

Estuary perch – discussion paper and options for future fishery development

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Estuary perch - *Macquaria colonorum* (Gunther, 1863) is a fish native to south eastern Australia. This species ranges from Northern NSW (Richmond River) to South Australia (Murray River). There is an extant population in Tasmania at Arthur River and whilst there is evidence that a population at Ansons Bay existed till the 1960's there are no other confirmed records of estuary perch populations in Tasmania.

It could be hypothesised that the range of estuary perch pre European colonisation was quite extensive and may have occurred along the north and east coasts of the state. The construction of barriers to migration in rivers such as hydroelectricity dams, weirs and road fords would have been detrimental to the existence of viable populations of this species. The use of nets in estuaries, previously wide spread in Tasmania would have also been caused a depletion of stocks further exacerbating this species vulnerability.

The species has been recorded to 75 cm in length and 10 kg in weight but is commonly smaller than this with most fish caught in fisheries (recreational and commercial) between 400 grams and two kilograms.

The estuary perch can occur in lagoon/lake environments as well as rivers and estuaries. Most commonly found in tidal waters, but also occurs in rivers and lakes with salinities less than 1-2 ppt. They predominantly feed on small fishes, molluscs, worms, shrimps and other crustaceans. During late winter through to early summer (July and December) they move to the mouth of estuaries to breed. Estuary perch produce pelagic eggs that hatch in 2-3 days. Males reach maturity at a length of about 22 centimetres; females at about 28 centimetres (Fishbase, 2014).

“Adults spend all their life in brackish water although young fish (1-3 years old) have been found in freshwater on occasions. Adults usually live in low salinity waters in the upper reaches of estuaries but move into higher saline water (19,000 EC) during July to December to spawn. Spawning starts earlier in Gippsland in July but not until mid-October to early November in western Victoria. Eggs are laid on submerged rocks and beds of aquatic plants” (<http://www.depi.vic.gov.au/fishing-and-hunting/education/fish-species/estuary-perch>).

“The later sites are important 'nursery areas' and carry an abundance of fingerling estuary perch. Their food supply is of particular importance to anglers as it gives a clue as to best baits. Fish remains formed 50% of the contents of stomachs examined during a major study by the Department between 1975 and 1980. Other food items were prawns and shrimps, which were found in 41% of all stomachs. It was concluded that estuary perch are mainly surface and mid-water feeders during winter and bottom feeders during summer” (<http://www.depi.vic.gov.au/fishing-and-hunting/education/fish-species/estuary-perch>).

Historically the recreational fishery for estuary perch has been characterised as a by-catch fishery where anglers capture estuary perch whilst fishing for other species, such as bream and trout in Tasmania and Australian bass and estuarine species in mainland Australia. The surge in popularity of sports fishing in Australia, particularly for bream (*Acanthopagrus* spp.) has led to an enthusiastic

band of sport fishers who specifically target estuary perch. Estuary perch being largely piscivorous (fish eaters) are prone to being caught by lure and fly fishers but are also captured using baits such as worms and prawns.

Whilst estuary perch are a great sport fish they are also reputed to be a good table fish. In Tasmania there is currently a zero bag limit imposed on the taking of estuary perch largely due to the restricted range of the species to the Arthur River.

The Victorian estuary perch stocking program

<http://www.depi.vic.gov.au/fishing-and-hunting/recreational-fishing/fish-stocking/inland-estuary-perch-fisheries>

In 2000 there were attempts to establish stocks of estuary perch in inland lakes in Western Victoria. Lake Hamilton and Quiet Lakes were stocked with a few thousand estuary perch fingerlings. Further stocking of estuary perch were not undertaken due to logistical difficulties and high production costs. Fish from this stocking event have been since caught in low numbers whilst Department of Environment and Primary industries (DEPI) surveyed Lake Hamilton during 2012 and were found to be up to 47 cm in length (Forster, 2014).

