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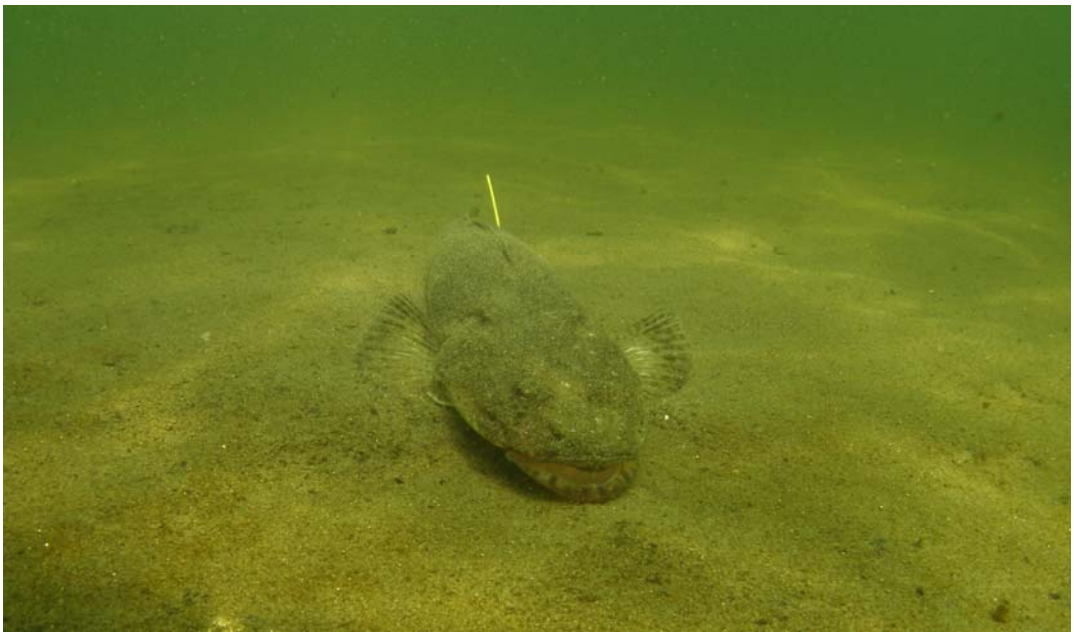
# Recreational Fishing Grant Program – Research report



# Gippsland Lakes dusky flathead tracking project: R/05/06/01`

**October 2008**

Victoria The Place To Be

# Gippsland Lakes dusky flathead tracking project: R/05/06/01

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**October 2008**

**Fisheries Revenue Allocation Committee**

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# Executive Summary

Dusky flathead (*Platycephalus fuscus*) have been designated as one of Victoria's iconic recreational species by Fisheries Victoria, and is a focus species in developing Fishery Management Plans for eastern Victoria's bays and inlets.

The pressure on dusky flathead by recreational fishers is not expected to decrease, especially given the increasing use of "soft plastic" lures (and the susceptibility of dusky flathead to capture). Information on the basic biology of this species is useful in designing the most appropriate management regimes.

Acoustic telemetry was used to document patterns of movement by dusky flathead throughout Australia's largest estuary, the Gippsland Lakes. Forty fish were surgically implanted with acoustic transmitters and monitored over 18 months (December 2006 to June 2008).

The rates of fish 'loss' in this study were around 25%. Overall, results of the present study suggest that many of the fish were largely sedentary, and remained in single regions of the Gippsland Lakes for extended periods (up to several months). This was particularly evident for fish tagged in the lower Lakes region, between Metung and Lakes Entrance. Fish appeared to spend most of their time in the Lakes. However, fish often moved into the lower and middle reaches of major tributaries such as the Tambo, Mitchell and Nicholson Rivers, and appeared to 'reside' in these regions for periods of up to several weeks.

Larger movements up to 30 km over two to three days were shown, but were not common. One fish moved from McLennan Strait to Lakes Entrance in December 2007, but did not exit the estuary.

During the large flood of June 2007, fish moved in subtle ways, with several fish moving to more saline regions of the Lakes, however, no fish were recorded to exit the Gippsland Lakes during this flood.

This is the first study to evaluate the movements of dusky flathead using acoustic telemetry. The generally limited movement of fish throughout this study suggests that a more spatially focussed program, undertaken at a scale of kms rather than 10s of kms, is required to better understand details on specific habitat affinities and identify likely spawning locations. Acoustic telemetry is suitable, however, in demonstrating how far and when fish move, and the results of this study provide valuable information that can be used in assessing population structure and broad-scale affinities for this species.

# Introduction

Dusky flathead (*Platycephalus fuscus*) are endemic to Australia, and occur between Cairns in Queensland and the Gippsland Lakes in Victoria (Kailola et al. 1993). Dusky flathead generally inhabit shallow bays and inlets, extending as far upstream in estuaries as the tidal limit. Dusky flathead occur over a range of shallow habitats, including mud, silt, gravel, sand and seagrass down to around 30 m depth. Spawning occurs in bays and estuaries, and in shallow, nearshore coastal waters, and may be linked to increasing day length and water temperatures; in Victoria spawning is thought to occur late November-February based on the timing of early post-settlement fish in shallow muddy inlets (J. Hindell pers. comm.). There has been little research on movement patterns of dusky flathead, although tag and release activities by sport fishing associations suggest movements over 100s of kms in less than 100 days are possible, and there is a trend for some northern movement of fish between NSW and Queensland (Kailola et al. 1993).

Dusky flathead are a key target species for recreational fishers throughout the Gippsland Lakes. In recent years, their catches have increased, partly as a result of their susceptibility to capture on artificial "soft plastic" lures (B. Geddes pers. comm.). The consequences of these higher catch rates on the sustainability of the fishery are unknown, but Fisheries Victoria implemented catch limits to guard against stock depletion. A bag limit of five dusky flathead per angler (only one of which could exceed 60 cm total length) was initially imposed as an interim arrangement in 2005, and has since been extended.

