UPPER RIVER TORRENS LANDCARE GROUP

Data Sheet

Freshwater Fishes

of the Mount Lofty Ranges

Part (c)

Exotic Fish

This sheet aims to:

- *Help you identify and understand the seven exotic fish species of the Mount Lofty Ranges.*
- *Highlight the problems and impacts associated with these species.*
- *Provide possible options for their control.*
- *Point you in the right direction for more information and involvement.*

The Mount Lofty Ranges (MLR) is separated into two drainage divisions:

➨ **South Australian Gulf Division (western side of the MLR)**

➨ **The tributaries within the Murray Darling Basin (eastern MLR)**

This sheet forms part of the *Watercourse Management-a Field Guide* available from the URTLG and is the third of three data sheets dedicated to the freshwater fishes of the MLR. This sheet provides information about exotic fish of the region, also commonly referred to as introduced or feral species. Use this sheet in conjunction with others in the series which feature:

(a) South Australian Gulf Division (Approx. 18 species (estuarine species use freshwater for part of their life cycle))
(b) Murray Darling Basin in South Australia (twenty six species)
(c) Exotic Fish in the MLR (seven species)

Waterways in question...

The MLR encompasses waterways of the South Australian Gulf Division and the Murray Darling Basin (MDB). Information provided regarding exotic species is relevant to these and other South Australian aquatic environments and consequently this sheet is more broadly applicable to the fresh waters of South Australia. Seven exotic species can be found in this region. Fish have been photographed on plain backgrounds to highlight the fact that they are introduced, compared to the other data sheets depicting native fish in natural habitat.

The effects of introduced fish...

As we become more aware of the uniqueness of our local aquatic environments, and of the threats to them, the problems associated with exotic fish are becoming obvious. The introduction of foreign components to aquatic systems has the potential to alter natural ecosystems and food webs. For example the smaller and often highly variable waterways of the Mount Lofty Ranges are inhabited by a select group of smaller species which have evolved there naturally. The introduction of larger predatory species such as Redfin and Trout can be particularly damaging. Different species can be problematic in different regions and it is becoming more difficult to find areas free from introduced species. This is partly due to past practices as well as lack of awareness regarding native species and aquatic ecosystems. Degraded environments may favour and assist the establishment of introduced species. Exotic species can provide indicators of habitat degradation, environmental change and poor waterway health. Recognising threats and undertaking restoration offer a path to help return native species and more natural waterways.

The problem with introduced fish...

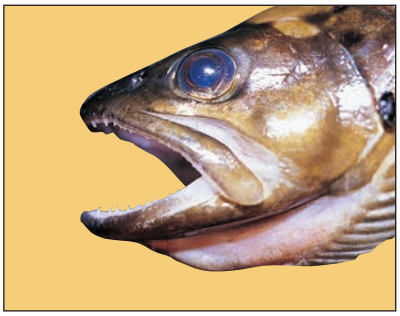
Most exotic fish are prolific breeders and under the right conditions can quickly displace native species. The effects of different introduced species can vary in certain environments (e.g. streams vs wetlands). The problems caused can be categorised as follows:

A degraded stream in the Mount Lofty Ranges ID&A

- **Predation:** Smaller native fish, the juveniles of larger species, yabbies, tadpoles and frogs as well as other invertebrates, are targets for introduced predators.
- **Competition** between native and aggressive exotic species for food and resources can lead to the exclusion of native fish.
- **Behavioural changes:** Native fish have been forced to alter their behaviour, for example, by changing to different habitat, different foods and feeding times. This does not provide the optimum conditions for reproduction and growth and can slowly lead to the loss or increased vulnerability of populations.
- **Habitat modification:** The habits of exotic species, such as Carp, can increase turbidity and destroy aquatic vegetation.
- **Disease and parasites:** Local species have low immunity to the diseases, viruses and parasites carried by exotic species.

What to do if you find an exotic fish…

Currently under the *Fisheries Management Act 2007* **it is illegal to return any exotic species to the water.** This includes: using them as bait, stocking into dams that overflow into waterways, or release of fish into waterways. They must be disposed of humanely. Remember that native fish belong in their natural environment and are adapted to life under the water. The best method to identify fish is to briefly observe the specimen (e.g. in a bucket, or clear portable housing), then return the native species to the water as quickly as possible.



Jaws of a trout *MH*

How to ID fish…

The appearance of fish varies greatly with different locations and habitat, along with different sizes and life history. Use the photos and information provided as a guide to identification and consult the references provided for further information. You can also use habitat type as a clue to what species you might find.

