

**A fish survey of the Apted property dams at Strathewen
and nearby Arthurs Creek
(after the February 2009 fires)**



A river blackfish from Arthurs Creek

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EXECUTIVE SUMMARY

This investigation summarises the findings of a fish survey of two dams on the Apted property at Strathewen. It also examined the fish fauna in nearby Arthurs Creek, with particular interest in determining the presence/absence of river blackfish (*Gadopsis marmoratus*).

Although no population of river blackfish was found in the Apted property dams, the dams could potentially support the species. Importantly, there is no exotic fish species present, which would compete for food or habitat. Low cost improvements could be made to further enhance the water quality and aquatic habitat of the dams.

The Apted dams could be used for establishing a viable river blackfish population, one that could possibly be used in the future restocking of Arthurs Creek, in the event that the species is lost from the creek.

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1.0 INTRODUCTION

This investigation summarises the findings of a fish survey of two dams on the Apted property at Strathewen. It also examined the fish fauna in nearby Arthurs Creek, with particular interest in determining the presence/absence of river blackfish (*Gadopsis marmoratus*).

This study provides several recommendations which will improve the aquatic condition of the Apted property dams.

1.1 Background

The river blackfish has a contracting range in the Diamond Creek catchment with a restricted distribution in Arthurs and Running Creeks (McGuckin, 2007). The current drought has been a contributing factor in the loss of river blackfish habitat.

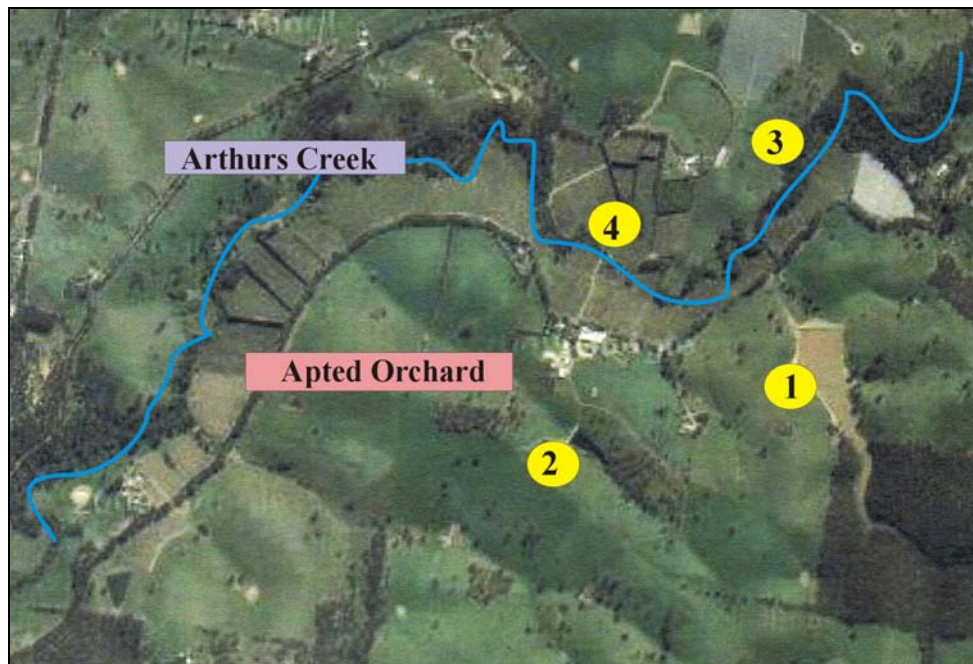
With the headwaters of both Arthurs and Running Creeks burnt during the fires of February 2009, further degradation of remnant pool habitat for the river blackfish is expected to have occurred. It is possible that the first significant rainfall event (14 March 2009) deposited large quantities of silt into the deeper pools of Arthurs Creek and poorly oxygenated water could have been detrimental to the already depleted blackfish populations.

By surveying the Apted property dams, it was hoped that an off-stream population of river blackfish might be found. Potentially, if such a population existed or could be established, it could be used for the future replenishment of river blackfish in Arthurs Creek.

This fish survey was conducted on 17-18 March 2009, three days after the first significant rain event since the bushfires. The streamflow was sufficient to breach the fire break at Strathewen. Streamflow had extended downstream of Arthurs Creek at the time of the study, and was expected to reconnect the pools in Arthurs Creek between Strathewen and Hurstbridge.