Lack of knowledge about the basic biology of dusky flathead severely hampers our ability to understand the consequences of environmental change on reproductive success and/or productivity of fish in the Gippsland Lakes. There are large gaps in our understanding of the preferred habitats, movement patterns, and spawning locations for dusky flathead in the Gippsland Lakes. The Gippsland Lakes are under increasing pressure from urbanisation and other forms of development. Unless we understand where dusky flathead live and breed in relation to the most impacted areas of the Lakes system, no amount of recreational fisheries management will ensure a productive and sustainable fishery in the future. Properly understanding the basic biology of dusky flathead, including critical habitat, movements and spawning locations are the key to implementing the most appropriate strategies to ensure the sustainability of this important species for recreational fishers throughout eastern Victoria.

The Nicholson Angling Club have a strong record of working with scientists from the Department of Primary Industries and Department of Sustainability and Environment on research projects to assess movements and habitat preferences of black bream in the Gippsland Lakes. The research on movements of black bream in the Gippsland Lakes has been highly successful, with much coverage in local newspapers and interest in the general community. Given the acoustic tracking infrastructure set up throughout the Gippsland Lakes, there was an exciting and valuable opportunity to build on previous work focusing on black bream and assess movements and habitat preferences of other iconic recreational species, such as dusky flathead.

*Figure 1. Dusky flathead (*Platycephalus fuscus*) caught be a recreational fisher. Picture J. Hindell.*

## Purpose and need

The primary purpose of this project was to increase understanding of the broad-scale habitat preferences and movement patterns of dusky flathead within the Gippsland Lakes. This information is critical in understanding how the reproductive success and productivity of dusky flathead may be influenced by changes to the environment from pollution and habitat loss. This project provided a unique opportunity to add value to an existing study (*Tracking the movements of black bream in the Gippsland Lakes*).This project also provided recreational fishers with

opportunities to participate in research projects and learn more about what determines the health of fish populations and the habitats that sustain them.

*Figure 2. A juvenile dusky flathead. Picture J. Hindell.*

More specifically, the present project had five objectives:

1. Increase knowledge of the biology (including movement patterns and habitat preferences) of dusky flathead.

2. Increase capability in educating members of the local fishing community and the general public, and improved potential to attract anglers based on a strong background in science as well as fishing

3. Improve fishing opportunities for dusky flathead through the provision of management regimes for the sustainable management of dusky flathead based on detailed biological information – including the protection of valuable habitats.

4. Demonstration that acoustic telemetry methods can be applied successfully to dusky flathead.

5. Increased communication of project findings via the *Fishtrack* website.

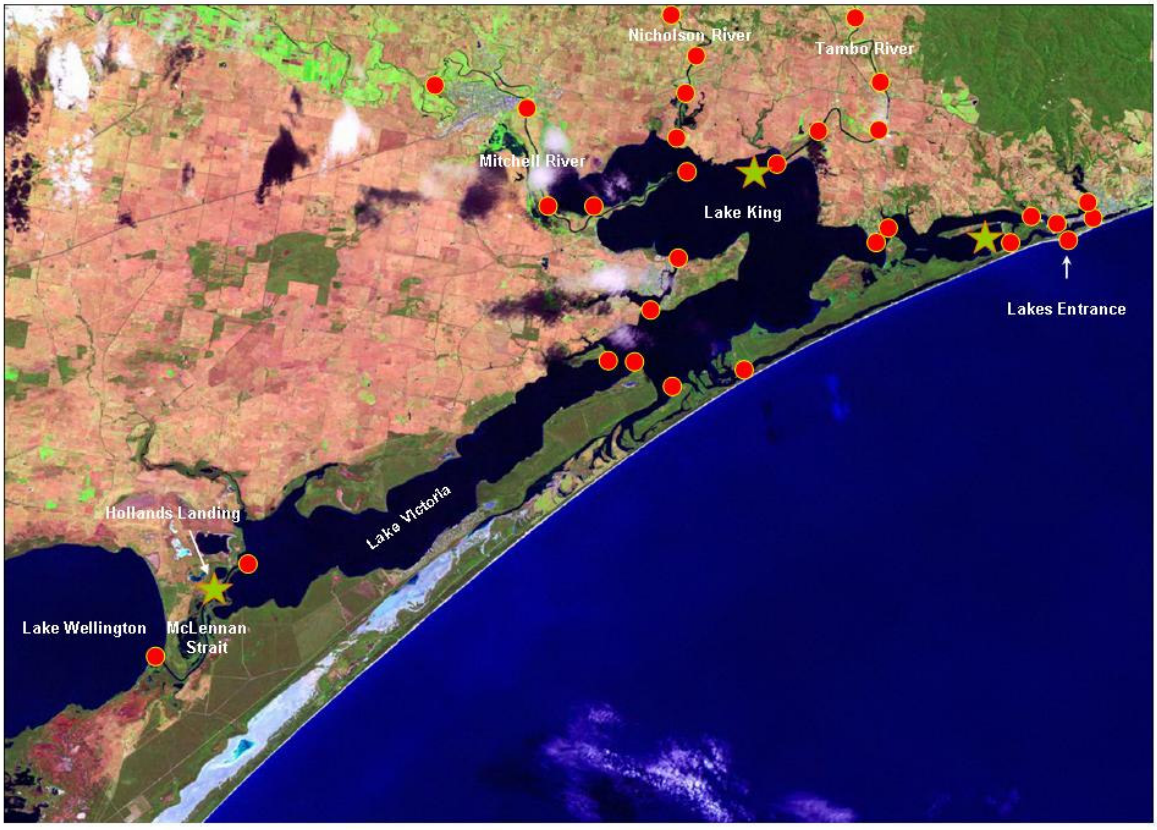
# Methods

## Study Region

The present study was conducted in the Gippsland Lakes, south eastern Australia (Figure 3). The Gippsland Lakes are a network of temperate coastal lakes, marshes and lagoons covering an area of about 600 $km^2$. The Gippsland Lakes has a small tidal range of around 30 cm, and is connected to the open ocean by an artificial channel at Lakes Entrance.

Lake Wellington, Lake King and Lake Victoria are the largest of the lakes in the study area. There are five major tributaries entering the Gippsland Lakes; two in the west (the Avon and Latrobe rivers), and three feeding the central basin of Lake King (the Mitchell, Nicholson and Tambo rivers). The Gippsland Lakes are around 70 km long, forming the largest navigable network of inland waterways in Australia, and (with associated wetlands) is recognised under the Ramsar Convention as a site of international importance, supporting rare, endangered and vulnerable plants and animals.