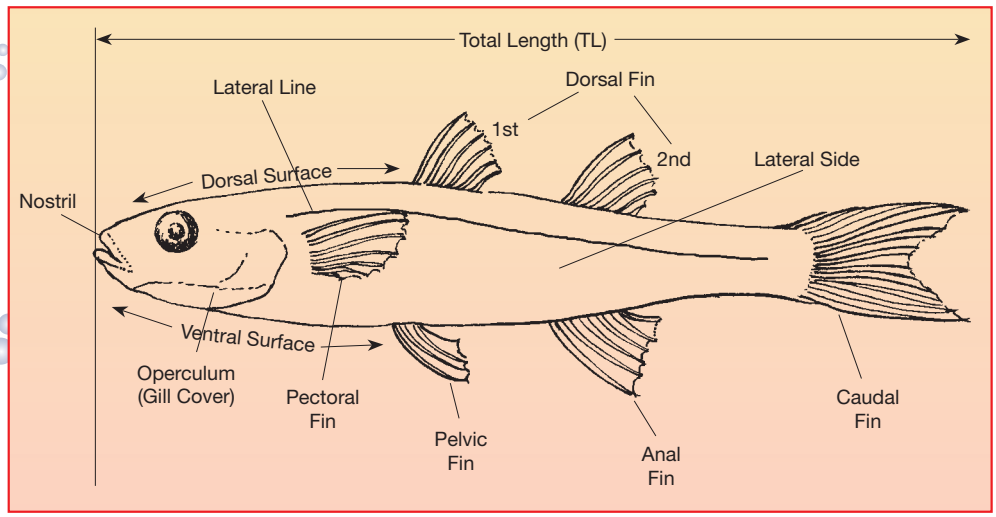


Fig. 2 Fish Body Features *Illustration by Kathleen Munn*

More terms and other fish body features…

Adipose Fin: Small fleshy dorsal fin (present in Smelt and Trout).
Barbels: Thin, finger-like projections near the mouth (e.g. Catfish, Carp).
Benthic: Bottom-dwelling; associated with the substrate or snags.
Fecundity: Reproductive term for the number of eggs produced.
Fragmented: The isolation of populations from each other.
Gonopodium: A specialised reproductive structure, part of the anal fin of male Gambusia.
Holistic: Embrace all aspects, a thorough approach.

Common Carp *(Cyprinus carpio)*

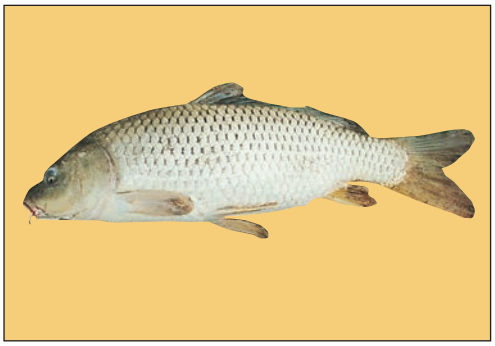
Also known as European Carp. Koi is a genetic variant of the Carp.

Size: TL max 120 cm, common 30-40 cm

Introduction: Originates from Asia, spread into Europe. A number of strains have been introduced. Became widespread in the lower Murray in the 1970s.

Tricks with ID: Two pairs of barbels (only one is obvious), large scales, single dorsal fin.

Ecology and impacts: An omnivore, the feeding method of Carp can be destructive, especially in delicate wetlands and smaller waterways: sifting for particles and invertebrates in sediment can increase turbidity and also damage aquatic vegetation. They produce a high number of eggs (in the order of 100,000 to 1 million), grow quickly and can tolerate poor environmental conditions. Carp are highly invasive and can be an indicator of degraded areas. Juveniles feed on zooplankton, which combined with the resuspension of sediments may increase the chance of algal blooms. Carp carry a number of diseases and parasites.



Common Carp *MH*

Control options: There is much research currently in place investigating exclusion barriers for Carp, and this may be a management option. Actively target and remove this species from local waterways.

Goldfish *MH*

Goldfish *(Carassius auratus)*

Also known as Golden Carp or Crucian Carp.

Size: TL max 40 cm, common 10-20 cm

Tricks with ID: No barbels, slightly upturned mouth and a forked tail. Goldfish generally revert to a bronze colour in waterways.

Introduction: Native to Asia. Widely established as an aquarium species.

Ecology and impacts: Goldfish are invasive and compete with smaller native species for food. Goldfish frequently carry exotic diseases and parasites. Problematic in wetlands and are prominent in urban areas.

