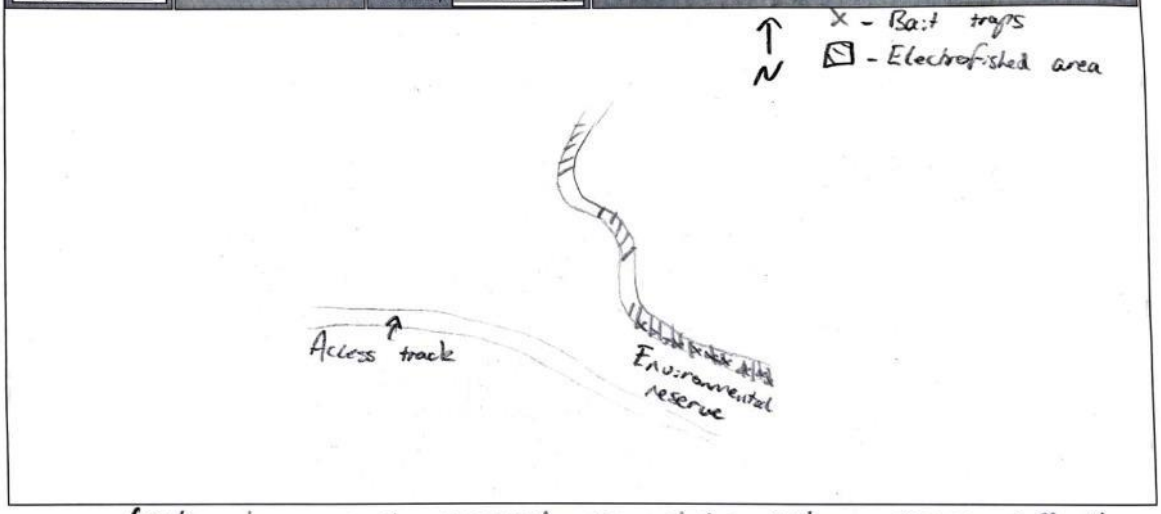
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy: 02/5/22 | Drawer: | Site code: CDC-16600-4 | Waterbody: Cardinia Ck

Instructions
Draw picture to help explain location, site details etc., if required or needed.



Comments: Creek heavy with emergent macrophytes making access difficult. Also deep pools and large blackberry thickets. Large snags stop further progress upstream

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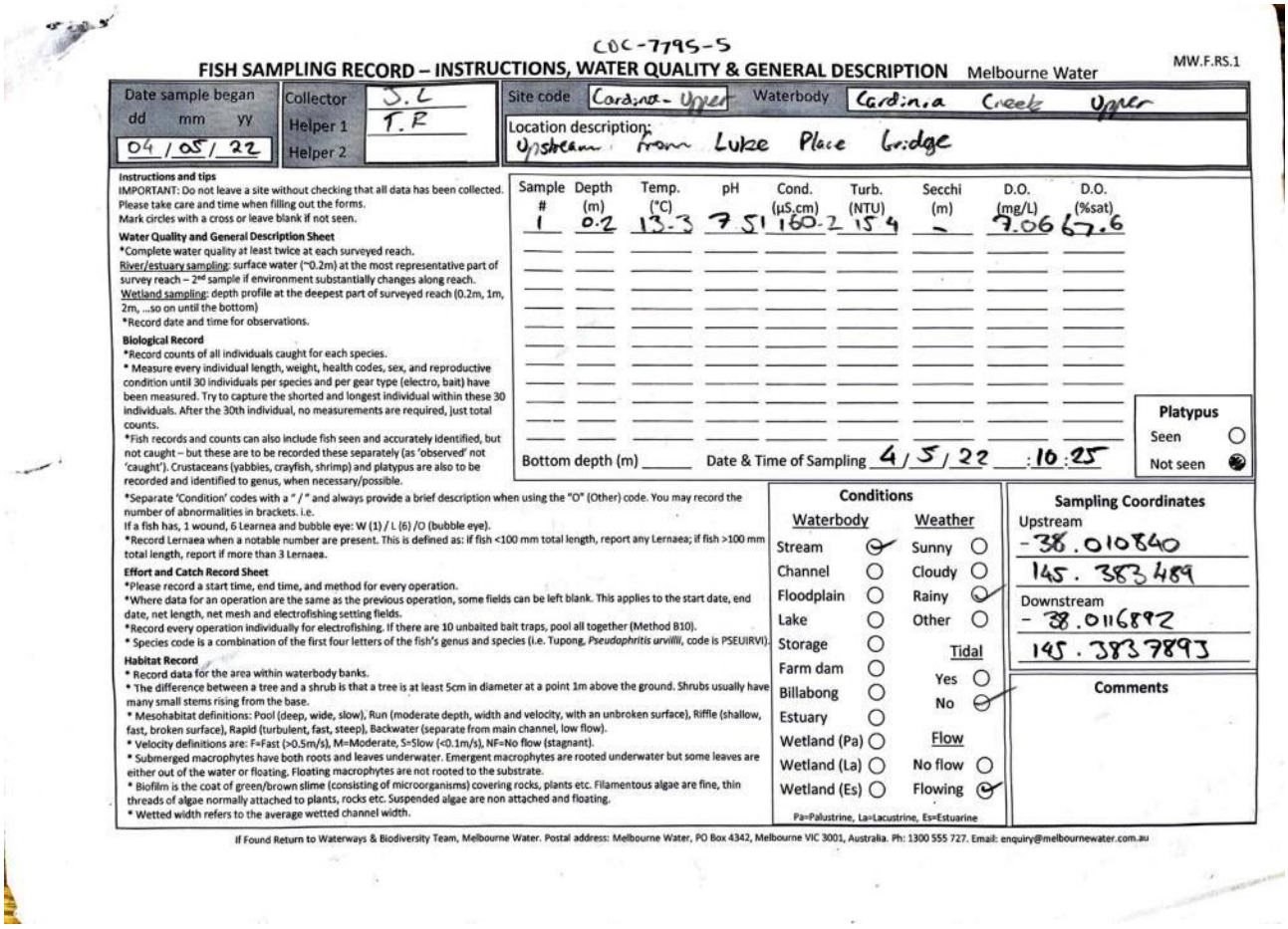

COC-7795-5

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

MW.F.RS.1

Date sample began dd mm yy: 04 / 05 / 22

Collector: J.L

Helper 1: T.R

Helper 2:

Site code: Cardinia - Upper

Waterbody: Cardinia Creek Upper

Location description: Upstream from Lake Place bridge

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUURVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	13.3	7.51	160.2	15.4	-	9.06	67.6

Bottom depth (m) _____ Date & Time of Sampling 4 / 5 / 22 : 10 : 25

Platypus
Seen ○
Not seen ●

Conditions

Waterbody		Weather	
Stream	✓	Sunny	○
Channel	○	Cloudy	○
Floodplain	○	Rainy	✓
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	✓
Estuary	○		
Wetland (Pa)	○	**Flow**	
Wetland (La)	○	No flow	○
Wetland (Es)	○	Flowing	✓

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-38.010840
145.383489
Downstream
-38.011689?
145.383793