*Figure 3. Locations of acoustic receivers and areas within which fish were tagged and released. Red circles = acoustic receiver. Green star = release location of fish.*

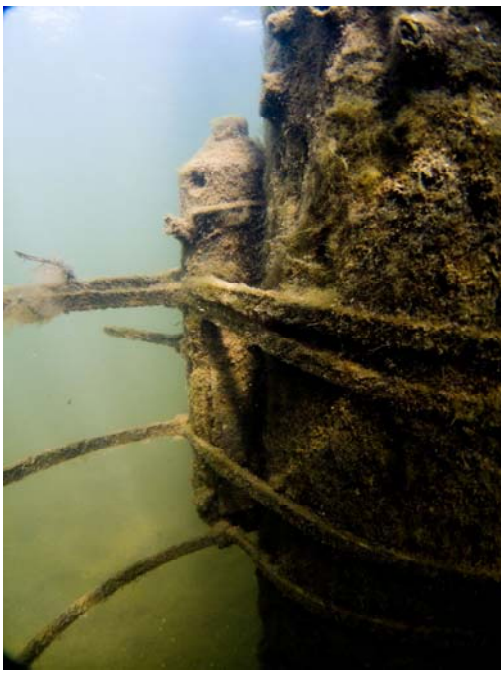



## Selection of study sites and application of acoustic telemetry

Acoustic receivers (VEMCO, VR2) were used to detect and record information from ultrasonic (69 kHz) signals emitted by acoustic transmitters in real time. Thirty receivers were placed strategically throughout the Gippsland Lakes, from Lakes Entrance to the western end of McLennan Strait (Figure 3). Within the Lakes, receivers were located to separate the study area into five broad regions. Within each of the Tambo, Nicholson and Mitchell rivers, receivers were placed upstream to distances of around 15 km from the entrance to the lakes.

Receivers were attached underwater to available structure (such as woody debris or navigational piles) with plastic cable ties at depths between two and three metres. Sensitivity analyses showed that acoustic receivers were able to detect acoustic transmitters (implanted within fish) at distances of up to 400 m in the rivers and 600 m in the lakes, even during periods when environmental variables, such as strong winds (increasing water turbulence), may interrupt the detection of acoustic signals.

*Figure 4. Acoustic receiver attached underwater to the pole of a navigational marker. Picture J. Hindell.*



Three types of data were recorded and stored when a tagged fish swam within the range of an acoustic receiver: 1) number of visits; 2) total time of visit; and, 3) number of hits. The number of visits represents the number of times that a fish has visited a receiver over the course of the study. For example, a fish that is detected at a receiver, moves outside the detection range of a receiver, and then returns, would have two visits recorded. The theoretical minimum time between visits depends on the transmission delay of the acoustic transmissions from the transmitters (tags), which in the current study were set to occur randomly between 30 and 60 seconds. The total time of a visit (or visits), over the course of a study represents the total time elapsed (in seconds) between the initial and final detection for a given visit (and is summed over all visits). The number of hits represents the number of times a given transmitter is detected within a single visit. For example, if a transmitter is set to transmit once every 30 seconds, and a fish remains in the vicinity of a receiver for two minutes, four 'hits' will be recorded. This information was uploaded to a computer after a period of time and plotted to show exactly where and for how long fish had been in particular regions of the Lakes.

## Tagging fish

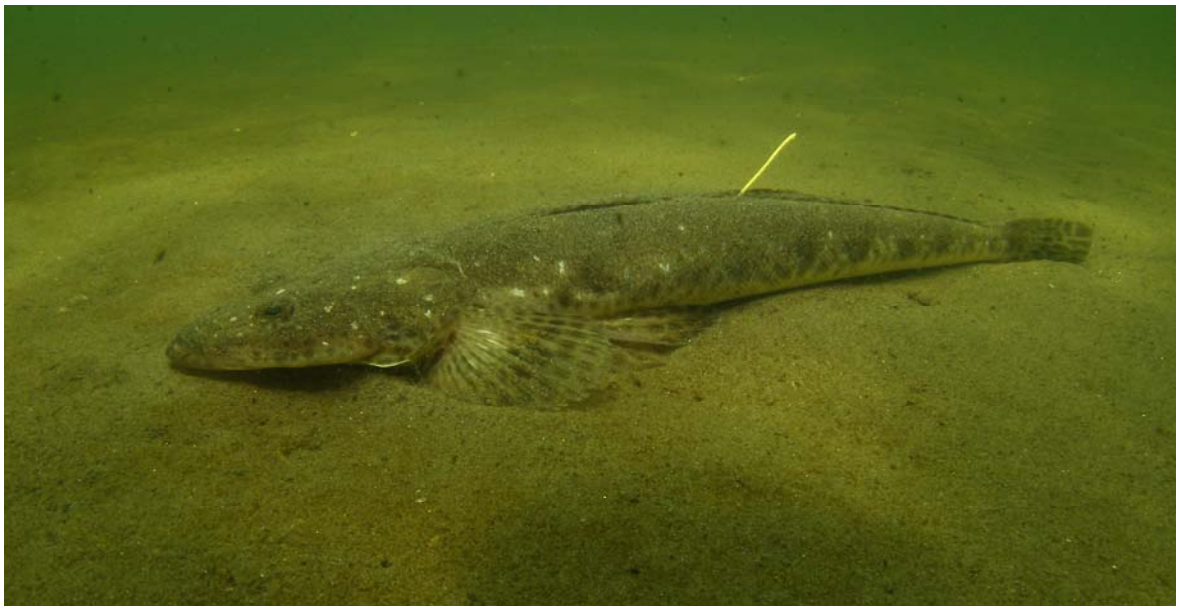
The methods for catching and tagging dusky flathead follow those for black bream published by Hindell (2007). Briefly, fish for tagging were caught using recreational (baited hook) and commercial methods (mesh net). Only lip-hooked fish were retained for tagging because of the high mortality of fish that swallow hooks (S. Conron unpublished data). Fish were tagged at three broadly different locations within the Gippsland Lakes to avoid potential effects of release location on movements: Lower lakes (Potty Point), Lake King (and tributaries) and McLennan Strait (Hollands Landing) (Figure 3). Fish were also tagged in a number of batches through time to ensure that adequate numbers of tagged fish were present in the study area over 12 months; the tag manufacturer only guaranteed 300 days of battery power for the acoustic transmitters used here.