The Victorian DEPI embarked on an estuary perch stocking program in 2010. Five stages of the program were: 1. Secure funds into research and to purchase fingerlings. 2. Identify and secure approval to stock suitable lakes. 3. Find an experienced fish farmer to develop breeding methods for estuary perch. 4. Collect ripe brood fish for fingerling production. 5. Establish and evaluate the recreational fishery through stocking and monitoring (Forster, 2014).

The collection of brood stock for the estuary perch stocking program in Victoria has centred on “the Great Perch Search”. The collection involves gathering together keen and experienced bream and estuary perch tournament anglers and local fishers and focusing on the Hopkins and Glenelg rivers in Western Victoria for a group fishing effort (IFS Director John Diggle attended one of the brood stock collection events). The brood stocks collected during these events were flown to Narooma Aquaculture in NSW by chartered aircraft.

From the 120 fish that were collected as brood stock from the Western Victorian rivers DEPI have stocked 117,740 estuary perch fingerlings into seven waters identified by the program as being suitable for an estuary perch stocked fishery (Forster, 2014).

The majority of the fingerlings stocked as part of this program were stocked during December 2013. The earliest stocking of the current program was during January 2012 at Lake Bolac with 7,000 one gram fingerlings being used. Follow up monitoring of this stocking has shown that in 18 months these fish averaged 25 cm in length (Forster, 2014). This is the size that fish would be considered to have become part of the fishery.

The Victorian DEPI website (link at start of this section) indicates that the program is funded through Victorian government’s Recreational Fishing Initiative (\$100,000) and Victorian fishing licence fees (\$150,000).

Narooma Aquaculture's website shows that estuary perch fingerlings (25 millimetres in length) are available for purchase between November and January at a price of \$250 per 100 fish with an indication of discounted rates for large orders (<http://www.narooma-aquaculture.com.au/Products.htm>).

Tasmanian possibilities

There are two issues that involve estuary perch in Tasmania.

1. Conserving existing population (s) of estuary perch, including the possibility of re-establishing now extinct historically known populations.
2. Establishment of a stocked estuary perch fishery at suitable waters.

Conserving existing stocks and re-establishing extinct populations

Currently there is only one confirmed extant population of estuary perch in Tasmania at the Arthur River in the northwest of the state. There is one confirmed extinct population at Ansons Bay of which there is a preserved specimen from a 1962 capture archived at the Tasmania Museum and Art Gallery. There are 'rumours' of other estuary perch populations in Tasmania and many anecdotes that suggest the range of estuary perch extended across the North and East coasts. A specimen was believed to have been caught at the Detention River in 2012, anecdotal reports of them being present at Pipers River before an instream weir was established during the early 1900's and reports of fisherman netting them in good numbers from the Scamander River are examples of such 'evidence'.

The absence of estuary perch from many of the state's waters can be in a large part attributed to the building of weirs, dams and other instream barriers to migration. Estuary perch require uninhibited access to estuarine sections of rivers in order to spawn and successfully recruit to the population. The Arthur River provides for this migration requirement, whereas Ansons Bay has a weir/ford that would have impeded access by the fish to its' spawning grounds and return of juvenile stocks to the upper reaches of the river. It is not known if the culverts now present under this bridge would permit adequate migration for estuary perch to maintain a self-supporting population should one be re-established.

The use of netting as a gear type in recreational fishing would not have helped in maintaining estuary perch stocks in Tasmania. Netting was widely practiced in estuaries and inshore bays through much of the 1900's. Estuary perch are very susceptible to gill netting owing to their body structure.

The restriction on recreational netting in modern times would mean less pressure on stocks in terms of fishing induced depletion; however where there are extant instream barriers the prospects of maintaining a self-sustaining population would be very low.

The Inland Fisheries Service instated a zero bag limit on estuary perch in 2010. This regulation was imposed in recognition of the species restricted range in Tasmania and thus the need to protect the Arthur River population.