2.0 FIELD INVESTIGATION

A total of six locations were surveyed for fish in this study. Figure 1 shows the four fish survey sites on or near the Apted property at Strathewen. Figure 2 shows the six fish sites surveyed between Strathewen and Hurstbridge. Table 1 lists the topographical map reference of each site.

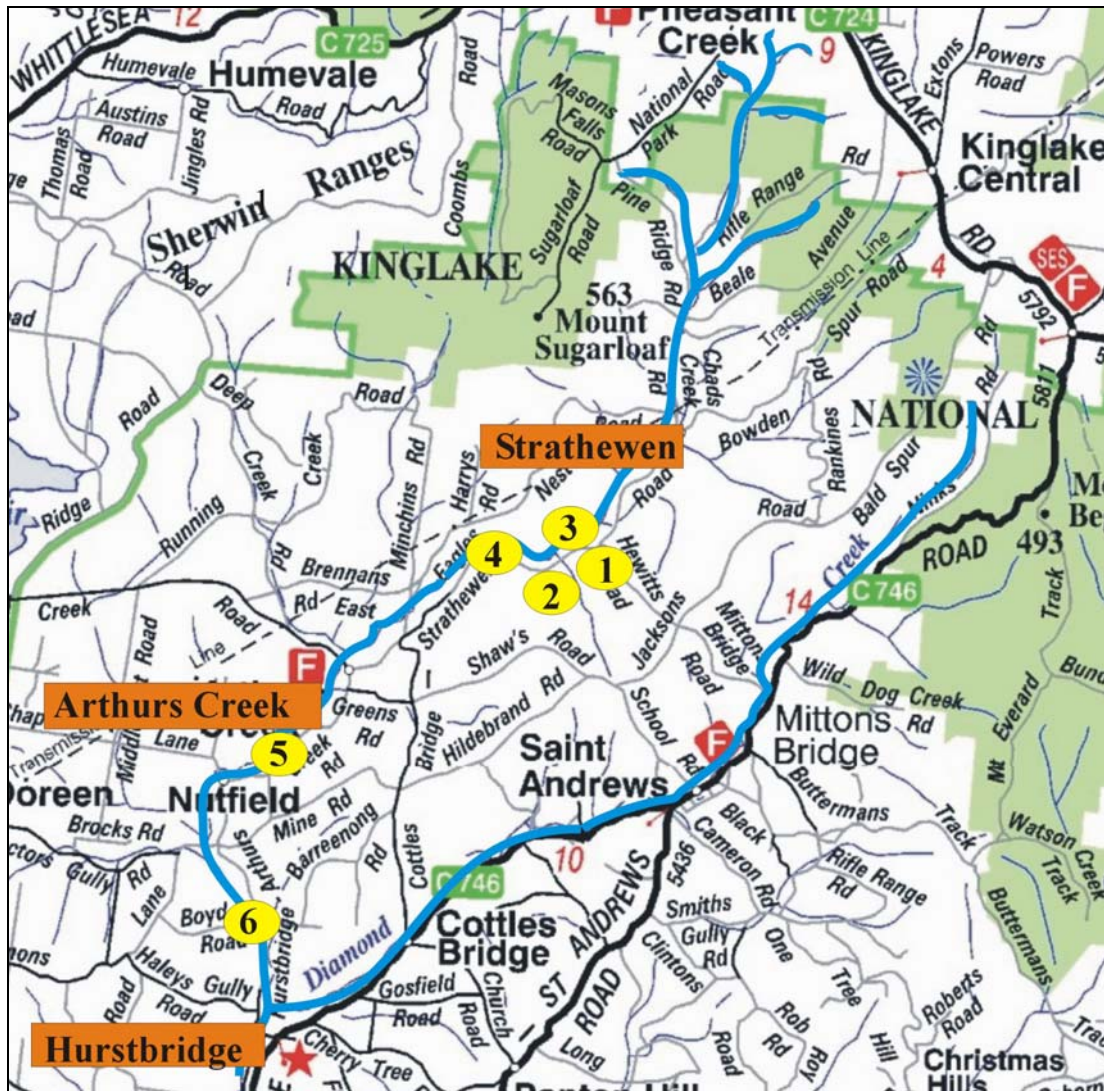


(The base aerial photograph was sourced from Google Maps)

Figure 1. Fish survey location on the Apted property.

Table 1. Fish survey sites (topographical map Ringwood 7922 1:100000).