Fish were first anaesthetised to stage III sedation (Ross & Ross 1999) with Benzocaine (2 g in 10 l of estuarine water), and the fork length (FL, mm) and weight (g) of each fish was recorded. A single, individually-coded, acoustic transmitter (VEMCO V9-2L coded, random signal delay 20 to 60 seconds) was

inserted into the peritoneal cavity via a 2-3 cm off-centre ventral incision in the body-wall, which was then 'closed' with two to three simple sutures (Braided Polyglycolic Acid Suture, 3/8 circle, USP 3/0). The sutures were sealed with cyanoacrylate adhesive, being careful to minimise direct contact with the skin of fish in case of irritation (Jepsen et al. 2002). All fish were also tagged with external anchor tags (T-bar), which were inserted into the dorsal musculature adjacent to the dorsal fin. Once tagged, the wound areas of fish were swabbed with antiseptic, and fish were placed in a square (70 × 70 × 70 cm) holding net in water to recover. Once fish were able to maintain balance, they were released close to the point of capture.

*Figure 5. Implanting an acoustic receiver in the peritoneal cavity of a dusky flathead. Picture J. Hindell.*

*Figure 6. A dusky flathead released after tagging. Picture J. Hindell.*



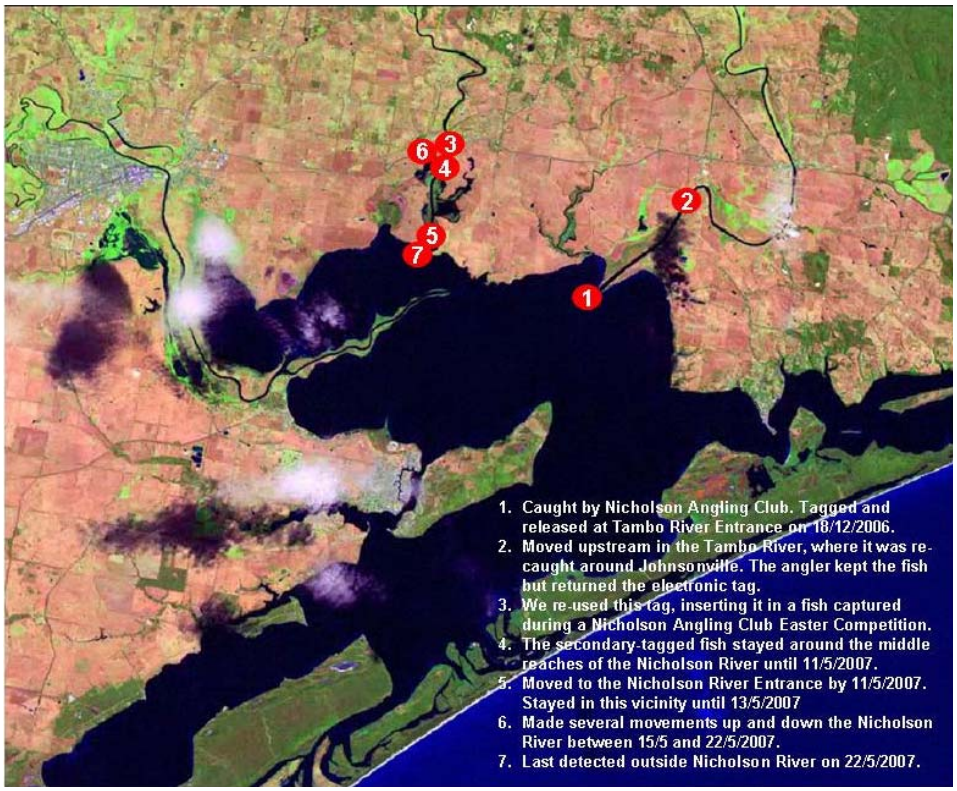
# Results and Discussion

The results of the present study indicate that dusky flathead are a largely sedentary species, intermittently capable of moving larger distances (> 30km) in periods of days. The fish tagged in this study did not undertake movements outside the Gippsland Lakes.

The rate of fish 'loss' in this study was around 25% - that is, 25% of the dusky flathead that were tagged were not recorded subsequently. There are three possible scenarios to explain these patterns: 1) fish died after surgery; 2) fish moved to areas of the Gippsland Lakes within which they could not be recorded (i.e. to regions of the Lakes where there were no acoustic receivers); or, 3) fish were captured by fishers but not reported. It is suspected that the rate of fish mortality may have been slightly higher than that previously recorded for bream, which had only 2% mortality (Hindell 2007). However, some fish that were detected within a single area (at a single station) for up to five months were found to eventually move to another area, so it is possible that fish not yet detected may simply be residing in areas where there was no acoustic coverage.

Fish were shown to use the rivers intermittently throughout the study, sometimes spending days to weeks within the lower to middle reaches of major tributaries such as the Tambo, Mitchell and Nicholson Rivers. Most fish, however, spent the majority of their time in the Lakes. One fish tagged in the Mitchell river remained in the vicinity of the area in which it was tagged (the Mitchell river cut) for up to two months, before moving to the Mitchell river entrance. Following brief movements to other areas, this fish returned to the Mitchell cut (Figure 10). Similarly, fish tagged and released in the Nicholson river remained in this river for three months before departing; during this time the fish moved to the river entrance and back to the middle region of the river several times (Figure 7). Dusky flathead also used the Tambo River but, like fish use of the Nicholson, this was largely restricted to the lower half of the estuary.