Comments

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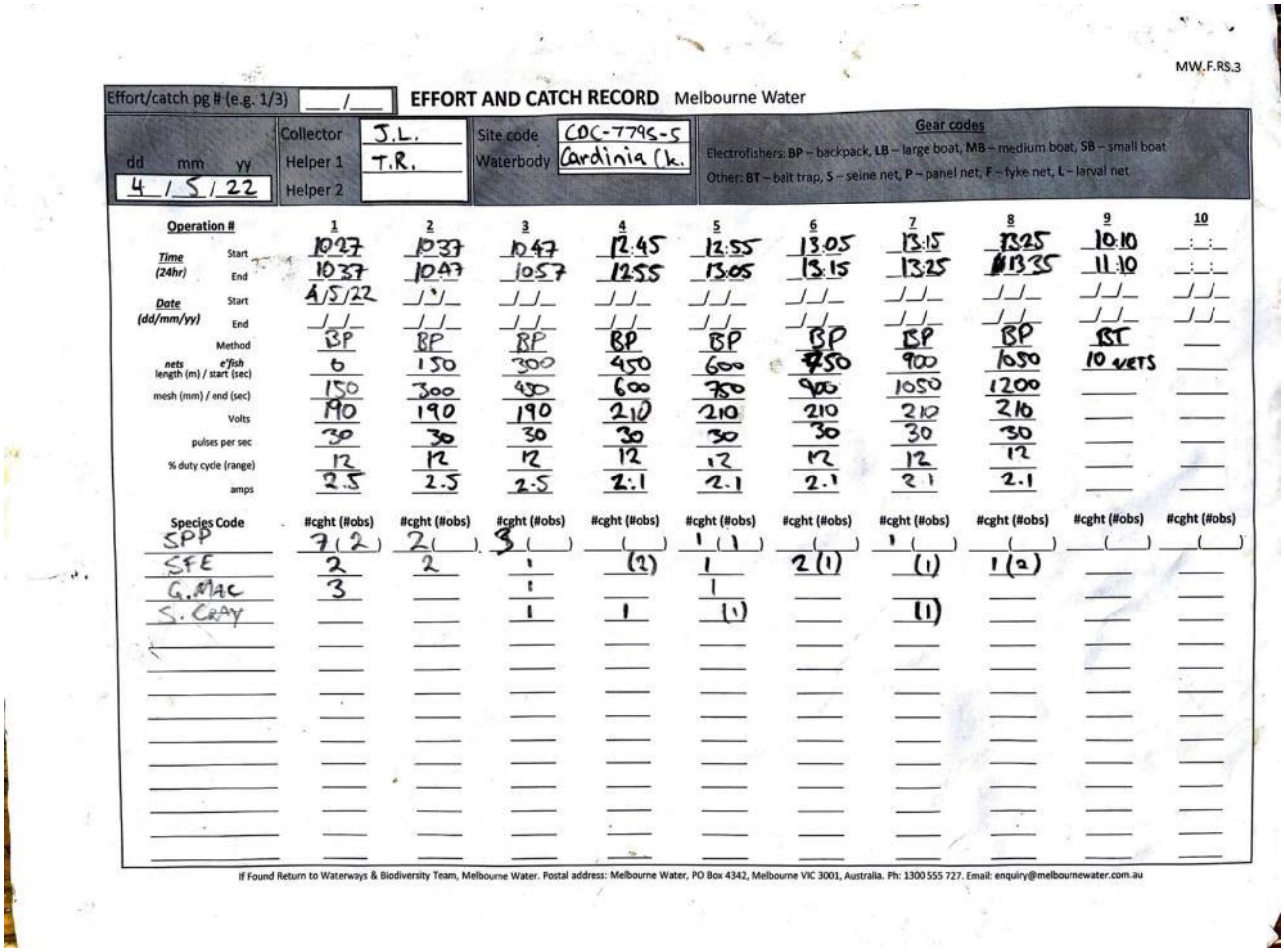

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 4 / 5 / 22

Collector: J.L.
Helper 1: T.R.
Helper 2:

Site code: COC-7795-5
Waterbody: Cardinia (k.

Gear codes
Electrofishers: BP – backpack, LB – large boat, MB – medium boat, SB – small boat
Other: BT – bait trap, S – seine net, P – panel net, F – fyke net, L – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	1027	1037	1047	12:45	12:55	13:05	13:15	13:25	10:10	::
Time (24hr) End	1037	1047	1057	1255	13:05	13:15	13:25	13:35	11:10	::
Date (dd/mm/yy) Start	4/5/22	//	//	//	//	//	//	//	//	//
Date (dd/mm/yy) End	//	//	//	//	//	//	//	//	//	//
Method	BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / e'fish start (sec)	6	150	300	450	600	750	900	1050	10 NETS	
mesh (mm) / end (sec)	150	300	450	600	750	900	1050	1200		
Volts	190	190	190	210	210	210	210	210		
pulses per sec	30	30	30	30	30	30	30	30		
% duty cycle (range)	12	12	12	12	12	12	12	12		
amps	2.5	2.5	2.5	2.1	2.1	2.1	2.1	2.1		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
SPP	7 (2)	2 (__)	3 (__)	(__)	1 (1)	(__)	1 (__)	(__)	(__)	(__)
SFE	2	2	1	(2)	1	2 (1)	(1)	1 (2)		
G.MAC	3		1		1					
S. CRAY			1	1	(1)		(1)			

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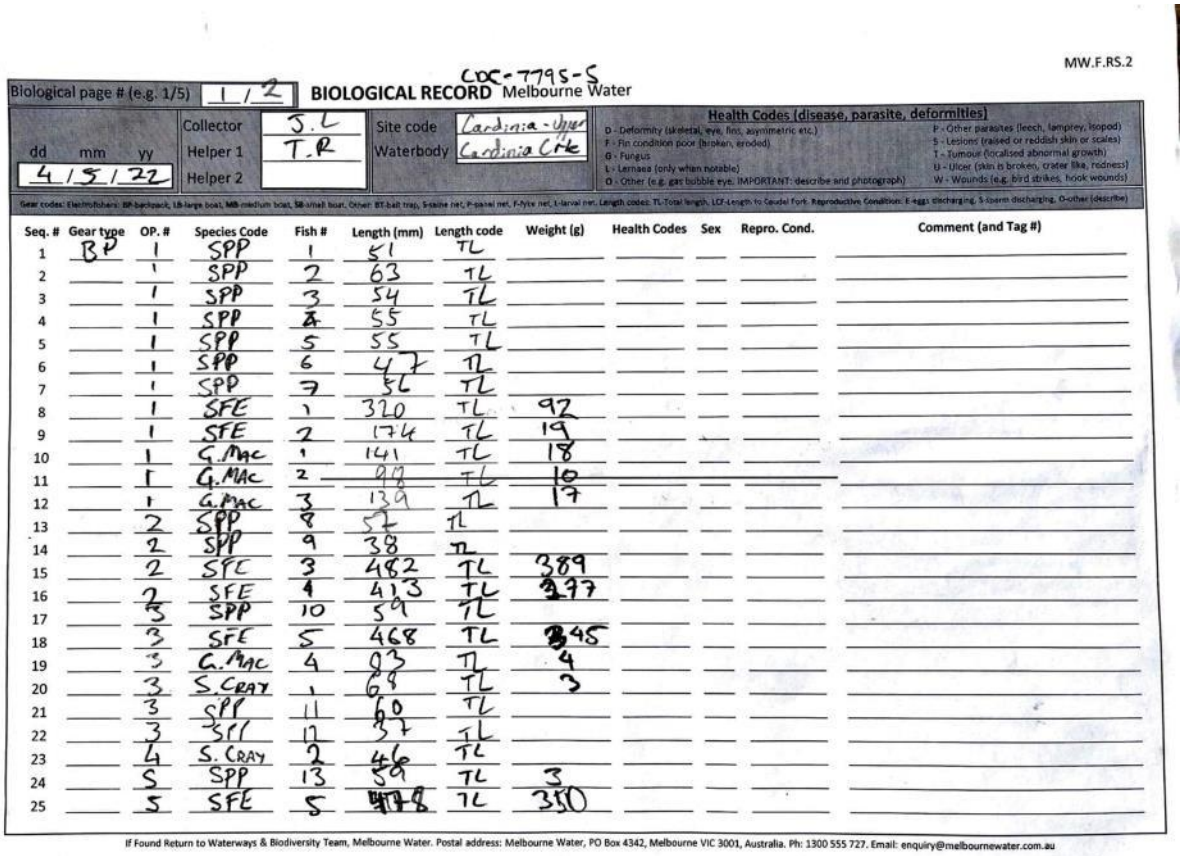

