

MERTON AND BRANKEET CREEK FISH SURVEYS 2016

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Methods

In November 2016, ARI staff surveyed fish at thirteen sites in the Merton and Brankeet creeks from Ancona Road upstream to their headwaters (Figure 1, Table 1). The surveys targeted all species, but particularly Southern pygmy perch. Sites were selected based on previous surveys ¹ and consultation with Goulburn Broken Catchment Management Authority and local community members. Southern pygmy perch (upper Murray River to Avoca River – Murray Darling lineage) are listed on the 'Advisory list of threatened vertebrate fauna in Victoria (2013)' but are not currently listed on the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 or Victorian *Flora and Fauna Guarantee Act* 1988 ². Fish were collected at each site using backpack electrofishing. Bait traps were also set at 10 of the 13 sites and were set in slow flowing water and amongst various habitat types, including aquatic vegetation and instream woody debris, for a duration of approximately 2 hours. Bait traps were not set at sites with faster flowing water with a rock substrate and no instream aquatic vegetation. Four single-wing fyke nets were also set at Brankeet Creek at Ancona Road (site 01) because there was large areas of deeper water which was too deep to backpack, as well as to demonstrate to the community the different methods used to survey fish. Backpack electrofishing methods followed the Sustainable Rivers Audit protocol ³. Fyke netting consisted of two single wing fyke nets (5 mm mesh) and two single wing fine mesh fyke nets (2 mm mesh) set overnight, with an approximate soak time of 16 hours. Floats were used at the cod end of each net to ensure that any mammals or turtles captured would be safely held until release. Additionally, platypus rings were used at the cod end to allow an escape passage for any captured mammals. At this site bait traps were also set overnight for 16 hours. All fish were released at the site of capture after being measured for total length (mm), and River blackfish and Southern pygmy perch were also weighed (g).

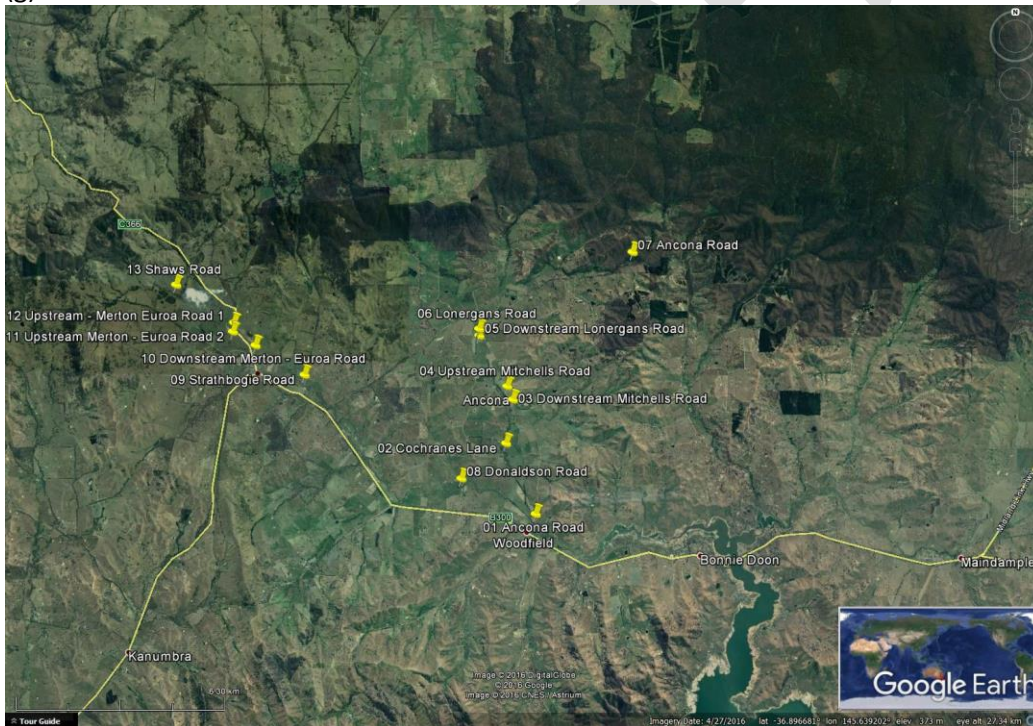


Figure 1. Map of survey sites in Merton and Brankeet Creeks

¹ VBA. (2016). Victorian Biodiversity Atlas, 2016. Department of Environment, Land, Water and Planning.