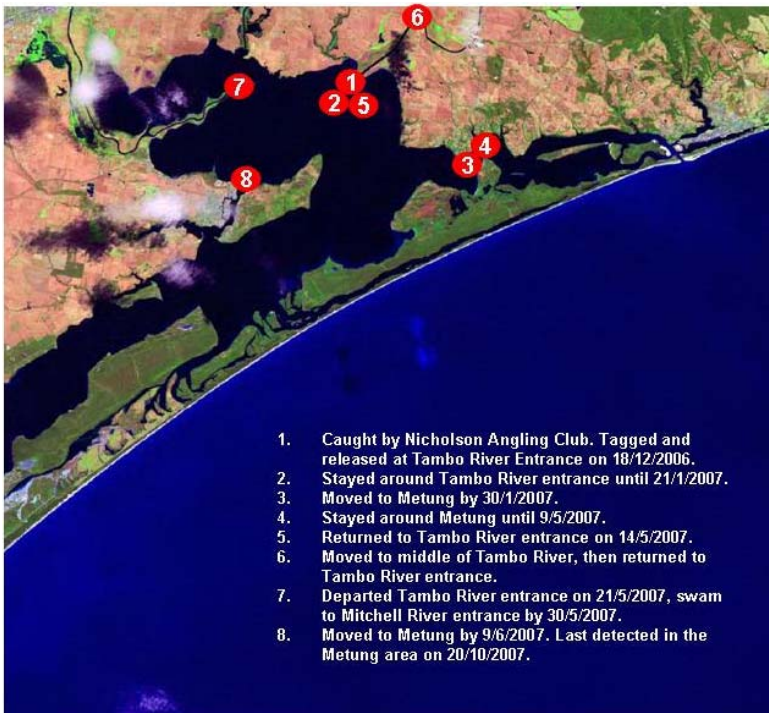
*Figure 7. Movements of fish 4852. Tagged and released at entrance to Tambo River.*




The flood of 2007 appeared to have little impact on the movements of fish, with several fish remaining in the lower reaches, presumably in deeper water between Lakes Entrance and Metung. No fish (including black bream studied as part of another project) were observed to exit the Gippsland Lakes during this flood event.

These data support the idea that dusky flathead are a largely sedentary species and, while they may move in response to strong environmental perturbations (in this case a 1 in 100 year flood), their movements are 'conservative'.

*Figure 8. Movement patterns of fish 4853. Tagged and release at entrance to Tambo River.*




Several fish appeared to move from regions further inside the lakes (such as McLennan Strait) towards regions closer to the entrance (e.g. Lakes Entrance) around November and December (Figure 9), with one fish possibly exiting the Gippsland Lakes around this time (see Table 1). The collection of dusky flathead post-settlement juveniles in Mallacoota Inlet between December and March (J. Hindell unpublished data) demonstrates that this species may spawn in late spring/early summer. Consequently, some of the movements observed here could have occurred in response to spawning, which may occur inside the Lakes in the vicinity of Lakes Entrance.

Most fish were detected infrequently on the array of acoustic receivers set up throughout the Gippsland Lakes. The same array had previously been used to monitor patterns of movement by black bream, with most bream being recorded daily (Hindell 2007). The much lower number of detections recorded in the present study for dusky flathead meant that daily or weekly movements of fish were rarely measurable at the scale over which the receivers had been placed. Additionally, it was almost impossible to determine fine-scale temporal patterns related to time of the day or tide from such 'patchy' data. Consequently, it was not possible to separate the extent to which fish were truly sedentary (i.e. remained in a single location for extended periods of time) versus highly mobile but limited in their movements (i.e. frequent excursions over scales of 100s of ms to kms). Given that the general method of acoustic telemetry appears to work for dusky flathead, future studies should ensure that greater numbers of acoustic receivers are placed in regions of a larger system such that small but (potentially) continuous movements by fish can be monitored. In the case of the Gippsland Lakes, increasing the number of acoustic receivers in the lower Lakes, between the Entrance and Metung, with focal areas around the minor inlets would provide a better assessment of the scales of movement by dusky flathead.

The present study provided opportunities for directly addressing three of the five initial objectives. Firstly, the Nicholson Angling Club has built a strong reputation as a leading and innovative angling club in east Gippsland, and has secured a number of high profile angling competitions as a result. In doing so, members of the Nicholson Angling Club have continued to work with DSE and DPI to promote the importance of science-based management in sustainable fisheries and conservation. Secondly, the *Fishtrack* website (http://www.dpi.vic.gov.au/vro/fishtrack) was again shown to be a valuable method of communicating

science to the general public, and there are opportunities to expand this site to include freshwater tracking studies, the current VICTAG program, and future marine and estuarine projects. Thirdly, the present study documented that acoustic telemetry can be applied to dusky flathead to better understand movement patterns. Importantly, this study clearly demonstrated that the scale of movement by an animal must be assessed before existing acoustic arrays are automatically adopted. While this study went some way towards providing information to support the fourth and fifth objectives of increasing knowledge of movement patterns and habitat preferences, and thereby guiding management regimes to improve the sustainability of the fishery, the study was ultimately not able to deliver information on fine-scale movements, which, as above, should be an area of focus for the future.

*Figure 9. Movement patterns of fish 4893. Tagged and released at Hollands Landing.*