MW.F.RS.2

COC-7795-S

Biological page # (e.g. 1/5) 1/2

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 4/5/22

Collector: S.L
Helper 1: T.R
Helper 2:

Site code: Cardinia-Upper
Waterbody: Cardinia Crk

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	SPP	1	51	TL					
2		1	SPP	2	63	TL					
3		1	SPP	3	54	TL					
4		1	SPP	4	55	TL					
5		1	SPP	5	55	TL					
6		1	SPP	6	47	TL					
7		1	SPP	7	56	TL					
8		1	SFE	1	320	TL	92				
9		1	SFE	2	174	TL	19				
10		1	G.Mac	1	141	TL	18				
11		1	G.Mac	2	99	TL	10				
12		1	G.Mac	3	139	TL	17				
13		2	SPP	8	52	TL					
14		2	SPP	9	38	TL					
15		2	SFE	3	482	TL	389				
16		2	SFE	4	413	TL	377				
17		3	SPP	10	59	TL					
18		3	SFE	5	468	TL	345				
19		3	G.Mac	4	93	TL	4				
20		3	S.Cray	1	68	TL	3				
21		3	SPP	11	60	TL					
22		3	SFE	12	37	TL					
23		4	S. Cray	2	46	TL					
24		5	SPP	13	59	TL	3				
25		5	SFE	5	478	TL	350				

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MW.F.RS.2

Biological page # (e.g. 1/5) 2 / 2 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy	Collector	Site code	Health Codes (disease, parasite, deformities)
04 / 05 / 22	Helper 1 J. L	Waterbody Cardinia Up / Cardinia Crk	D - Deformity (skeletal, eye, fins, asymmetric etc.) P - Other parasites (leech, lamprey, isopod)
	Helper 2 T. R		F - Fin condition poor (broken, eroded) S - Lesions (raised or reddish skin or scales)
			G - Fungus T - Tumour (localised abnormal growth)
			L - Lernaea (only when notable) U - Ulcer (skin is broken, crater like, redness)
			O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph) W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	5	G.Mac	5	132	TL	19				
2		6	SFE	6	331	TL	72				
3		6	SFE	7	409	TL	165				
4		7	SPP	14	32	TL	1				
5		8	SFE	8	516	TL	422				
6											
7											
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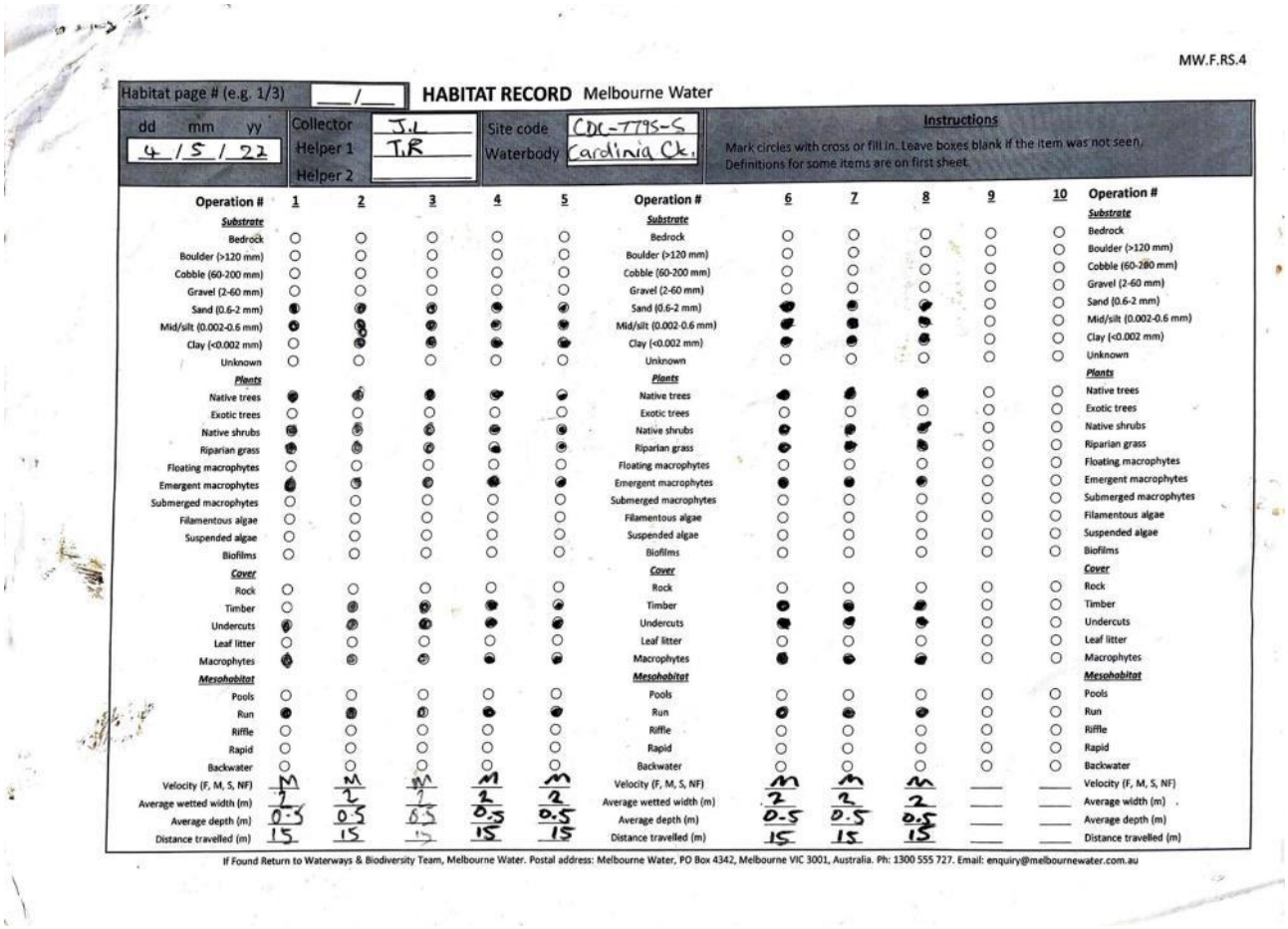

MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy: 4/5/22

Collector: J.L

Helper 1: T.R

Helper 2:

Site code: CDC-7795-S

Waterbody: Cardinia Ck.

Instructions

Mark circles with cross or fill in. Leave boxes blank if the item was not seen. Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	●	●	●	●	●	Sand (0.6-2 mm)	●	●	●	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	●	●	●	●	●	Mid/silt (0.002-0.6 mm)	●	●	●	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	○	●	●	●	●	Clay (<0.002 mm)	●	●	●	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	●	●	●	Native trees	●	●	●	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	●	●	●	●	●	Native shrubs	●	●	●	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	●	●	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	●	●	●	●	●	Emergent macrophytes	●	●	●	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	○	○	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	○	○	○	○	○	Biofilms	○	○	○	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	○	○	○	○	○	Rock	○	○	○	○	○	Rock
Timber	○	●	●	●	●	Timber	●	●	●	○	○	Timber
Undercuts	●	●	●	●	●	Undercuts	●	●	●	○	○	Undercuts
Leaf litter	○	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	●	●	●	●	●	Macrophytes	●	●	●	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	○	○	○	○	○	Pools	○	○	○	○	○	Pools
Run	●	●	●	●	●	Run	●	●	●	○	○	Run
Riffle	○	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	M	M	M	M	M	Velocity (F, M, S, NF)	M	M	M	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	2	2	2	2	2	Average wetted width (m)	2	2	2	___	___	Average width (m)
Average depth (m)	0.5	0.5	0.5	0.5	0.5	Average depth (m)	0.5	0.5	0.5	___	___	Average depth (m)
Distance travelled (m)	15	15	15	15	15	Distance travelled (m)	15	15	15	___	___	Distance travelled (m)