² DSE. (2013). Advisory list of threatened vertebrate fauna in Victoria, 2013. Department of Sustainability and Environment, Melbourne, Victoria.

³ MDBIC. (2007). Sustainable Rivers Audit Protocols: Approved Manual for Implementation Period 4: 2007-2008. Murray-Darling Basin Commission, Canberra.

Table 1. Locations of fish surveys in Merton and Brankeet Creeks, November 2016

Site	Creek	Location	Latitude	Longitude	Date/s sampled	Gear type
01	Brankeet	Ancona bridge on Ancona Road			08 November 2016 09 November 2016	Bait Traps (x10); Fyke netting (x4) Backpack electrofishing
02	Brankeet	Cochranes Lane			10 November 2016	Backpack electrofishing; Bait Traps (x10)
03	Brankeet	Private property downstream Mitchells Road			10 November 2016	Backpack electrofishing; Bait Traps (x10)
04	Brankeet	Mitchells Road			10 November 2016	Backpack electrofishing; Bait Traps (x10)
05	Brankeet	Private property downstream Lonergans Road			11 November 2016	Backpack electrofishing
06	Brankeet	Lonergans Road			11 November 2016	Backpack electrofishing
07	Brankeet	Private property off Ancona Road			09 November 2016	Backpack electrofishing
08	Merton	Donaldson Road			07 November 2016	Backpack electrofishing; Bait Traps (x10)
09	Merton	Merton – Strathbogie Road			07 November 2016	Backpack electrofishing; Bait Traps (x9)
10	Merton	Private property downstream Merton – Euroa Road			09 November 2016	Backpack electrofishing; Bait Traps (x10)

11	Merton	Private property upstream Merton – Euroa Road	08 November 2016	Backpack electrofishing; Bait Traps (x10)
12	Merton	Private property upstream Merton – Euroa Road	08 November 2016	Backpack electrofishing; Bait Traps (x10)
13	Merton	Private property off Shaws Road	08 November 2016	Backpack electrofishing; Bait Traps (x5)