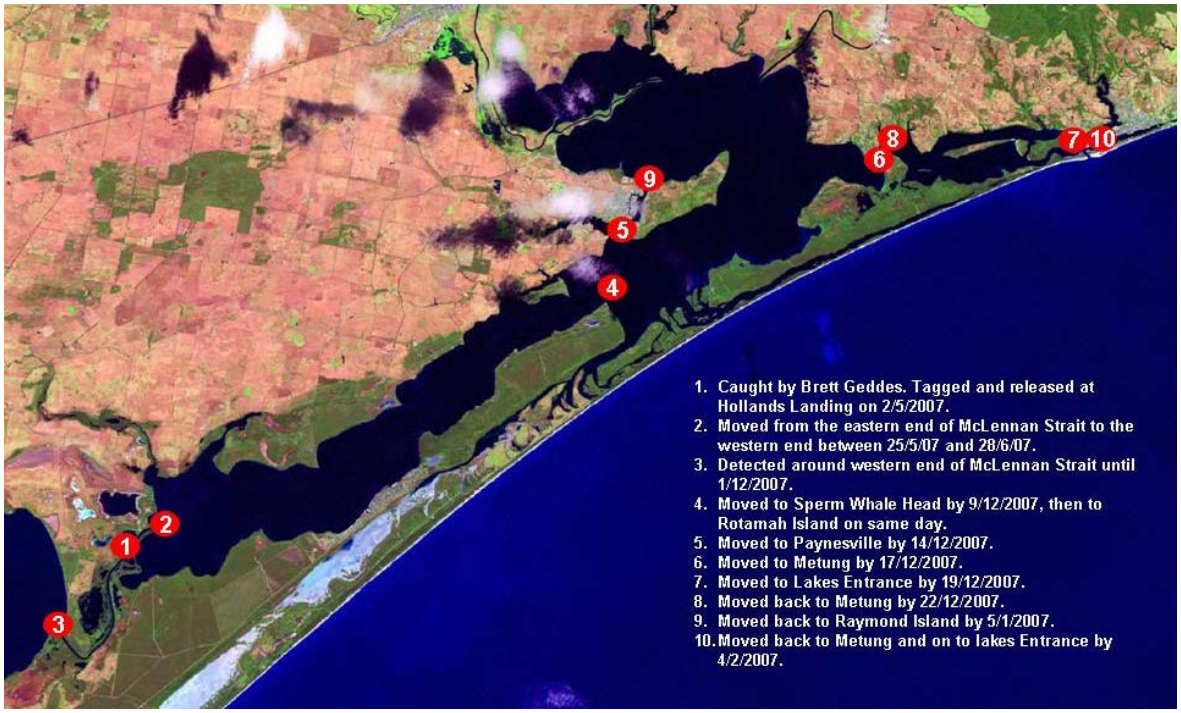


*Figure 10. Movement patterns of fish 4831. Tagged and released in Mitchell River.*

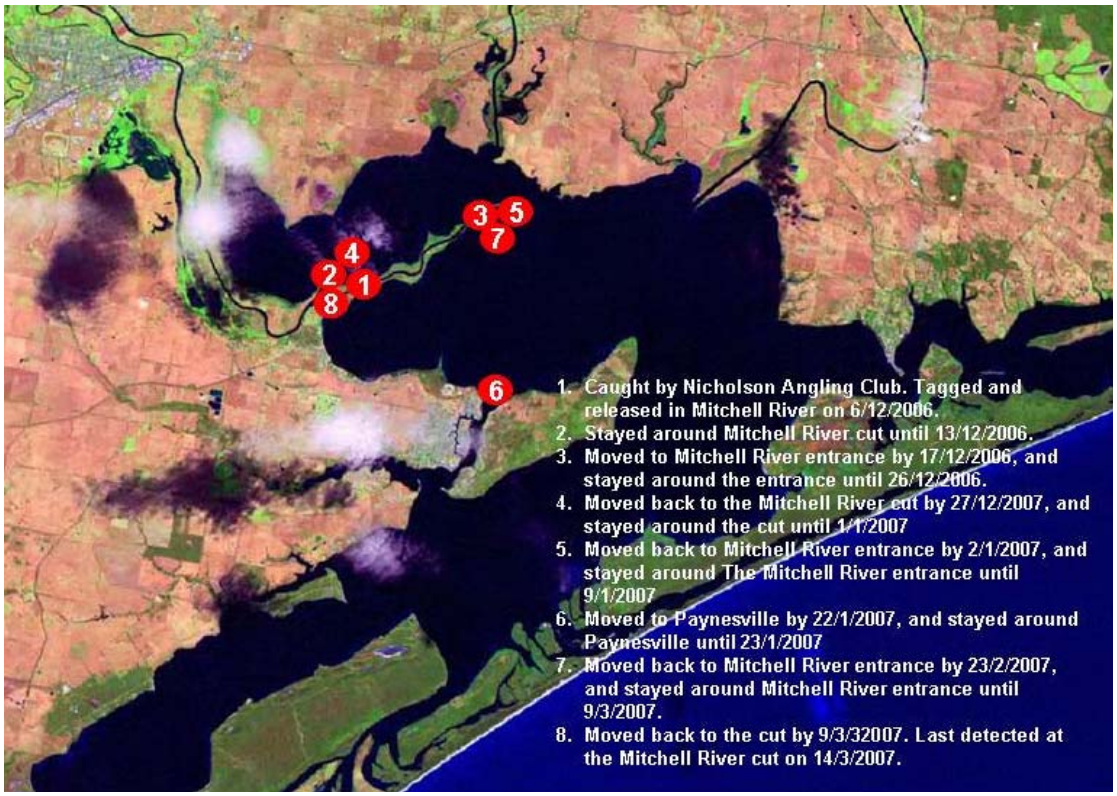


*Table 1. Summary of catch details and movements by dusky flathead throughout the Gippsland Lakes. Details shown only for those fish that were detected.*

