



Module 4:

How to identify tilapia

Objectives

- Participants will be able to confidently identify Mozambique tilapia and distinguish them from native fish species
- Participants will become familiar with the procedure for reporting sightings of tilapia

Intended participants

- All stakeholder groups

Key messages

- It is important that a large proportion of the community knows how to correctly identify tilapia
- If you spot a tilapia—report it!

Learning resources

- PowerPoint
- Pest fish identification field guide
- Pest fish communication material
- Learning activities
- Handouts—pest fish report examples
- Online information on tilapia:
 - <www.fisheries.qld.gov.au> and search for 'tilapia identification' or
 - <www.dpi.nsw.gov.au> and search for 'tilapia'





How to identify tilapia

Typical habitat

Tilapia can be found in a variety of habitats, including reservoirs, lakes, ponds, rivers, creeks, drains, swamps and even tidal creeks and estuaries. They usually live in mud-bottomed well-vegetated areas, and are often seen in loose aggregations or small schools. Tilapia mainly inhabit slow-flowing rivers and streams and still-water habitats.



Figure 4.1 Slow-flowing and well-vegetated habitats where tilapia are often found

Traces

Male tilapia build circular nests or pits in sandy or muddy substrates using their mouths as bulldozers. The nests are usually found in clusters and should not be confused with the breeding nests built by eel-tailed catfish (*Tandanus tandanus*), which are larger, usually built in coarser gravel substrate and not generally found in large clusters or series.



Figure 4.2 Mozambique tilapia nests (top) in comparison with eel-tailed catfish nests (bottom) bottom photo courtesy of Kate Engledow, DERM

Distinguishing features

An easy way to distinguish a pest fish from a native fish is by looking at the dorsal fin. Pest fish usually have a continuous dorsal fin, while native fish have a dent or gap separating the front of the dorsal fin from the rear.

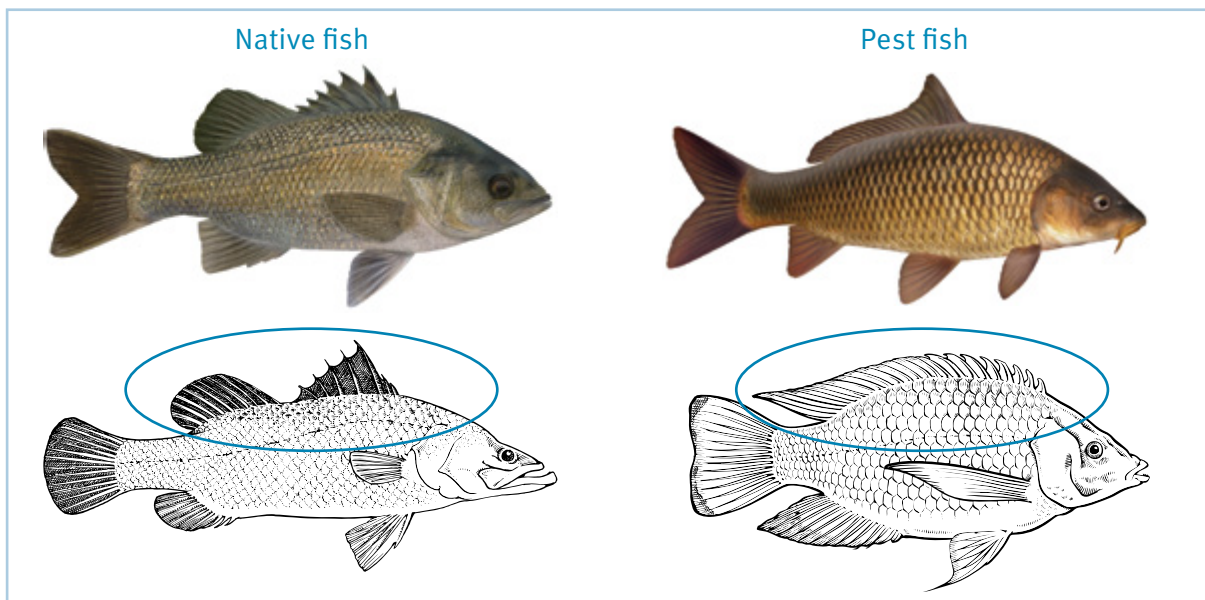


Figure 4.3 The major distinguishing feature between native fish and pest fish is usually the dorsal fin
top right photo courtesy of NSW DPI