Results

- A total of 571 fish, representing five native and seven introduced species, were collected during surveys of Merton and Brankeet Creeks. Other fauna also collected included 193 Common yabbies and one Upland burrowing crayfish (Table 2).
- The most abundant fish species captured was flat-headed gudgeon (*philypnodon grandiceps* $N = 177$), followed by obscure galaxias (*galaxias oilros* $N = 115$) and carp (*cyprinus carpio* $N = 107$).
- Southern pygmy perch ($N = 43$) were collected from three sites in Merton Creek and four sites in Brankeet Creek. This is the first records of Southern pygmy perch from Brankeet Creek. Southern pygmy perch were in spawning condition. The Southern pygmy perch were strongly associated with instream aquatic vegetation. Figure 2 shows photographs of instream aquatic vegetation where Southern pygmy perch were collected during the surveys. This is consistent with other work where Southern pygmy perch have been showed to prefer structured habitats such as macrophytes and wood, but a stronger preference with macrophytes (See Price et al. 2016). It is recommended to conduct more surveys over a finer spatial scale to determine the distribution and abundance of Southern pygmy perch to in both creeks to help determine areas for management and habitat improvement.
- River blackfish were collected from two sites on Merton Creek; they were not collected in Brankeet Creek. River blackfish ranged in size from 132 to 255 mm, suggesting there has been a no or very reduced recruitment over the past two years. No young of year River blackfish were collected, indicating a lack of recruitment last year. Gravid females were collected, so hopefully River blackfish spawning and recruitment will be successful this year. Increased spring flows compared to previous years may help this.
- Carp were more abundant in Brankeet Creek ($N = 107$) than Merton Creek ($N = 2$). Seventy seven (72%) of Carp were collected from one site (site 03 - downstream Mitchells road). Carp were observed swimming upstream at Ancona Road (presumably migrating out of Lake Eildon). The road crossing at Mitchells road may act as a barrier, restricting carp moving further upstream. Higher flows would allow carp to pass over the crossing. Surveying more sites upstream for carp would confirm their distribution. Downstream of this road crossing may be a good location for strategic carp removal (See figure 3 for examples of instream barriers in Brankeet creek).
- Only small numbers of Carp were collected in Merton Creek, however Carp were observed in a deeper hole at the junction with Hut Creek.
- Both Brankeet and Merton Creeks can cease to flow during drier conditions and did so in the Millennium drought, with the upper Brankeet also ceasing to flow for short periods in the summer of 2015/16. Thus, understanding of the location and condition of deeper areas within the two creeks is important, particularly if a fish rescue operation is needed. During summer periods or low flow conditions, these deeper areas could be refuge places for fish. It is important that these refuge areas contain good habitat to support fish populations. These areas could be priority for habitat improvement, such as riparian fencing, revegetation and re-snagging. Identifying refuge habitat will also identify areas where targeted introduced species removal (Carp and Redfin) could occur. We recommend a mapping survey during summer to identify deeper refuge areas, as well as accompanying fish survey to confirm the use of these locations by fish, particularly River blackfish and Southern pygmy perch.
- The index of stream condition recognises that both Brankeet and Merton Creeks are in moderate condition. Improving the condition of the riparian zone, instream habitat and water flow of these waterways would benefit their local fish communities. For example, the addition of hollow logs or spawning tubes may help River blackfish spawning, as the fish were often collected from rocky banks, which are more open to predation than hollow logs or spawning tubes. Also IWH provides spawning substrate as River blackfish are known to spawn in hollow logs. Enhancing aquatic vegetation extent in slow flowing areas may also improve habitat for Southern pygmy perch.
- It may be worthy to generate a catalogue or map of barriers along Merton and Brankeet Creeks. This may help focus habitat improvements for Southern pygmy perch above barriers where there could be less competition or impact from carp.
- Please see figures 5–15 for photos of fish species captured during the surveys.

Table 2a. Species collected, abundance (*N*) and size range (total length, mm) per site surveyed in Brankeet Creek, November 2016

Site Number																
Species	01		02		03		04		05		06		07		Total Brankeet	
	N	Range	N	Range	N	Range	N	Range	N	Range	N	Range	N	Range	N	Range
River blackfish <i>gadopsis marmoratus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Obscure galaxias <i>galaxias oliros</i>	-	-	-	-	2	42 - 46	10	38 - 108	4 8	37 - 53	7	38-45	-	-	67	38-108
Southern pygmy perch# <i>gannoperca australias</i>	-	-	1	78	8	46 - 57	8	49 - 64	1 0	47 - 68	-	-	-	-	27	46 - 78
Flat-headed gudgeon <i>philypnodon grandiceps</i>	89	26 - 96	-	-	-	-	-	-	-	-	-	-	-	-	89	26 - 96
Australian smelt <i>retropinna semoni</i>	15	31 - 55	-	-	3	53-55	-	-	-	-	-	-	-	-	18	31 - 55
Goldifsh * <i>carassius auratus</i>	-	-	-	-	1	300	-	-	-	-	-	-	-	-	1	300
Carp * <i>cyprinus carpio</i>	9	167 - 450	1 9	350 - 495	77	400 - 750	-	-	-	-	-	-	-	-	105	167 - 750
Eastern gambusia * <i>gambusia holbrooki</i>	2	32 - 33	4	32 - 41	-	-	-	-	-	-	-	-	-	-	6	32 - 41
Rainbow trout * <i>oncorhynchus mykiss</i>	-	-	-	-	-	-	-	-	-	-	1	108	1	173	2	108 - 173
Redfin * <i>perca fluviatilis</i>	7	94 - 149	1	116	11	90 - 159	-	-	1	108	-	-	-	-	20	90 - 159
Roach * <i>rutilus rutilus</i>	-	-	8	109 - 182	13	95 - 208	-	-	-	-	-	-	-	-	21	95 – 208
Brown trout * <i>Salmo trutta</i>	1	344	-	-	1	186	-	-	-	-	-	-	-	-	2	186 - 344
Common yabby <i>cherax destructor</i>	8	14 - 38	2 6	7 - 29	20	9 - 33	28	8 - 32	1 7	10 - 34	5 4	8 - 38	40	11 - 35	193	7 - 38
Upland burrowing crayfish <i>Engaeus lyelli</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	131		5 9		136		46		7 6		6 2		41		551	

* Introduced species

[#] Advisory list for threatened vertebrate fauna in Victoria 2013

Table 2b. Species collected, abundance (N) and size range (total length, mm) per site surveyed in Merton Creek, November 2016 and total fish collected from Merton and Brankeet Creeks.