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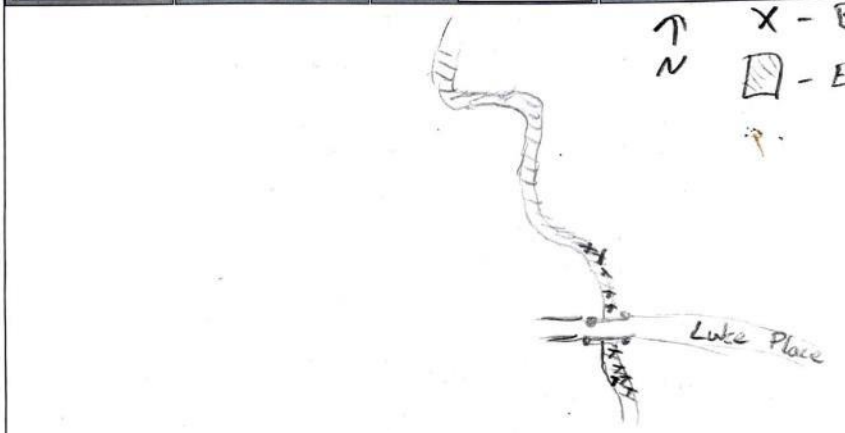
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
4/5/22	J.L.	CDC-7795-S	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody Cardinia Ck	



Comments:

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TAR-22224-S

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

MW.F.RS.1

Date sample began (dd mm yy): 02 / 05 / 22

Collector: J.L
Helper 1: T.R
Helper 2:

Site code: TARAGO
Waterbody: TARAGO RIVER
Location description: Access via Council Picnic Point Reserve

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected.
Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEUIRVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.2	14.8	7.25	348.9	14.3	–	6.53	64.5

Bottom depth (m) _____ Date & Time of Sampling 02 / 05 / 22 : 10:57

Platypus
Seen ○
Not seen ☒

Conditions

Waterbody		Weather	
Stream	✓	Sunny	✓
Channel	○	Cloudy	○
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	**Tidal**	
Farm dam	○	Yes	○
Billabong	○	No	✓
Estuary	○	**Flow**	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	✓
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates
Upstream
-36.084028
145.813324
Downstream
-36.08323
145.811778

Comments

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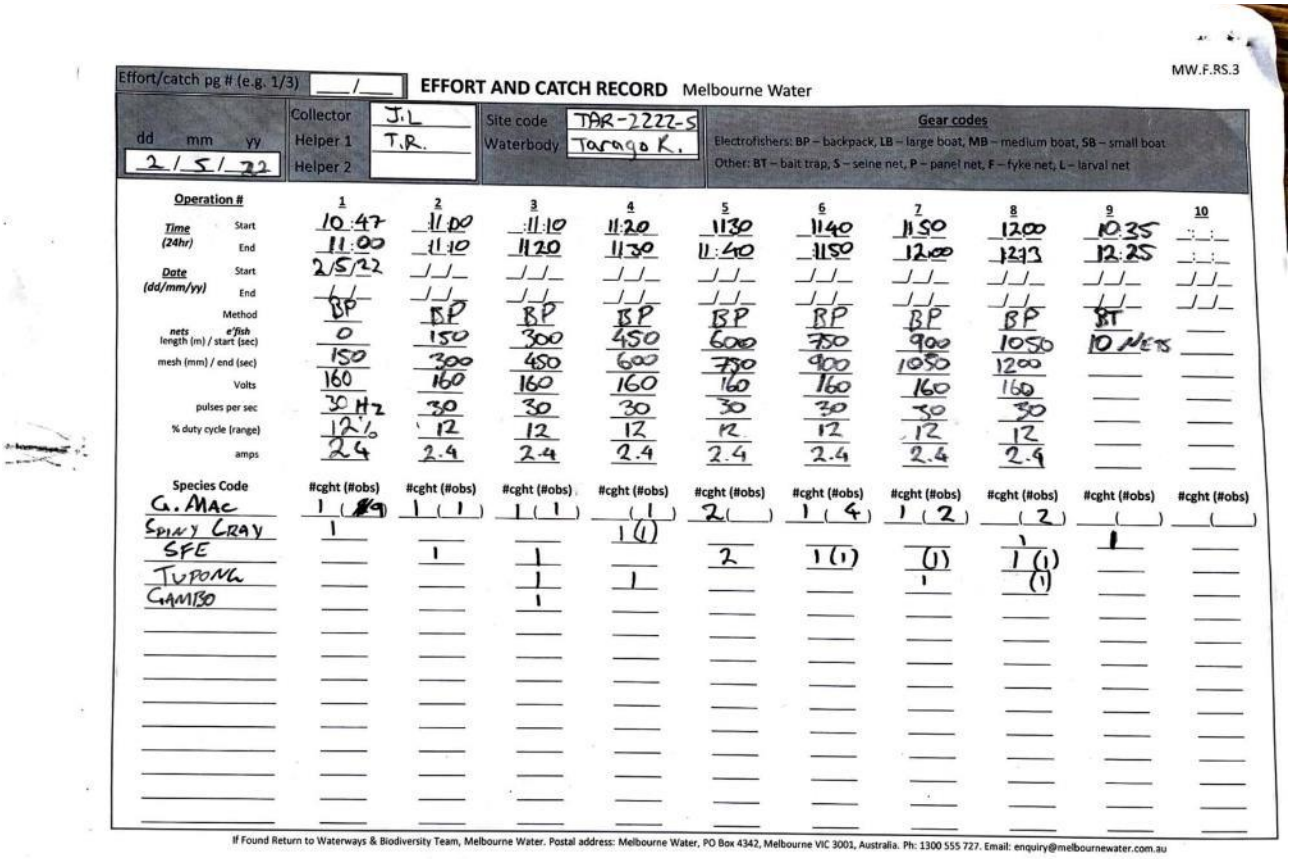

MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 2/5/22

Collector: J.L
Helper 1: T.R.
Helper 2:

Site code: TAR-2222-S
Waterbody: Taraga K.

Gear codes
Electrofishers: BP – backpack, LB – large boat, MB – medium boat, SB – small boat
Other: BT – bait trap, S – seine net, P – panel net, F – fyke net, L – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	10:47	11:00	11:10	11:20	1130	1140	1150	1200	10:35	:_
Time (24hr) End	11:00	11:10	1120	1130	11:40	1150	1200	1213	12:25	:_
Date (dd/mm/yy) Start	2/5/22	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_
Date (dd/mm/yy) End	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_	_/_/_
Method	BP	BP	BP	BP	BP	BP	BP	BP	BT	
nets length (m) / e-fish start (sec)	0	150	300	450	600	750	900	1050	10 NETS	
mesh (mm) / end (sec)	150	300	450	600	750	900	1050	1200		
Volts	160	160	160	160	160	160	160	160		
pulses per sec	30 Hz	30	30	30	30	30	30	30		
% duty cycle (range)	12%	12	12	12	12	12	12	12		
amps	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4		

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
G. MAC	1 (89)	1 (1)	1 (1)	(1)	2 (__)	1 (4)	1 (2)	(2)	(__)	(__)
SPINY CRAY	1			1 (1)				1	1	
SFE		1	1		2	1 (1)	(1)	1 (1)		
TUPONG			1	1			1	(1)		
GAMBO			1							