Mozambique tilapia are generally a deep-bodied fish with a thin profile and can usually grow up to 40 cm in length. They are mostly dark in colour but can appear silver with two to five dark blotches or spots on the side. Breeding males can have red tips on their fins. The caudal fin is truncate with rounded corners. Juveniles have a small black spot at the rear of the base of the dorsal fin (this is not present in all small-sized tilapia, as stunted adults may be the same size as some juveniles) and may have vertical banding on the body. They have a long snout and pronounced lips or jaw (especially in older males). The dorsal fin is single and continuous, originating near the head and ending with an extended point. The dorsal and anal fins are almost symmetrical.



Figure 4.5 Mozambique tilapia male (top) and female (below)



Figure 4.4 Juvenile Mozambique tilapia



Figure 4.6 Male Mozambique tilapia
photo courtesy of Gunther Schmida





Tilapia are commonly confused with...

Barred/banded grunter (*Amniataba percoides*)



Figure 4.7 Barred grunter (*Amniataba percoides*) (top) are commonly confused with Mozambique tilapia (*Oreochromis mossambicus*) (bottom)



Major differences from tilapia include:

1. dent separating front of the dorsal fin from the back
2. end of the dorsal fin is rounded.

Figure 4.8 Barred grunter (*Amniataba percoides*)
photo courtesy of NSW DPI

Bream (*Acanthopagrus* spp.)



Major differences from tilapia include:

1. forked caudal fin
2. end of dorsal fin is rounded.

Figure 4.9 Yellowfin bream (*Acanthopagrus australis*)



Figure 4.10 Mozambique tilapia (*Oreochromis mossambicus*)

Juvenile silver perch (*Bidyanus bidyanus*)



Major differences from tilapia include:

1. longer, skinnier body shape
2. dent separating front of dorsal fin from the back
3. end of dorsal fin is rounded
4. forked caudal fin.

Figure 4.11 Juvenile silver perch (*Bidyanus bidyanus*)
photo courtesy of Kris Pitman, NSW DPI

Reporting procedures

In Queensland, members of the general public are encouraged to report pest fish sightings to the DEEDI Customer Service Centre by phoning 13 25 23, emailing pestfish@deedi.qld.gov.au or filling out the pest fish reporting form online at www.fisheries.qld.gov.au (search for 'report a pest fish sighting'). The form can also be mailed or faxed (Appendix E).

In New South Wales, members of the general public are encouraged to report pest fish sightings to the Aquatic Biosecurity and Risk Management unit of NSW DPI. Reports can be made by calling (02) 4916 3877, emailing aquatic.pests@industry.nsw.gov.au or online at www.dpi.nsw.gov.au and search for 'aquatic pest sightings'

The person reporting a pest fish will be asked to provide as much detail as possible, including information about the location (GPS coordinates, landmarks, roads, etc.), the type of waterbody, a description of the fish and, if possible, whether a photograph or frozen specimen of the fish was retained. If possible, it is useful to take good quality digital photos (with the fins extended and spread out) for identification. There should preferably be at least six photographs showing:

- entire body length
- close-up of head, side on
- close-up of head, front on
- close-up of dorsal fin
- pelvic fins
- caudal fin (tail).

DEEDI and NSW DPI take reports of pest fish incursions seriously, as early detection may allow a species to be contained or removed before it establishes in a catchment. It is important for government bodies to maintain a pest fish database, which is useful for storing incursion data, determining the spatial distribution of pest fish species, and helping prioritise investigations. The pest fish database also reveals recurring reports from infested waterways, as well as new locations for a pest fish species. Following a report of a pest fish sighting, a DEEDI pest fish biologist or NSW DPI aquatic biosecurity officer will consult the database for prior records and location information to determine the urgency of the response and the type of action required.

Pest fish reports that are found to be new and of high priority require some sort of preliminary survey to determine the presence, extent and spatial distribution of the pest fish in the waterbody. If performed in a timely manner, surveying and gathering data on noxious fish distribution may allow for the removal or containment of a species if it is limited to small areas.



Figure 4.12 Mozambique tilapia sighted in Bullyard Creek, Queensland



Learning activities

Identifying tilapia

Purpose: To ensure participants can confidently identify Mozambique tilapia and distinguish them from native fish species.