Species	Site Number												Total Merton		Total Merton and Brankeet	
	08		09		10		11		12		13		N	Range	N	Range
River blackfish <i>gadopsis marmoratus</i>	-	-	-	-	-	-	5	141 - 255	9	132 - 255	-	-	14	132 - 255	14	132 - 255
Obscure galaxias <i>galaxias oliros</i>	1	50	7	35 - 48	7	36 - 132	1	38 - 112	6	44 - 100	11	26 - 44	48	26 - 132	115	26 - 132
Southern pygmy perch [#] <i>nannoperca australias</i>	-	-	8	51 - 79	1	64	-	-	7	52 - 75	-	-	16	51 - 79	43	46 - 79
Flat-headed gudgeon <i>philypnodon grandiceps</i>	2	53 - 56	2	36 - 95	5	36 - 98	2	25 - 92	35	36 - 90	-	-	88	25 - 98	177	25 - 98
Australian smelt <i>retropinna semoni</i>	-	-	1	66	9	54 - 83	6	56 - 65	9	54 - 61	-	-	25	54 - 83	43	31 - 83
Goldfish * <i>carassius auratus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	300
Carp * <i>cyprinus carpio</i>	-	-	-	-	1	460	-	-	1	305	-	-	2	305 - 460	107	167 - 750
Eastern gambusia * <i>gambusia holbrooki</i>	-	-	-	-	1	32	1	26 - 55	2	22	-	-	15	22 - 55	21	22 - 55
Rainbow trout * <i>oncorhynchus mykiss</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	108 - 173
Redfin * <i>perca fluviatilis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	90 - 159
Roach * <i>rutilus rutilus</i>	-	-	1	234	-	-	4	168 - 205	-	-	-	-	5	168 - 234	26	95 - 234
Brown trout * <i>salmo trutta</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	186 - 344
Common yabby <i>Cherax destructor</i>	6	13 - 36	2	8 - 25	13	10 - 33	9	7 - 44	20	8 - 35	3	33 - 40	53	7 - 44	246	7 - 44
Upland burrowing crayfish <i>Engaeus lyelli</i>	1	8	-	-	-	-	-	-	-	-	-	-	1	8	1	8
Total	1		4		37		7		89		14		267			
	0		3				4									

* Introduced species # Advisory list for threatened vertebrate fauna in Victoria 2013



Figure 2. Examples of instream aquatic vegetation where Southern pygmy perch were found



Figure 3. Barriers to fish passage hinder habitat connectivity and restrict fish access to refuge areas. a) Brankeet Creek at Mitchells Road, b) Brankeet Creek at gauging station downstream Lonergans Road.

References

Price AE, Stoffels RJ, Weatherman KA, O'Keefe R, Müller W (2016) Structural habitat selection by Southern pygmy perch (*Nannoperca australis*). Final Report prepared for Murray Local Land Services by The Murray–Darling Freshwater Research Centre, MDFRC Publication 102/2016, May, 26pp.

Native species collected



Figure 4. Photos of Southern pygmy perch. Left photo is an adult female, right photo is an adult male



Figure 5. Adult River blackfish



Figure 6. Adult Australian smelt



Figure 7. Adult Flat-headed gudgeon



Figure 8. Obscure galaxias



Figure 9. Common yabbies. Right photo showing berries (eggs) under the tail of a female



Figure 10. Upland burrowing crayfish



Introduced species collected



Figure 11. Redfin



Figure 12. Adult female Carp



Figure 13. Adult female Eastern gambusia



Figure 14. Adult Roach



Figure 15. Adult Brown trout

Please note that no photos of Goldfish or Rainbow trout were taken during the surveys.