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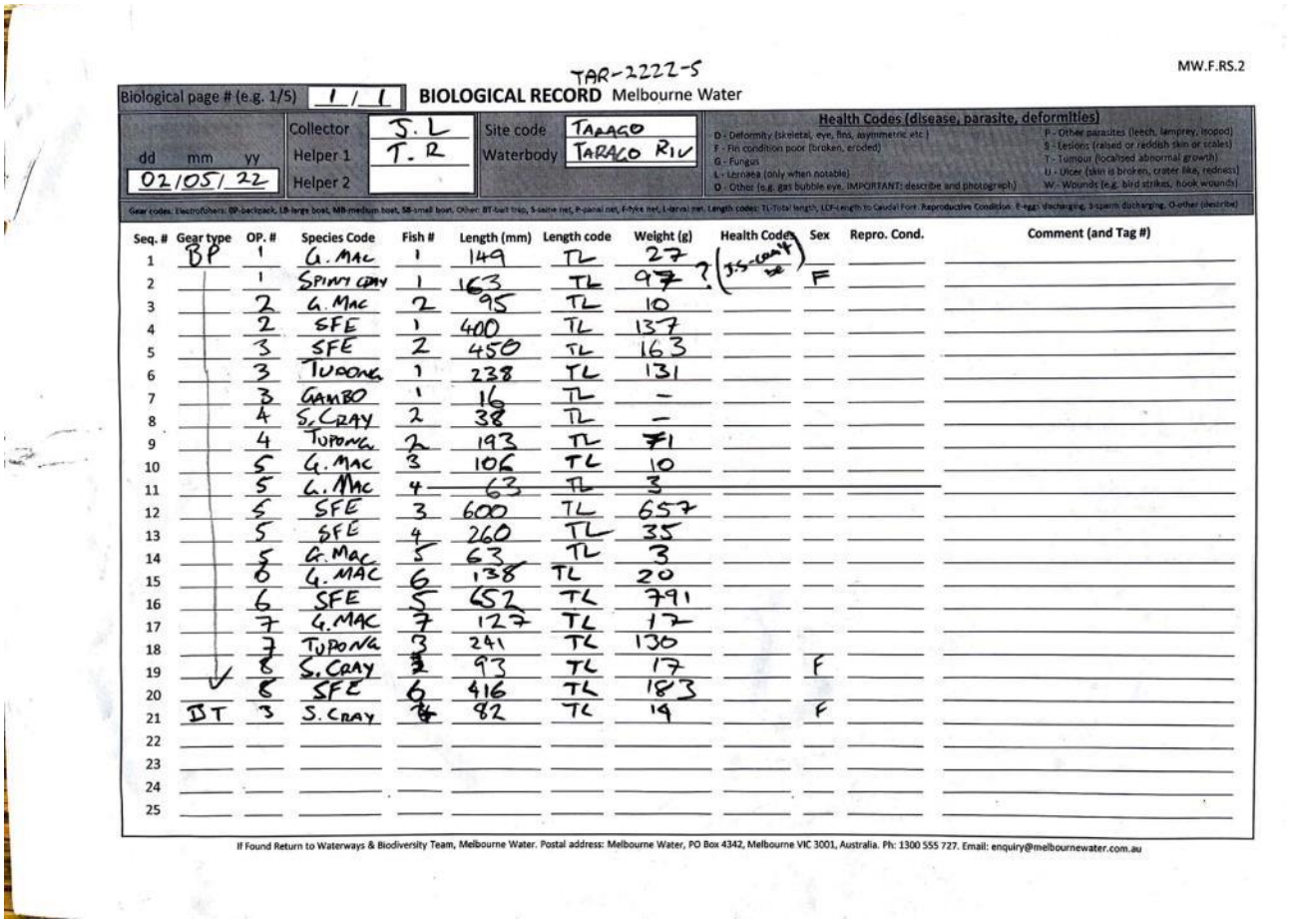

TAR-2222-5

MW.F.RS.2

Biological page # (e.g. 1/5) 1/1 **BIOLOGICAL RECORD** Melbourne Water

dd mm yy: 02/05/22 | Collector: J. L | Helper 1: T. R | Helper 2: | Site code: TARAGO | Waterbody: TARAGO RIV

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.) | F - Fin condition poor (broken, eroded) | G - Fungus | L - Lernaea (only when notable) | O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph) | P - Other parasites (leech, lamprey, isopod) | S - Lesions (raised or reddish skin or scales) | T - Tumour (localised abnormal growth) | U - Ulcer (skin is broken, crater like, redness) | W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Code	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	G. MAC	1	149	TL	27				
2		1	SPINY CRAY	1	163	TL	97 ?		F		
3		2	G. MAC	2	95	TL	10				
4		2	SFE	1	400	TL	137				
5		3	SFE	2	450	TL	163				
6		3	TUPONG	1	238	TL	131				
7		3	GAMBO	1	16	TL	–				
8		4	S. CRAY	2	38	TL	–				
9		4	TUPONG	2	193	TL	71				
10		5	G. MAC	3	106	TL	10				
11		5	G. MAC	4	63	TL	3				
12		5	SFE	3	600	TL	657				
13		5	SFE	4	260	TL	35				
14		5	G. MAC	5	63	TL	3				
15		6	G. MAC	6	138	TL	20				
16		6	SFE	5	652	TL	791				
17		7	G. MAC	7	127	TL	17				
18		7	TUPONG	3	241	TL	130				
19	↓	8	S. CRAY	8	93	TL	17		F		
20		8	SFE	6	416	TL	183				
21	BT	3	S. CRAY	7	82	TL	19		F		
22											
23											
24											
25											

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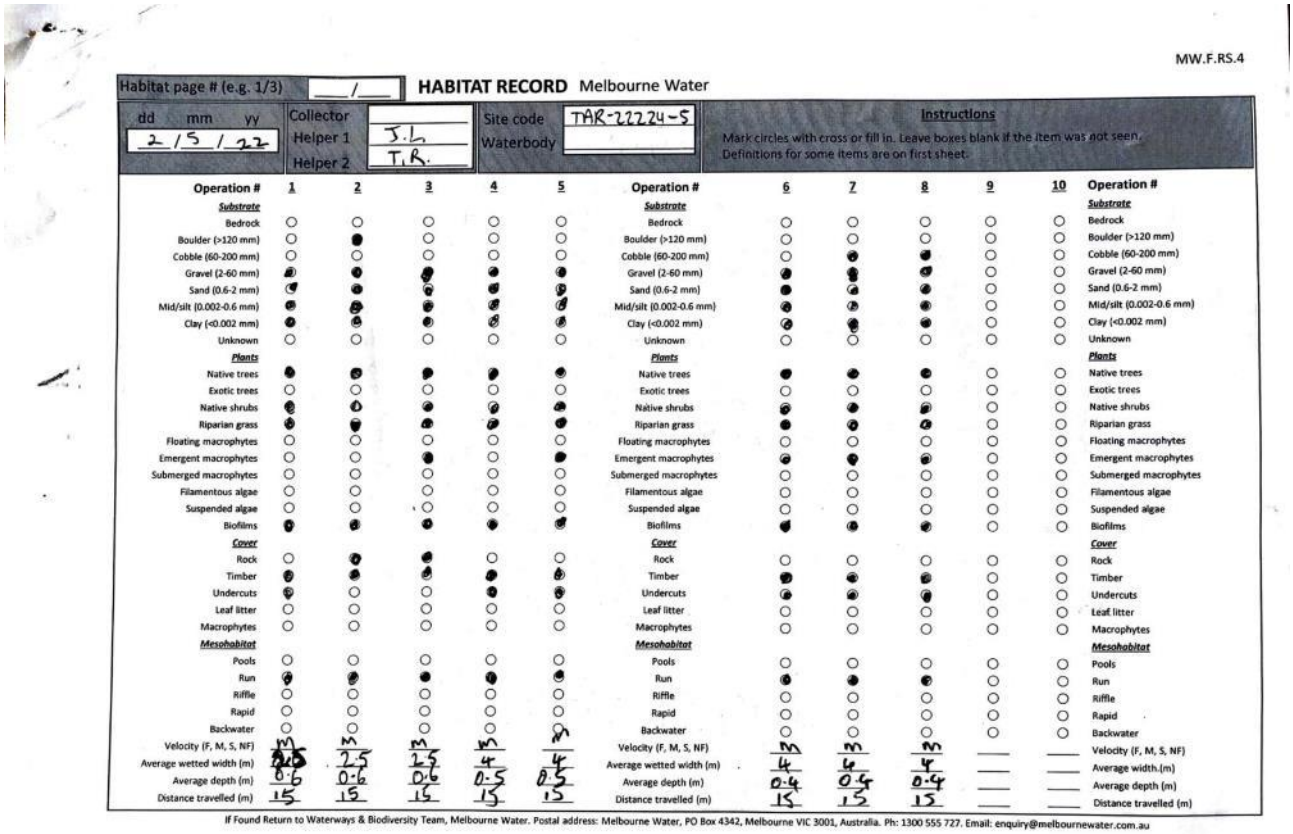

MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy: 2 / 5 / 22

Collector: J.L

Helper 1: T.R.