Trainers: Using the last slide on the PowerPoint, ask the participants to pick out the photographs of Mozambique tilapia. Show them the answer and discuss the major differences between the photographs.

Reporting tilapia

Purpose: To stress the importance of providing as much information as possible when reporting a pest fish.

Trainers: The following handouts are examples of pest fish reports that have been submitted by members of the public. Give the participants time to sort the 'good' reports out from the 'bad' ones. Go through each report with the participants and discuss with them why they considered them to be good or bad. For each report, discuss what additional information would have been useful and why.

PEST FISH REPORT 1

(via letter)

My brother and I caught this fish in a puddle left over from the rainy season. We believe it to be tilapia and have frozen the fish as instructed. The puddle was located at the base of our property.

From Shaun Sheep

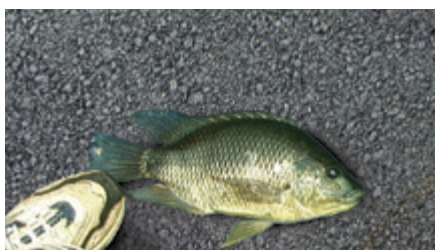


PEST FISH REPORT 2

(via email)

Attached is a photo of a suspected tilapia I found in a stormwater culvert along the Gateway Motorway 400 m south of Meadowlands Road overpass. Feel free to contact me should you wish to discuss.

Regards, P. Fish



PEST FISH REPORT 3

(via email)

Dear Fisheries

Is this a pest fish?

From Anonymous



PEST FISH REPORT 4*(via online reporting form)*

What is the fish suspected to be:	Tilapia
Is a specimen available: (Can they get a specimen and put in freezer?)	Yes (2)
Size:	About 25–35 cm in length
Shape:	Deep bream-like shape
Colour:	Olive on top – four indistinct darkish bands – the anal fin does extend almost onto the tail itself and same with the dorsal fin. The first part of the dorsal fin is equal to the top of the gill flap. Fairly long pectoral fins
Location of sighting?:	In one of the sediment ponds located at the Gateway upgrade project – just north of Murarrie in a land fill – near the Murarrie inlet

PEST FISH REPORT 5*(via online reporting form)*

What is the fish suspected to be:	Tilapia
Is a specimen available: (Can they get a specimen and put in freezer?)	No...I thought it was illegal to keep tilapia
Size:	very large
Shape:	the shape of a tilapia
Colour:	grey/silver like a tilapia
Unusual markings:	none
Location of sighting?:	in a ditch along the Pacific Highway
Is it on a private property?:	no
Landmarks, roads etc. to help with the site inspection:	there was a broken-down truck 5 m up the highway
Approx. depth of waterbody:	too deep to walk in
Approx. width of waterbody:	I could probably just jump it
Approx. length of waterbody:	as far up the highway as I could see. I think it runs under the highway too
Are there any barriers up or downstream:	Apart from the highway...I couldn't tell





Quiz

1. Tilapia are most regularly found to inhabit:
 - a) Well-vegetated areas and slow-flowing rivers and streams or still-water habitats
 - b) Well-vegetated areas and fast-flowing river rapids
 - c) Areas with little or no vegetation
 - d) Pristine water habitats with an abundance of native fish fauna
2. Circle the correct statement about tilapia nests.
 - a) Male tilapia build large circular pits or nests that are generally singular, rather than in large clusters in coarse gravel substrate
 - b) Female tilapia build singular, circular nests in soft sandy substrate to lay their eggs in
 - c) Male tilapia build large circular nests that are usually found in clusters in soft sandy or muddy substrate
 - d) Tilapia do not build their own nests, but use those abandoned by native fish such as eel-tailed catfish
3. What is a quick and easy way that usually distinguishes a pest fish from a native fish?
 - a) Pest fish usually have red eyes, while native fish have white eyes
 - b) Pest fish usually lack pelvic fins, while native fish always have pelvic fins
 - c) Pest fish often have two pairs of barbels (whiskers) at the corner of their mouths while native fish do not
 - d) Pest fish usually have a continuous dorsal fin, while native fish have a dent or gap separating the front of the dorsal fin from the rear
4. Which of the following statements is false?
 - a) Mozambique tilapia are generally a deep-bodied fish and can grow up to 40 cm long
 - b) Mozambique tilapia have a caudal fin that is slightly forked
 - c) Mozambique tilapia have a dorsal fin and anal fins that are almost symmetrical
 - d) Juvenile Mozambique tilapia usually have a small black spot at the rear of the base of the dorsal fin
5. Which of the following is a major distinguishing feature between Mozambique tilapia and barred/banded grunter?
 - a) Barred/banded grunters have vertical stripes down their sides while Mozambique tilapia do not
 - b) Mozambique tilapia have a forked caudal fin while barred/banded grunters do not
 - c) Barred/banded grunters have a dorsal fin that ends as a rounded edge while Mozambique tilapia have a dorsal fin that ends with an extended point
 - d) Mozambique tilapia always have red tips on their fins while barred/banded grunters do not