Site	Location	Zone	Easting	Northing
1	Apted main dam (300 ML)	55	345236	5840627
2	Apted secondary dam (18 ML)	55	344400	5840100
3	Arthurs Creek (long pool near the netted orchard)	55	345296	5841237
4	Arthurs Creek (isolated pool to the north of the cool store)	55	344518	5840938
5	Arthurs Creek at Arthurs Creek	55	341480	5838900
6	Arthurs Creek at Burke Road bridge, Arthurs Creek Road	55	340400	5834300



(Base map Vic Roads GIS Dataset © Vic Roads 2004 reproduced under licence)

Figure 2. Fish survey locations between Strathewen and Hurstbridge.

Gear types used for fish capture included the use of fyke nets and light traps.

All fish captured were identified and counted. The smallest and largest of each species was measured and weighed.

All field sampling was conducted under permit approvals from the Department of Primary Industries and the Department of Sustainability and Environment.

Appendix 1 shows a picture of each of the survey sites.

3.0 FINDINGS OF THE FIELD STUDY

Table 2 lists the aquatic fauna captured in this study.

No fish were captured in the Apted main dam (site 1).

The short finned eel was the only fish species captured in the Apted secondary dam (site 2). One silver perch (*Bidyanus bidyanus*) was also sighted in the dam. Long necked tortoises (*Chelodina longicollis*) and shrimp (*Paratya australiensis*) were also present.

Four native fish species were captured in Arthurs Creek, the short finned eel (*Anguilla australis*), river blackfish, common galaxias (*Galaxias maculatus*) and southern pygmy perch (*Nannoperca australis*). Two exotic species were present in Arthurs Creek, the eastern gambusia (*Gambusia holbrooki*) and roach (*Rutilus rutilus*).

Table 2. Aquatic fauna captured at each of the survey locations.

Site	Fish survey Technique	Fish captured (common name)	Fish captured (scientific name)	No. of fish	Length (mm)	Weight (g)	Bycatch
1	3 fyke nets	No fish					8 yabbies
	2 light traps						18 yabbies
2	2 fyke nets	short finned eel ^m	<i>Anguilla australis</i>	8	850-1020	2513 (largest)	6 long necked tortoises sighted 1 silver perch
	2 light traps	No fish					2 shrimp
3	2 fyke nets	short finned eel ^m river blackfish southern pygmy perch	<i>Anguilla australis</i> <i>Gadopsis marmoratus</i> <i>Nannoperca australis</i>	34 3 12	110-900 245-440 32-38	130-630 0.4-0.6	
	2 light traps	No fish					
4	1 fyke nets	short finned eel ^m river blackfish	<i>Anguilla australis</i> <i>Gadopsis marmoratus</i>	1 1	600 265	156	
	2 light traps	No fish					
5	2 fyke nets	short finned eel ^m southern pygmy perch eastern gambusia* roach*	<i>Anguilla australis</i> <i>Nannoperca australis</i> <i>Gambusia holbrooki</i> <i>Rutilus rutilus</i>	2 45 8 4	350-500 26-68 52-64	4.1-4.4 2.1-2.6	
	2 fyke nets	common galaxias ^m southern pygmy perch roach*	<i>Galaxias maculatus</i> <i>Nannoperca australis</i> <i>Rutilus rutilus</i>	8 11 1	15-37 32-71 58	125-165 0.4-4.2 2.1	1 shrimp
6	2 light traps	southern pygmy perch	<i>Nannoperca australis</i>	1	34	0.3	

^m migratory species, *exotic species.

4.0 DISCUSSION

4.1 Apted dams

Main dam

As the Apted main dam was treated with lime in May 2008, the capture of no fish in the dam was an expected finding. The lime dosing of the dam raised the pH so that any carp (*Cyprinus carpio*), that were formerly found in the dam, were killed.

Although carp currently appear to be absent in Arthurs Creek, the species could potentially recolonise in Arthurs Creek when it is reconnected to Diamond Creek during periods of streamflow. Future exclusion of carp from the main dam can only be guaranteed if water extracted from Arthurs Creek is filtered.

During the lime dosing of the main dam the raised pH (approximately 10) would have been lethal to fish. Over the following months the pH would have gradually been reduced and the current pH of 7.9 is acceptable for aquatic biota. The capture of yabbies in the dam and the presence of mayflies and backswimmers suggests that the food chain is developing. The dam could potentially be stocked with fish in the future.