Helper 2:

Site code: TAR-22224-S

Waterbody:

Instructions

Mark circles with cross or fill in. Leave boxes blank if the item was not seen. Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	●	○	○	○	Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)	○	●	●	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	●	●	●	●	●	Gravel (2-60 mm)	●	●	●	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	●	●	●	●	●	Sand (0.6-2 mm)	●	●	●	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	●	●	●	●	●	Mid/silt (0.002-0.6 mm)	●	●	●	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	●	●	●	●	●	Clay (<0.002 mm)	●	●	●	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	●	●	●	Native trees	●	●	●	○	○	Native trees
Exotic trees	○	○	○	○	○	Exotic trees	○	○	○	○	○	Exotic trees
Native shrubs	●	●	●	●	●	Native shrubs	●	●	●	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	●	●	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	○	○	●	○	●	Emergent macrophytes	●	●	●	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	○	○	○	○	○	Submerged macrophytes
Filamentous algae	○	○	○	○	○	Filamentous algae	○	○	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	Biofilms	●	●	●	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	○	●	●	○	○	Rock	○	○	○	○	○	Rock
Timber	●	●	●	●	●	Timber	●	●	●	○	○	Timber
Undercuts	●	○	○	●	●	Undercuts	●	●	●	○	○	Undercuts
Leaf litter	○	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	○	○	○	○	○	Macrophytes	○	○	○	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	○	○	○	○	○	Pools	○	○	○	○	○	Pools
Run	●	●	●	●	●	Run	●	●	●	○	○	Run
Riffle	○	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	●	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	M	M	M	M	M	Velocity (F, M, S, NF)	M	M	M	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	~~2.5~~ 4	2.5	2.5	4	4	Average wetted width (m)	4	4	4	___	___	Average width.(m)
Average depth (m)	0.6	0.6	0.6	0.5	0.5	Average depth (m)	0.4	0.4	0.4	___	___	Average depth (m)
Distance travelled (m)	15	15	15	15	15	Distance travelled (m)	15	15	15	___	___	Distance travelled (m)

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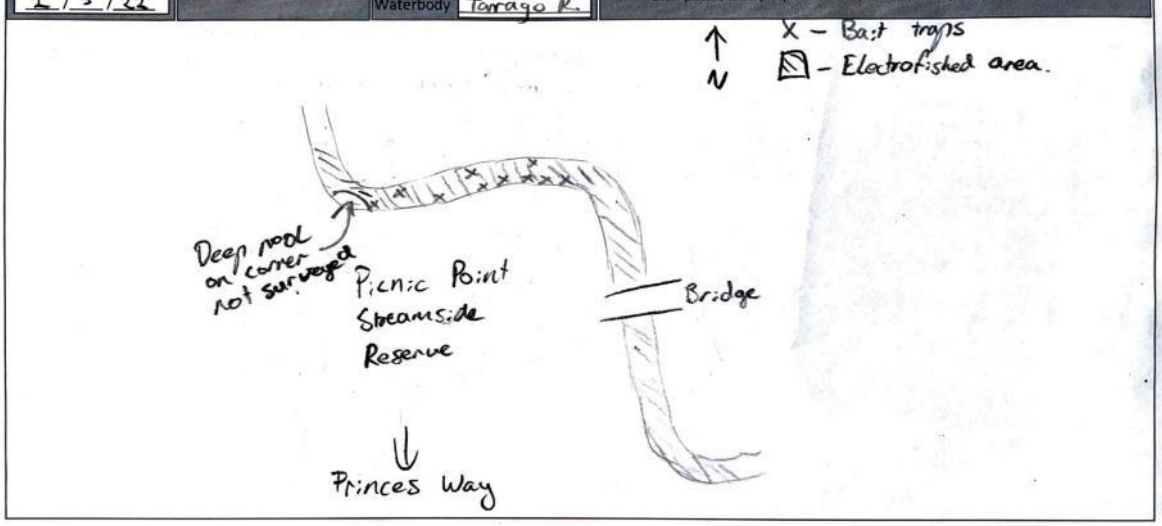
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
2/5/22	J.L	TAR-22224-S	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody Tarago R.	



Comments:

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DNG-13753-1

MW.F.RS.1

FISH SAMPLING RECORD – INSTRUCTIONS, WATER QUALITY & GENERAL DESCRIPTION Melbourne Water

Date sample began dd mm yy: 04/05/22

Collector: J. L

Helper 1: T. R

Helper 2:

Site code: Dan Cre-Up

Waterbody: Dandenong Creek

Location description: Downstream and at HIGH STREET ROAD BRIDGE

Instructions and tips

IMPORTANT: Do not leave a site without checking that all data has been collected. Please take care and time when filling out the forms.
Mark circles with a cross or leave blank if not seen.

Water Quality and General Description Sheet

*Complete water quality at least twice at each surveyed reach.
River/estuary sampling: surface water (~0.2m) at the most representative part of survey reach – 2nd sample if environment substantially changes along reach.
Wetland sampling: depth profile at the deepest part of surveyed reach (0.2m, 1m, 2m, ...so on until the bottom)
*Record date and time for observations.

Biological Record

*Record counts of all individuals caught for each species.
* Measure every individual length, weight, health codes, sex, and reproductive condition until 30 individuals per species and per gear type (electro, bait) have been measured. Try to capture the shorted and longest individual within these 30 individuals. After the 30th individual, no measurements are required, just total counts.
*Fish records and counts can also include fish seen and accurately identified, but not caught – but these are to be recorded these separately (as 'observed' not 'caught'). Crustaceans (yabbies, crayfish, shrimp) and platypus are also to be recorded and identified to genus, when necessary/possible.
*Separate 'Condition' codes with a " / " and always provide a brief description when using the "O" (Other) code. You may record the number of abnormalities in brackets. i.e.
If a fish has, 1 wound, 6 Learnea and bubble eye: W (1) / L (6) /O (bubble eye).
*Record Lernaea when a notable number are present. This is defined as: if fish <100 mm total length, report any Lernaea; if fish >100 mm total length, report if more than 3 Lernaea.

Effort and Catch Record Sheet

*Please record a start time, end time, and method for every operation.
*Where data for an operation are the same as the previous operation, some fields can be left blank. This applies to the start date, end date, net length, net mesh and electrofishing setting fields.
*Record every operation individually for electrofishing. If there are 10 unbaited bait traps, pool all together (Method B10).
* Species code is a combination of the first four letters of the fish's genus and species (i.e. Tupong, *Pseudaphritis urvillii*, code is PSEURVI).