Control options: Prevent their escape into local waterways, ensure garden ponds can't overflow and do not release unwanted aquarium species (either return them to an aquarium store or dispose of them humanely). The use of this species as bait is to be discouraged. Goldfish can quickly become established and may lead to poorer catches of native species in the future.

Hybridisation between Carp and Goldfish occurs. They look largely like Carp but can take a variety of forms.

Tench *(Tinca tinca)*

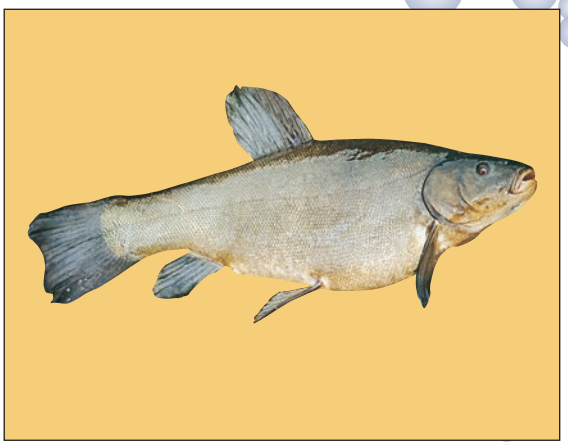
Size: TL max 70 cm, common 30-40 cm

Tricks with ID: A stocky fish with a single high dorsal fin, a pair of small barbels and a distinctive orange eye.

Introduction: Originating from Europe, Tench were once widespread in the MLR but have declined after the establishment of Carp.

Ecology and impacts: A carnivore feeding on crustaceans, aquatic insects and molluscs, Tench can muddy the water in searching for food. Tench have very high fecundity. With wide environmental tolerances, in combination with its potentially large size and similar diet to native species, Tench compete with native fish. Although limited in distribution, their presence may have contributed to the recent local extinction of a population of River Blackfish in the MLR.

Control options: Actively target this species.



Tench *MH*

Redfin *MH*

Redfin *(Perca fluviatilis)*

Also known as European Perch.

Size: TL max 50 cm, common 20-30 cm

Tricks with ID: Large mouth (see front cover), slightly forked caudal fin, dark vertical bands on the body and red fins.

Introduction: Introduced from Europe and is widely established in the MLR.

Ecology and impacts: Its large size and predatory nature are a danger to native species, particularly Pygmy Perch, Gudgeons and yabbies. Redfin have a high fecundity and their eggs are unpalatable to other fish. Populations often become dense and consequently individuals become stunted. Redfin carry a virus damaging to native species.

Control options: Actively target Redfin and don't translocate them into dams. Public education is a key to controlling redfin as they are still widely regarded as a native species. Redfin are a very damaging introduced species.

Rainbow Trout *(Oncorhynchus mykiss)*

Size: TL max 78 cm, common 30-40 cm

Tricks with ID: Has an adipose fin, spots on the tail and often with a pink flank. Males have a hooked jaw.

Introduction: Native to North America. Often introduced into the MLR from local Trout hatcheries under permit through the *Fisheries Act 1982*.

Ecology and impacts: Trout are largely stream fish, preferring cooler environments such as those found in headwaters of MLR waterways. They grow many times larger than the local native species in these regions and are an active predator. (The impact of Trout in these regions can be equated to the damage caused by species such as Carp in wetlands.) Predation of native fish (particularly Galaxias), tadpoles and invertebrates can alter local ecosystems and fragment populations. Despite this knowledge they are still widely introduced for angling, even in conservation areas and waterways where endangered species occur.

Control options: Although Trout are not the only threat to local waterways, their release is an action which can be controlled.

Rainbow Trout *MH*

Brown Trout *MH*

Brown Trout *(Salmo trutta)*

Size: TL max 70 cm, common 30-40 cm

Tricks with ID: Large mouth with sharp teeth, body spots (but not on the tail) and an adipose fin. Males have a longer hooked jaw.

Introduction: Native to Europe, regularly stocked into the MLR from local hatcheries under permit through the *Fisheries Act 1982*.

Ecology and impacts: Trout are detrimental to local stream ecosystems (Galaxias are particularly vulnerable). The predatory nature of these introduced species is a threat to several endangered species interstate. Local spawning of Trout is reported, but not documented.

Control options: A review of stocking practice and local impacts would be beneficial, as would the establishment of specific areas for native fish conservation. Despite their impacts on native fauna, the government has recently declared trout 'a valuable introduced species'.