| Date of release | Total Length (mm) | Weight (g) | Location of release | External Tag # | Summary of movements |
|---|---|---|---|---|---|
| 17/01/2007 | 480 | 722 | Potty Point | 4823 | Only detected in bottom lake around point of release. |
| 17/01/2007 | 460 | 555 | Potty Point | 4820 | Detected around point of release until December 2007. Then swam towards entrance via main channel. Detected at entrance for several days at end of December 2007, then swam back to original point of release via bottom channel. |
| 17/01/2007 | 495 | 700 | Potty point | 4819 | Only detected around point of release. |
| 17/01/2007 | 435 | 534 | Rigby Island | 4818 | Only detected around point of release. |
| 17/01/2007 | 680 | 2102 | Potty Point | 4821 | Detected around Potty Point until 4/6/2007. Moved to Lakes Entrance by 13/6/2007. Moved back to Reeve channel on 13/6/2007, and detected here until 16/8/2007. Moved back to Potty Point by 28/8/2007. Detected here until 16/3/2007. |
| 17/01/2007 | 530 | 943 | Potty Point | 4822 | Detected around Potty Point until 3/6/2007. Moved to Lakes Entrance and not detected again after 4/6/2007. Possibly moved out of the Gippsland Lakes. |
| 16/03/2007 | 440 | 548 | Mitchell River cut | 4860 | Stayed around the entrance to the Mitchell River, where it was last detected 18/5/2007. |
| 8/04/2007 | 440 | 530 | Nicholson river | 4880 | Stayed around the middle reaches of the Nicholson River until 11/5/2007. Then moved to the Nicholson River Entrance by 11/5/2007. Stayed in this vicinity until 13/5/2007, then returned to middle of Nicholson River by 15/5/2007. Returned to the Nicholson River entrance on 20/5/2007. Then returned to middle of Nicholson by 22/5/2007. Last detected outside Nicholson River on 22/5/2007. |
| 2/05/2007 | 375 | 340 | Hollands Landing | 4900 | Moved from McLennan Strait to sperm whale head between 23/9/2007 and 15/12/2007. Stayed around Sperm whale head until 23/12/2007. Then moved to Metung by 27/1/2007. |
| 2/05/2007 | 440 | 570 | Hollands Landing | 4898 | Only detected around McLennan Strait east. |
| 2/05/2007 | 430 | 560 | Hollands Landing | 4893 | Moved from the eastern end of McLennan Strait to the western end between 25/5/07 and 28/6/07. Detected around the western end of McLennan Strait until 1/12/2007. Then moved to Sperm Whale Head by 9/12/2007. Then moved to Rotamah Island on same day. Then moved to Paynesville by 14/12/2007. Then moved to Metung by 17/12/2007. Then moved to Lakes Entrance by 19/12/2007. Then moved back to Metung by 22/12/2007. Then moved back to Raymond Island by 5/1/2007. Then back to Metung and on to lakes Entrance by 4/2/2007. |
| 2/05/2007 | 430 | 520 | Hollands Landing | 4895 | Detected around the eastern end of McLennan Straits until 15/6/2007. Then moved to Bunga Arm by 13/12/2007. Then to Paynesville by 16/1/2008, and then to Reeve Channel by 29/1/2008. |
| 2/05/2007 | 430 | 520 | Hollands Landing | 4894 | Only detected around the eastern end of McLennan Straits. |
| 2/05/2007 | 480 | 650 | Hollands Landing | 4899 | Stayed around the eastern end of McLennan Straits for the entire period. Last detected in this area on 9/6/2008. |
| 2/05/2007 | 480 | 640 | Hollands Landing | 4897 | Stayed around release location until 24/6/2007. Then swam rapidly to Sperm Whale Head by 17/7/2007. Returned to release location by 24/7/2007. |
| 6/12/2006 | 350 | 285 | Mitchell river boat ramp | 4831 | Stayed around Mitchell River cut until 13/12/2006. Then swam to Mitchell River entrance by 17/12/2006. Stayed around the entrance until 26/12/2006. Then swam back to the Mitchell River cut by 27/12/2007. Stayed around the cut until 1/1/2007, then swam back to Mitchell River entrance by 2/1/2007. Stayed around The Mitchell River |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | entrance until 9/1/2007, then swam to Paynesville by 22/1/2007. Stayed around Paynesville until 23/1/2007, then swam back to Mitchell River entrance by 23/2/2007. Stayed around Mitchell River entrance until 9/3/2007, then swam back to the cut by 9/3/32007. Last detected at the Mitchell River cut on 14/3/2007. |
| 18/12/2006 | 470 | 730 | Tambo river entrance | 4855 | Stayed around release location until 26/3/2007. |
| 18/12/2006 | 435 | | Tambo river entrance | 4858 | Stayed around release location until 13/2/2007. |
| 18/12/2006 | 440 | 480 | Tambo river entrance | 4856 | Stayed around release location until 25/2/2007. |
| 18/12/2006 | 435 | 450 | Tambo river entrance | 4852 | This fish moved upstream into the Tambo River, where it was re-caught around Johnsonville. The angler kept the fish but returned the electronic tag. We re-used this tag, inserting it in a fish captured during a Nicholson Angling Club Easter Competition (see Fish 4880, above). |
| 18/12/2006 | 335 | 320 | Tambo river entrance | 4851 | This fish spent most time around the Tambo River entrance. Made a few brief movements to the middle of Tambo River. Not detected again after leaving the Tambo river entrance on 21/4/2007. |
| 18/12/2006 | 380 | 350 | Tambo river entrance | 4853 | Stayed around Tambo River entrance until 21/1/2007. Then swam to Metung by 30/1/2007. Stayed around Metung until 9/5/2007, then returned to Tambo River entrance on 14/5/2007. Moved to middle of Tambo River, then returned to Tambo River entrance. Departed Tambo River entrance on 21/5/2007, swam to Mitchell River entrance by 30/5/2007, then moved to Metung by 9/6/2007. Last detected in the Metung area on 20/10/2007. |
| 18/12/2006 | 415 | 450 | Tambo river entrance | 4854 | Moved from Tambo River entrance to Mitchell River entrance on 1/2/2007, and not detected since. |
| 18/12/2006 | 420 | 505 | Tambo river entrance | 4857 | Only detected around Mitchell River entrance, where this fish stayed for several months up until 12/7/2007. |

# Conclusions

This is the first study to use acoustic telemetry to document movement patterns of dusky flathead (*Platycephalus fuscus*). Survival rates of tagged and released fish were at least 70%. Fish showed a variety of movement patterns; some individuals moved broadly, while others were detected infrequently within a single region of the study system. Some individuals moved towards the more marine waters of Lakes Entrance in early summer, which may coincide with spawning activity. While the results of this study suggest that dusky flathead are a largely sedentary species, future studies should focus attention on separating truly sedentary behaviour (i.e. remain in a single location for extended periods of time) from short, frequent movements. The present study built on the work done on assessing the movements of black bream, and was shown to be an important method of engaging recreational and commercial fishers in science. The results of this study provide data to support stock assessments for dusky flathead in the Gippsland Lakes, and will support the sustainable management of this species in the future.