Habitat Record

* Record data for the area within waterbody banks.
* The difference between a tree and a shrub is that a tree is at least 5cm in diameter at a point 1m above the ground. Shrubs usually have many small stems rising from the base.
* Mesohabitat definitions: Pool (deep, wide, slow), Run (moderate depth, width and velocity, with an unbroken surface), Riffle (shallow, fast, broken surface), Rapid (turbulent, fast, steep), Backwater (separate from main channel, low flow).
* Velocity definitions are: F=Fast (>0.5m/s), M=Moderate, S=Slow (<0.1m/s), NF=No flow (stagnant).
* Submerged macrophytes have both roots and leaves underwater. Emergent macrophytes are rooted underwater but some leaves are either out of the water or floating. Floating macrophytes are not rooted to the substrate.
* Biofilm is the coat of green/brown slime (consisting of microorganisms) covering rocks, plants etc. Filamentous algae are fine, thin threads of algae normally attached to plants, rocks etc. Suspended algae are non attached and floating.
* Wetted width refers to the average wetted channel width.

Sample #	Depth (m)	Temp. (°C)	pH	Cond. (µS.cm)	Turb. (NTU)	Secchi (m)	D.O. (mg/L)	D.O. (%sat)
1	0.6	13.6	7.56	1637	33.8	–	5.63	63.2

Bottom depth (m) 0.6 Date & Time of Sampling 4/5/22 7:43

Platypus
Seen ○
Not seen ⊘

Conditions

Waterbody		Weather	
Stream	⊘	Sunny	○
Channel	○	Cloudy	⊘
Floodplain	○	Rainy	○
Lake	○	Other	○
Storage	○	Tidal	
Farm dam	○	Yes	○
Billabong	○	No	⊘
Estuary	○	Flow	
Wetland (Pa)	○	No flow	○
Wetland (La)	○	Flowing	⊘
Wetland (Es)	○		

Pa=Palustrine, La=Lacustrine, Es=Estuarine

Sampling Coordinates

Upstream
-37.874060
145.193068
Downstream
-37.876562
145.191887

Comments

- Upstream Section became too deep
- Small anabranch surveyed.

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MW.F.RS.3

Effort/catch pg # (e.g. 1/3) ___/___

EFFORT AND CATCH RECORD Melbourne Water

dd mm yy: 4 / 5 / 22

Collector: JL
Helper 1: THR
Helper 2:

Site code: DNG-13753-1
Waterbody: Dandenong Ck

Gear codes
Electrofishers: **BP** – backpack, **LB** – large boat, **MB** – medium boat, **SB** – small boat
Other: **BT** – bait trap, **S** – seine net, **P** – panel net, **F** – fyke net, **L** – larval net

Operation #	1	2	3	4	5	6	7	8	9	10
Time (24hr) Start	750	800	810	820	830	840	850	::	::	::
End	800	810	820	830	840	850	900	::	::	::
Date (dd/mm/yy) Start	4/5/22	//	//	//	//	//	//	//	//	//
End	//	//	//	//	//	//	//	//	//	//
Method	BP	BP	BP	BP	BP	BP	BP			
nets length (m) / e'fish start (sec)	0	150	300	450	600	750	900			
mesh (mm) / end (sec)	150	300	450	600	750	900	1050			
Volts	200	200	200	200	200	200	200			
pulses per sec	30 Hz	30	30	30	30	30	30			
% duty cycle (range)	12	12	12	12	12	12	12			
amps	2.1	2.1	2.1	2.1	2.1	2.1	2.1			

Species Code	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)	#cght (#obs)
SFE	1 (1)	0 (1)	2 (0)	1 (2)	0 (1)	1 (2)	2 (0)	( )	( )	( )
GAMBO	1	1	1	(1)						
G. FISH						3 (4)	2 (1)			

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DNA-137534

MW.F.RS.2

Biological page # (e.g. 1/5) ___/___

BIOLOGICAL RECORD Melbourne Water

dd mm yy: 4/5/22

Collector: JL.
Helper 1: T.R.
Helper 2:

Site code: Dan Crk-Up
Waterbody: Dandenong Crk

Health Codes (disease, parasite, deformities)

D - Deformity (skeletal, eye, fins, asymmetric etc.)
F - Fin condition poor (broken, eroded)
G - Fungus
L - Lernaea (only when notable)
O - Other (e.g. gas bubble eye. IMPORTANT: describe and photograph)
P - Other parasites (leech, lamprey, isopod)
S - Lesions (raised or reddish skin or scales)
T - Tumour (localised abnormal growth)
U - Ulcer (skin is broken, crater like, redness)
W - Wounds (e.g. bird strikes, hook wounds)

Gear codes: Electrofishers: BP-backpack, LB-large boat, MB-medium boat, SB-small boat. Other: BT-bait trap, S-seine net, P-panel net, F-fyke net, L-larval net. Length codes: TL-Total length, LCF-Length to Caudal Fork. Reproductive Condition: E-eggs discharging, S-sperm discharging, O-other (describe)

Seq. #	Gear type	OP. #	Species Code	Fish #	Length (mm)	Length code	Weight (g)	Health Codes	Sex	Repro. Cond.	Comment (and Tag #)
1	BP	1	SFE	1	335	TL	135	F			
2		1	GAMBO	1	44	TL	-				
3		2	GAMBO	2	23	TL	-				
4		3	SFE	2	431	TL	268				
5		3	SFE	3	607	TL	513				
6		3	GAMBO	3	21	TL	-				
7		4	SFE	4	526	TL	342				
8		6	SFE	5	361	TL	181				
9		6	G. FISH	1	191	LCF	164	L			
10		6	G. FISH	2	192	LCF	151	L			
11		6	G. FISH	3	~~44~~	~~LCF~~	-				
12		7	SFE	6	311	TL	105				
13		7	SFE	7	663	TL	572				
14		7	G. FISH	4	42	LCF	-				
15		7	G. FISH	5	45	LCF	-				
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

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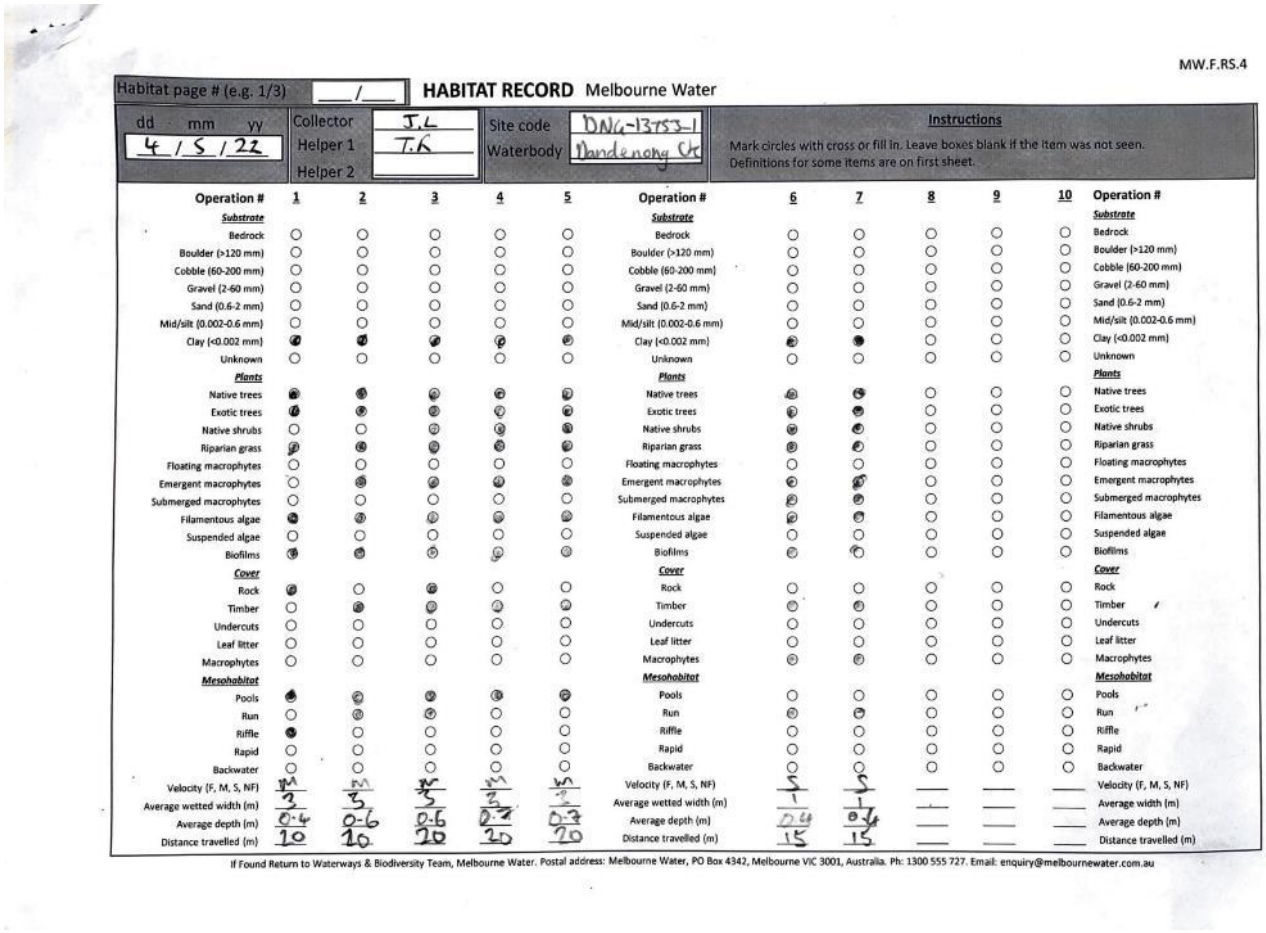