A student from the Australian Maritime College, Bryan Van Wyk is intending to conduct his honours project on the Arthur River estuary perch population from October 2014 to July 2015. A preliminary project plan for Mr Van Wyk's study has been submitted to the IFS. The study has the potential to provide good baseline information about the Arthur River population. Of particular interest for further development of a wild fishery and re-establishment of extinct populations in Tasmania is the genetic aspect of the study.

A study of the genetic diversity and distribution of estuary perch has been recently published and indicates low genetic diversity but two broad stock types within Australian estuary perch stocks (Shaddick et al, 2011). There is recognition that the populations of estuary perch south of the Clyde River in NSW through to the Murray River in South Australia is genetically distinct enough to represent a stock separation from a northern group that is evident from the Shoalhaven River to the Richmond River in NSW (Shaddick et al, 2011).

Mr Van Wyk's study may provide further information to assess the genetic similarities between western Victorian and Tasmanian stocks of estuary perch. If these stocks are genetically similar as has been suggested (Shaddick et al, 2011), it may be possible to utilise the western Victorian originated fry available from Narooma hatchery in Tasmanian efforts to re-establish extinct populations.

If there are questions about the genetic integrity of imported stocks of estuary perch or there are biosecurity issues then the Arthurs River population remains the only source of fish for re-establishment. A thorough assessment of the Arthur River population would be required before consideration of any removal of fish from there for use in re-establishment of other populations. It is possible that Mr Van Wyk's study could be used for such assessment but further surveys may also be required.

Re-establishment of former/extinct populations of estuary perch such as the one known at Ansons Bay would require removal of any impediments to migration in order to restore a self-sustaining population in addition to a restocking program.

Establishment of a stocked estuary perch fishery at suitable waters

The Victorian DEPI model of stocking estuary perch outside of their historical range is something that could be considered for Tasmania.

Whilst currently some coastal lagoons in Tasmania are stocked with brown and rainbow trout with changing climatic conditions the suitability of salmonids for these locations will come into question. The estuary perch is ideally suited to coastal lagoons particularly those that were within the specie's historical range i.e. the north and east coasts of Tasmania. Coastal lagoons generally have good populations of *Galaxias* spp., *Retropinna tasmanica* and other small fish (juvenile mullet and gobies) that estuary perch would feed on.

The following needs to be considered for a stocked estuary perch recreational fishery in Tasmania.

- Identification of suitable stock to be used for a Tasmanian program. I.e. Tasmanian stock from the Arthur River or imported stock from genetically similar hatchery originated stock.

- Conducting a risk assessment from a biosecurity standpoint of imported stocks to the Tasmanian environment including risks posed to the salmonid industry and recreational fishery.
- Identify funding avenues for the establishment and longer term sustainability of a stocked estuary perch recreational fishery.
- The feasibility of the culture of estuary perch in a Tasmanian hatchery.
- Identification of suitable waters for stocking estuary perch (not inclusive of re-establishing extinct populations). E.g. Coastal lagoons such as Blackmans Lagoon in north eastern Tasmania.
- Development of a stocking program that will be suitable to sustain a recreational fishery for estuary perch in Tasmanian inland waters.
- Establishing a management regime that would sustain a stocked estuary perch fishery through its development phase. I.e. regulations that would allow fish to grow to sustain the recreational fishery.
- Establish a monitoring program of waters stocked with estuary perch.

References

Fishbase, 2014. <http://www.fishbase.org/summary/Macquaria-colonorum.html>

Forster, A. 2014. Freshwater perch, Victoria's latest recreational fishery campaign. Freshwater Fishing Magazine. 128: 18-22.

Shaddick, K., Gilligan, D.M., Burrige, C.P., Jerry, D.R., Truong, K., and Beheregaray, L.B. 2011. Historic divergence with contemporary connectivity in a catadromous fish, the estuary perch (*Macquaria colonorum*). Can. J. Fish. Aquat. Sci. 68: 304-318.

Attachment: Forster, A. 2014. Freshwater perch, Victoria's latest recreational fishery campaign. Freshwater Fishing Magazine. 128: 18-22.