# Acknowledgements

This project was funded by the Victorian Government using Recreational Fishing Licence fees. The Nicholson Angling Club and Jeremy Hindell (the project team) worked closely to successfully deliver this project. The project team thanks B. McKenzie, B. Womersley, G. Jenkins and A. Pickworth for assistance with field work. Thanks also to various members of the Nicholson Angling Club and B. Geddes for their help catching fish for tagging. J. Koehn and J. Lyon provided valuable comments on earlier drafts of the manuscript. The care and use of fish in the present study complies with all relevant local animal welfare laws, guidelines and policies, and the relevant approval for this study was granted through the Department of Primary Industries Animal Ethics Committee and Fisheries Victoria.

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# Appendix 1

MEDIA MONITORS
INCISIVE INSIGHT

Weekly Times
28/11/2007
Page: 91
General News
Region: VIC Circulation: 73000
Type: Rural
Size: 465.75 sq.cms
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# New light on dusky flathead


WHEN it comes to my favourite fish, the dusky flathead is close to the top of the list.

The flathead doesn't have a lot going for it when it comes to looks and fighting ability.

In fact, a big dusky caught over mud can be the colour of liquorice, and about as ugly to boot.

Nor are flathead the fastest or toughest fish you'll encounter.

The attraction of flathead to me is the ability to sight-fish for them in clear, shallow water.

I get a buzz out of spotting a fish and then flicking a lure or fly over it and watching it rise to the offering.

Dusky flathead can have a bit of size to them and 5kg flathead are sometimes caught at places such as Mallacoota Inlet.

Therefore, anything I can learn about the habits and movement of this species is worthwhile, which is why I find new research being undertaken in the Gippsland Lakes of value.

The research is providing insight into the movement patterns of the estuary's dusky flathead population, something that Ian Prosser, acting executive director of Fisheries Victoria, said would contribute to the sustainable management of the species.

Mr Prosser said scientific findings from the acoustic tracking project would help both anglers and fishery managers better understand the distribution and movement of dusky flathead in the estuary under various habitat and environmental conditions, and could be used to underpin management decisions about the species.

Last year, the Nicholson Angling Club received an $86,500 grant from the Recreational Fishing Licence Trust Account to tag and track dusky flathead over two years.

The club has been working in partnership with Dr Jeremy Hindell, a senior estuarine ecologist with the Department of Sustainability and Environment.

Between December last year and May this year, 35 dusky flathead were caught and implanted with acoustic transmitters.

Fish were gathered throughout the Gippsland Lakes system, from Fraser Island, near the entrance in the east, to Hollands Landing, in the west.

The smallest flathead measured 33cm long and weighed 320g, the biggest fish was 68cm long and weighed 2.1kg.

The fish are being tracked with the help of 40 "listening stations" that record any acoustically tagged fish swimming by.

"Our research to date reveals that 80 per cent of the flathead have travelled no more than 10km from the point at which they were tagged and released," Dr Hindell said.

"A few flathead have been a little more adventurous, with the most travelled flathead, a 38cm specimen originally captured by a Nicholson Angling Club member for tagging, moving significant distances in short periods of time."

This fish was tagged and released at the mouth of the Tambo River and, in January this year, swam from there to Metung in just two hours, a distance of about 80km.

Dr Hindell said the flathead stayed at Metung until early May and then swam back to the mouth of the Tambo River over five days before moving upstream to Johnsonville.

In late May it returned to the mouth of the Tambo briefly before swimming to Metung via Jones Bay in the northern part of Lake King.

These acoustically tagged dusky flathead carry an external yellow streamer tag so they can be identified.

They join more than 1000 flathead in the Gippsland Lakes that have been streamer tagged by VicTag volunteers.

Dr Hindell said that fisheries scientists expect to see flathead movements escalate over the warmer months so anglers should be on the lookout for tagged fish, taking note of the tag numbers and reporting a find.

• Steve Cooper can be heard on the *Casting Off* program on Radio Sport927 between 4.30am and 6.30am on Saturdays.

# Appendix 2

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# Radio-tracking flathead in Gippsland Lakes

**An $86,000 grant will assist in tracking the movement of dusky flathead in the Gippsland Lakes.**

Minister Responsible for Fisheries, Bob Cameron, announced the grant alongside the Nicholson River with the president of Nicholson River Angling Club, Peter Ross, and researcher, Dr Jeremy Hindell, fro the Department of Primary Industries.

"This grant will allow the angling club to work with DPI researchers to better understand the movement and behavior of dusky flathead," Mr Cameron said.

"This information will provide valuable knowledge for managing the long-term sustainability of the dusky flathead population in the Gippsland Lakes.

"Fish move for a variety of reasons, including spawning, feeding and to avoid unfavorable conditions.

"Tracking movements of fish enables scientists to identify valuable fish habitat and important breeding grounds and also determine how fish are likely to respond to changes n the environment."

Mr Cameron said the project was one of 25 across Victoria funded through the Recreational Fishing Grant Program, which invests recreational fishing licence revenue into projects that support the state's anglers.

"The projects funded in this round are worth more than $1.2 million and brings the value of projects funded by the Recreational Fishing Grant program to more than $6 million since it was initiated in 2001."

Dr Hindell said a similar research project, to investigate the movement patterns of black bream throughout the Gippsland Lakes, began in December 2004.

"Anglers from the Nicholson Angling Club and commercial fishers helped to catch 69 black bream for tagging. Each fish was implanted with an acoustic transmitter (pinger) that emits an ultrasonic sound," he said.

"Fixed receivers (listening stations) listen for the pings and record and store the time, date and identity of the fish as they swim past.

"The biggest advantage of acoustic tagging over traditional tagging methods is that fish do not have to be re-caught to provide information on their movements - fish only have to be 'heard' by a listening station.

"The bream tagging study has provided a unique insight to the secret lives of fish, which in turn gives us valuable information on which to base fishery management decisions.

"In little more than a year, one black bream, 'number 1225', was found to have travelled more than 3,200 kilometres, mostly up and down the Nicholson, Tambo and Mitchell Rivers.

"Such was the success of the break tracking study, members of Nicholson Angling Club were keen to see the research program expanded to include other species, such as dusky flathead."

**Zach Smith (ALP candidate for Gippsland East), Peter Ross (president Nicholson Angling Club), Jeremy Hindell (DPI researcher) and Minister Responsible for Fisheries, Bob Cameron, in Nicholson last week at the launch of the radio-tracking device for dusky flathead.** (PS)