MW.F.RS.4

Habitat page # (e.g. 1/3) ___/___

HABITAT RECORD Melbourne Water

dd mm yy: 4 / 5 / 22

Collector: J.L
Helper 1: T.K
Helper 2:

Site code: DNG-13753-1
Waterbody: Dandenong Ck

Instructions
Mark circles with cross or fill in. Leave boxes blank if the item was not seen.
Definitions for some items are on first sheet.

Operation #	1	2	3	4	5	Operation #	6	7	8	9	10	Operation #
Substrate						***Substrate***						***Substrate***
Bedrock	○	○	○	○	○	Bedrock	○	○	○	○	○	Bedrock
Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)	○	○	○	○	○	Boulder (>120 mm)
Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)	○	○	○	○	○	Cobble (60-200 mm)
Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)	○	○	○	○	○	Gravel (2-60 mm)
Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)	○	○	○	○	○	Sand (0.6-2 mm)
Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)	○	○	○	○	○	Mid/silt (0.002-0.6 mm)
Clay (<0.002 mm)	●	●	●	●	●	Clay (<0.002 mm)	●	●	○	○	○	Clay (<0.002 mm)
Unknown	○	○	○	○	○	Unknown	○	○	○	○	○	Unknown
Plants						***Plants***						***Plants***
Native trees	●	●	●	●	●	Native trees	●	●	○	○	○	Native trees
Exotic trees	●	●	●	●	●	Exotic trees	●	●	○	○	○	Exotic trees
Native shrubs	○	○	●	●	●	Native shrubs	●	●	○	○	○	Native shrubs
Riparian grass	●	●	●	●	●	Riparian grass	●	●	○	○	○	Riparian grass
Floating macrophytes	○	○	○	○	○	Floating macrophytes	○	○	○	○	○	Floating macrophytes
Emergent macrophytes	○	●	●	●	●	Emergent macrophytes	●	●	○	○	○	Emergent macrophytes
Submerged macrophytes	○	○	○	○	○	Submerged macrophytes	●	●	○	○	○	Submerged macrophytes
Filamentous algae	●	●	●	●	●	Filamentous algae	●	●	○	○	○	Filamentous algae
Suspended algae	○	○	○	○	○	Suspended algae	○	○	○	○	○	Suspended algae
Biofilms	●	●	●	●	●	Biofilms	●	●	○	○	○	Biofilms
Cover						***Cover***						***Cover***
Rock	●	○	●	○	○	Rock	○	○	○	○	○	Rock
Timber	○	●	●	●	●	Timber	●	●	○	○	○	Timber
Undercuts	○	○	○	○	○	Undercuts	○	○	○	○	○	Undercuts
Leaf litter	○	○	○	○	○	Leaf litter	○	○	○	○	○	Leaf litter
Macrophytes	○	○	○	○	○	Macrophytes	●	●	○	○	○	Macrophytes
Mesohabitat						***Mesohabitat***						***Mesohabitat***
Pools	●	●	●	●	●	Pools	○	○	○	○	○	Pools
Run	○	●	●	○	○	Run	●	●	○	○	○	Run
Riffle	●	○	○	○	○	Riffle	○	○	○	○	○	Riffle
Rapid	○	○	○	○	○	Rapid	○	○	○	○	○	Rapid
Backwater	○	○	○	○	○	Backwater	○	○	○	○	○	Backwater
Velocity (F, M, S, NF)	~~M~~	~~M~~	~~M~~	~~M~~	~~M~~	Velocity (F, M, S, NF)	S	S	___	___	___	Velocity (F, M, S, NF)
Average wetted width (m)	3	3	5	2	2	Average wetted width (m)	1	1	___	___	___	Average width (m)
Average depth (m)	0·4	0·6	0·6	0·3	0·3	Average depth (m)	0·4	0·4	___	___	___	Average depth (m)
Distance travelled (m)	20	20	20	20	20	Distance travelled (m)	15	15	___	___	___	Distance travelled (m)

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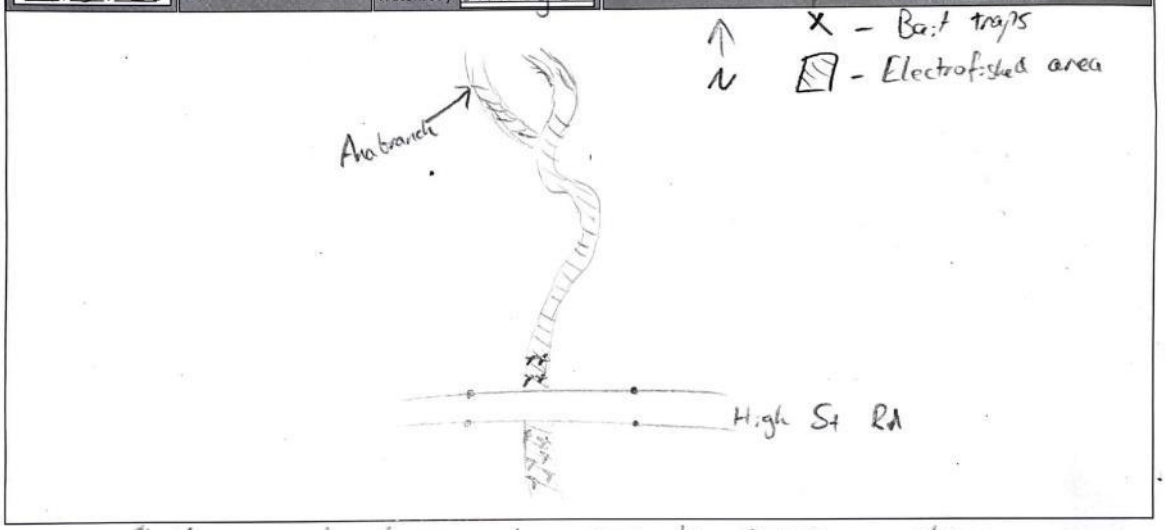
MW.F.RS.5

Site map page # (e.g. 1/2) ___/___ **SITE MAP** Melbourne Water

dd mm yy	Drawer	Site code	Instructions
4/5/22	JL	DNG-13753-	Draw picture to help explain location, site details etc., if required or needed.
		Waterbody Dandenong Ck.	



Comments: Main creek became too deep to survey upstream.

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