Improvement to the dam could be made by planting fringing native vegetation which would reduce sediment inflow and improve water clarity. The establishment of some aquatic vegetation and the insertion of woody debris would assist with enhancing the aquatic habitat in the dam.

Secondary dam

The capture of short finned eels and long necked tortoises was made in the secondary dam. The presence of these species suggests that this dam is not likely to have dried out in the past few decades.

The dam supports a population of land locked large short finned eels (800-1100 mm in length), which could be 40-60 years old. These eels are suspected to have originally moved from Arthurs Creek to the dam during wet periods when the dam was overflowing (short finned eels can move through wet grass in search of new waterbodies). With no overtopping of the dam in recent decades, there has been no recruitment of small eels and mature eels have been prevented from moving back to Arthurs Creek and returning to the Coral Sea to spawn.

One silver perch was seen in the secondary dam which confirms that at least one of the fish stocked several years ago has survived. The secondary dam, like the main dam has potential for future fish stocking. Planting fringing native vegetation would reduce sediment inflow and maintain water clarity. The establishment some aquatic vegetation and the insertion of woody debris would also assist in improving aquatic habitat for fish in the dam.

Arthurs Creek

The capture of river blackfish at two locations adjacent to the Apted property (sites 3 and 4) shows that the species has persisted in Arthurs Creek despite a long period of flow cessation during the recent drought and also poor water quality inflows during the first flow event since the bushfires of February 2009.

Past pumping for the orchard has not resulted in the drying out of pools in Arthurs Creek, as the surveyed pools have continued to supported remnant populations of river blackfish. Unfortunately, as only moderate and large river blackfish (245-440 mm) are present, recruitment is expected to have been poor or non existent in recent times.

The absence of river blackfish at the sites surveyed at the Arthurs Creek township (site 5) and at Burkes bridge (site 6) suggests that if the species persists in Arthurs Creek downstream of the Running Creek confluence, numbers could be very low. Further survey is needed to determine whether river blackfish have disappeared between the Arthurs Creek township and Hurstbridge.

Apart from the river blackfish, other native fish captured in Arthurs Creek included the short finned eel, the southern pygmy perch (*Nannoperca australis*) and the common galaxias (*Galaxias maculatus*). Exotic fish captured included roach and eastern gambusia. All of these species have previously been recorded in Arthurs Creek (McGuckin, 2007).

5.0 CONCLUSION

Although no population of river blackfish was found in the Apted property dams, the dams could potentially support the species. Importantly, there is no exotic fish species present, which would compete for food or habitat. Low cost improvements could be made to further enhance the water quality and aquatic habitat of the dams.

Potentially, the Apted dams could be used for establishing a viable river blackfish population, one that could possibly be used in the future restocking of Arthurs Creek in the event that the species is lost from the creek (which is distinctly possible given that there are few fish remaining in the creek and recruitment has not occurred in recent times).

6.0 RECOMMENDATIONS

- water pumped from Arthurs Creek should be filtered to ensure that the main dam remains free of carp and other exotic fish species.
- fringing native vegetation, establishment of some aquatic vegetation and the insertion of woody debris would improve aquatic habitat in the main and secondary dams.
- opportunity exists for the Apted dams to be used in the conservation of river blackfish (an iconic species which may in the near future disappear from Arthurs Creek and possibly from the entire Diamond Creek catchment).
- moving large short finned eels from the secondary dam back into Arthurs Creek would be advantageous in lowering the predatory biomass in the dam and would provide opportunity for the eels to return to the ocean to breed.
- a fish survey of the Apted Kinglake property dam should be conducted (Streamline Research will do this at no cost) to determine whether river blackfish are present and if not, determine the potential of the dam as refugia for river blackfish.

7.0 ACKNOWLEDGEMENTS

I would like to thank Eric South for allowing Streamline Research the opportunity to survey the Apted property dams at Strathewen and for advising on the location of remnant pools in Arthurs Creek.

8.0 REFERENCES

McGuckin J. (2007). The existing drought and the fish fauna of the Diamond Creek catchment. Report prepared for Melbourne Water by Streamline Research.

APPENDIX 1. SURVEY LOCATIONS



Apted dam (site 1).



Apted secondary dam (site 2).



Arthurs Creek behind Apted property (site 3).



Arthurs Creek behind Apted property (site 4).



Arthurs Creek at Burkes bridge (site 6).