Quiz

1. a) Well-vegetated areas and slow-flowing rivers and streams or still-water habitats
2. c) Male tilapia build large circular nests that are usually found in clusters in soft sandy or muddy substrate
3. d) Pest fish usually have a continuous dorsal fin, while native fish have a dent or gap separating the front of the dorsal fin from the rear
4. b) Mozambique tilapia have a caudal fin that is slightly forked
5. c) Barred/banded grunters have a dorsal fin that ends as a rounded edge while Mozambique tilapia have a dorsal fin that ends with an extended point

FAQs

How can I keep a frozen sample of the fish I think is a tilapia if it is illegal in Queensland to be in possession of a noxious fish?

You are permitted to temporarily possess the frozen specimen for collection by a fisheries officer for identification and reporting purposes (Fisheries Queensland must be notified as soon as possible in this case).

Why doesn't the government just eradicate every pest fish population that is reported?

Eradication of pest fish species using currently available technology is rarely possible once breeding populations have become established. Therefore, priority is given to preventing further spread. Public reports of pest fish allow the spread of pest fish to be quickly identified. If a report is associated with a new incursion (in a waterway that has not previously been reported as containing pest fish), the case will be thoroughly investigated to determine the nature of the infestation and the appropriate response action (i.e. eradication or control/management).

What do I do if I already have tilapia in my farm dam?

Phone the DEEDI Customer Service Centre on 13 25 23 or NSW DPI on (02) 4916 3877 and speak to a pest fish officer who will provide appropriate recommendations and may organise an inspection of the waterbody if necessary.

There are already large populations of carp in my local area. Will tilapia still be a problem if they are introduced as well?

Yes, tilapia and carp fill different niches, meaning they have different roles and effects in the aquatic community. Therefore, the combined impact of both of these pest species will be greater than the impact of one of the species alone.

What should I do if I spot tilapia nests?

If you are sure that they are not structures made by other animals (i.e. eel-tailed catfish nests), you should report this sighting to DEEDI or NSW DPI. It would be useful if you took clear photographs of the nests and remembered to take note of the exact location and type of waterbody, etc.

What should I do if I spot someone trying to sell tilapia (alive or dead) in Queensland or live tilapia in New South Wales?

You are not encouraged to approach the seller about the legal ramifications of their actions. Instead, you should report this sort of activity immediately:

In Queensland contact DEEDI:
Telephone: 13 25 23,
Email: pestfish@deedi.qld.gov.au
Web: www.fisheries.qld.gov.au and search for 'report a pest fish sighting'.

In New South Wales, contact your local fisheries office or the Aquatic Biosecurity and Risk Management Unit of NSW DPI:
Telephone: (02) 4916 3877
Email: aquatic.pests@industry.nsw.gov.au
Web: www.dpi.nsw.gov.au and search for 'aquatic pest sightings'.

Do people eat tilapia?

Tilapia is a popular food fish in Asia, Africa and the South Pacific. However, the use of tilapia for consumption in Queensland is illegal.

Can recreational anglers target tilapia?

Tilapia may be captured during recreational fishing; however, their possession in Queensland is illegal. Therefore, any tilapia captured must be euthanised and disposed of straightaway. The most humane way of euthanising is to stun the fish with a sharp blow to the head just above the eyes, causing brain destruction. It can be disposed of in an appropriate rubbish bin or buried well away from the water. The most important things for recreational anglers to remember are not to use tilapia as bait, alive or dead, and not to release tilapia back into a waterway.