Male (Top) & Pregnant Female Gambusia *MH*

Eastern Gambusia *(Gambusia holbrooki)*

Also known as the Plague Minnow. The name 'Mosquitofish' applied to this species is misleading and its use is discouraged.

Size: TL max 6 cm, common 2-4 cm

Tricks with ID: Has a small, upturned mouth, and a single dorsal fin. Females generally have a dark patch above the anal fin. Males are smaller and possess a gonopodium.

Introduction: Originally native to Mexico. It has been considered a mosquito control agent, but we have now learned that this species offers no better control than native fish species. In natural water bodies native fish and invertebrates generally control mosquito larvae. Other sources such as water-containing pots and tyres offer more likely mosquito breeding grounds.

Ecology and impacts: Many native species migrate to the surface soon after hatching and are vulnerable to predation by Gambusia. It is aggressive towards fish species (fin nipping and competition for food), tadpoles and invertebrates, including natural mosquito predators. Gives birth to live young and consequently can reproduce rapidly, particularly in still, warm and degraded environments.

Control options: Habitat improvement and restoring environmental flows to reduce favourable areas for Gambusia may help native fauna. Actively target this species and encourage public education to phase out the use of the name 'Mosquitofish'.

The Oriental Weatherloach *(Misgurnus anguillicaudatus)* is an invasive species, which is problematic in the regions of the MDB and Landscape SA H&F and is now found all the way to the Lower Lakes. Prevention rather than control is the best tactic for this and other unwanted exotic species in South Australia.

What you can do...

There are a number of small steps and practices which you can adopt to help control exotic fish and help to restore the balance of our aquatic environments. Data sheets part (a) and (b) highlight general principles to help aquatic environments and in relation to exotic fish you can:

- Learn to recognize your local fish species, target and remove exotic species: it is illegal to translocate or release exotic species.
- Provide a healthy environment e.g. exclude stock, replant riparian vegetation and increase habitat diversity (see data sheets (a) and (b)).
- Let others know which species are exotic and educate them as to the dangers they pose to aquatic environments: public education is a key to controlling exotic species.
- Ensure that the problems of exotic fish are addressed in aquatic restoration programs.
- Don't stock translocated fish in dams or garden ponds which can overflow into a local waterway.
- Don't use exotic fish species as bait.
- Don't release aquarium fish or plants into our waterways.
- Get involved with community environmental groups such as Landcare (see list on this page).

Management and more information...

Several groups and programs have legal responsibilities and stewardship within this region and many local Landcare groups and community organisations also have an aquatic focus. Contact these groups and use the references provided to increase your knowledge and make a difference for native fish in South Australia by helping to manage exotic fish species.

- **Upper River Torrens Landcare Group Inc:** PO Box 418, Birdwood SA 5234 (http://www.torrenslandcare.org/)
- **Landscape SA Boards:** https://statewide.landscape.sa.gov.au/
- **Native Fish Australia (SA):** https://www.nativefish.asn.au/home/page/NFA-South-Australia
- **Nature Glenelg Trust:** http://natureglenelg.org.au/

References

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Hammer et al (2009), *Action Plan for South Australian Freshwater Fishes,* Native Fish Australia (SA).

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Illustration by K. Munn

Rutherfurd, Jerie and Marsh (1999), *A Rehabilitation Manual for Australian Streams*, LWRRDC and CRC for Catchment Hydrology, Canberra, Australia.
URTLG (2020) (4th Edition), *Watercourse Management - a Field Guide*, URTLG Inc, Birdwood, South Australia.

Resources

https://landscape.sa.gov.au/hf/plants-and-animals/native-plants-animals-and-biodiversity/native-animals/fish

Data ID & Collection Apps

- BDBSA Collect (DEW): https://biocollect.ala.org.au/
- iNaturalist: https://www.inaturalist.org/
- South Australian Museum Field Guide to South Australian Fauna

Acknowledgements

- Text: Michael Hammer & Gerry Butler
- Proofreading: Gerry Butler, Sue Forrest and Melanie Hibbert
- Photos: Michael Hammer (MH)
- Printing and Layout: Ariel Printing (Mike and Fran Close)
- Funding for these data sheets has come from the Natural Heritage Trust and the Mount Lofty Ranges Catchment Program, (now Landscape SA H&F), Michael Hammer and Native Fish Australia (SA).
- Also supported by LAWNads and the River Murray Catchment Water Management Board (now Landscape SA M&R).
- Nick Whiterod (Aquasave–NGT) (2020 updates).
- This 2020 production was funded by the Hills and Fleurieu Landscape SA Board

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