



# Stop the spread

Tilapia training package



*Front cover images*

*All fish photographs courtesy of Gunther Schmida*

*All other cover photographs courtesy of DEEDI*



# Stop the spread

Tilapia training package





# Contents

<b>Purpose of this package</b>	<b>1</b>
Intended participants	1
<b>How to use this package</b>	<b>2</b>
Pest fish terminology	3
List of abbreviations	3
Enquiries and feedback	4
<b>Module 1: Introducing tilapia</b>	<b>6</b>
What makes an animal a pest?	7
What is a pest fish?	7
Things to know about tilapia	9
How pest fish spread	13
Case studies	14
Learning activities	15
Quiz	22
FAQs	23
<b>Module 2: Overview and history of pest fish management</b>	<b>24</b>
A history lesson in pest fish management	25
Pest fish management and the broader river health and rehabilitation	28
Limitations to pest fish control	31
Importance of raising awareness	31
Case studies	32
Learning activities	34
Quiz	35
FAQs	36
<b>Module 3: Deciphering legal jargon</b>	<b>38</b>
<b>Part A</b> (for Queensland participants)	<b>39</b>
Introduction	39
Queensland legislation	39
Federal legislation	41
Learning activities	42
FAQs	44
<b>Part B</b> (for New South Wales participants)	<b>45</b>
Introduction	45
New South Wales legislation	45
Federal legislation	47
Learning activities	48
FAQs	49
<b>Module 4: How to identify tilapia</b>	<b>50</b>
Tilapia are commonly confused with...	53
Reporting procedures	54
Learning activities	55
Quiz	57
FAQs	58

<b>Module 5: Rapid response and survey techniques</b>	<b>60</b>
What are surveys used for?	61
Survey methods	62
Survey design	66
Case studies	69
Learning activities	70
Quiz	71
FAQs	72
<b>Module 6: How to eradicate or control tilapia</b>	<b>74</b>
Introduction	75
Eradication of pest fish	75
Control of pest fish	77
Collecting, destroying and disposing of pest fish	82
Case studies	83
Learning activities	87
Quiz	88
FAQs	89
<b>Module 7: Community education</b>	<b>90</b>
Importance of community education	91
Methods of community education	91
Case studies	93
Learning activities	94
<b>Glossary of terms</b>	<b>96</b>
<b>Further reading</b>	<b>100</b>
<b>Appendix A</b>	<b>104</b>
Fisheries Regulation 2008 (Qld) Schedule 6—Glossary of scientific names for particular fish other than regulated coral reef fin fish	
<b>Appendix B</b>	<b>110</b>
<i>Fisheries Management Act 1994</i> (NSW)—Schedule 6C Noxious fish and noxious marine vegetation	
<b>Appendix C</b>	<b>114</b>
<i>Fisheries Management Act 1994</i> (NSW)—Ministerial Order Pursuant to Section 214A	
<b>Appendix D</b>	<b>116</b>
AQIS list of permitted live freshwater fish suitable for import	
<b>Appendix E</b>	<b>122</b>
Queensland pest fish reporting form (public/other agencies)	
<b>Appendix F</b>	<b>124</b>
Australian Code of Electrofishing Practice	
<b>Appendix G</b>	<b>138</b>
Rotenone material safety data sheet	





# Purpose of this package

**Stop the spread** is a training package designed to provide community members with the tools needed to help prevent tilapia incursion into the Murray–Darling Basin (MDB) and to increase their capacity to educate others about the issues surrounding pest fish. This package can be used in the general community (e.g. with school groups or recreational fishers) to raise awareness and provide the tools needed to help identify and report pest fish. It could also be used with a technical audience (e.g. councils or natural resource management groups) to provide information on available management options and how these can be incorporated into pre-existing pest management programs.

The need to increase the capacity of the wider community to tackle the problem of pest fish in Queensland and New South Wales comes from the realisation that control of pest fish is a community issue. By engaging the community, effective control and success on the ground are more likely to be achieved. State and local governments and the community as a whole have a responsibility in the control of pest fish species. For a successful outcome, individuals within the community must be empowered to contribute to the solution by participating in regional and local management actions and by contributing to general public education and awareness of exotic pest fish problems and solutions. These multi-stakeholder partnerships are the best way to use and enhance the limited

resource base allocated to pest fish control. Furthermore, engaging people within the community is the best way to directly tackle problems that are affecting or threatening to affect the community.

Most tilapia (and other pest fish) infestations are believed to be caused by people, either intentionally or unintentionally, moving fish between waterways or releasing pet fish. Government bodies currently rely on aquatic surveillance programs as well as community reports of new sightings of tilapia. This allows for a possible early response before new breeding populations can be established. The aim of this training package is to provide education and improve awareness so that community members can understand the issues related to pest fish, and participate in pest fish control and management activities with minimal help from the government. This will therefore create capacity within community-based organisations to respond to pest fish incursions.

This training package was developed by Fisheries Queensland, a service of the Department of Employment, Economic Development and Innovation (DEEDI), in collaboration with Agri-Science, also a service of DEEDI, the New South Wales Department of Primary Industries (NSW DPI), the Murray–Darling Basin Authority (MDBA) and Seqwater.

## Intended participants

This package targets the following major groups for primary training:

- natural resources management (NRM) groups
- local councils and council pest officers
- Queensland Government staff (including the Queensland Boating and Fisheries Patrol)
- New South Wales Government staff
- recreational fishing peak bodies.

It is envisaged that members of these primary target groups would then use the package to train the secondary target audience, including:

- fish stocking groups
- NRM group members
- mining groups
- aquaculture groups
- Indigenous groups
- recreational fishing group members
- ethnic communities active in the area
- schools (Years 7–12)
- other government agencies in the area.

# How to use this package

The objectives of this training package are to build capacity in the community for early detection and reporting of new pest fish incursions and to increase the ability of stakeholder organisations to aid in management activities. The training package has been designed to provide trainers with the background information and resources necessary to deliver presentations, interactive activities and take-home messages to members of the community in training workshops.

It is the role of the trainer to become familiar with the background information provided and to use this information as a reference when delivering the educational material. Trainers will use this package to gain a higher level of knowledge in the subject of pest fish, enabling them to support the community and answer many questions about pest fish in their area.

The package includes seven modules examining different aspects of pest fish. Each module contains an outline of the objectives, intended participants, key messages and learning resources. This information can be used as an aid for preparing an agenda for the workshops. In addition, the modules include:

- detailed (but easily understood) background information for trainers to become familiar with and refer to
- case studies for trainers to run through with the group and discuss
- visual aids such as diagrams, photos and other images
- PowerPoint presentations for trainers to present using their knowledge from the text
- suggested activities for interactive learning
- technical notes providing additional detail for technical users
- frequently asked questions (FAQs) as background preparation for trainers
- additional resources such as articles, web links, communication materials (posters, fact sheets, etc.), publications, handouts and field guides.

The modules are intended as guides for trainers, who will need to design their training workshops based on their audience and the time available. For example, some of the suggested learning activities may not be appropriate for all audiences and could be left out.

Some of the modules may not be relevant to all target groups. The table below suggests the most appropriate modules to use which each target group.

GROUP	MODULES						
	1	2	3	4	5	6	7
Fish stocking groups	♦	♦	♦	♦	♦		♦
NRM groups	♦	♦	♦	♦	♦	♦	♦
Mining groups	♦	♦	♦	♦	♦		♦
Aquaculture groups	♦	♦	♦	♦			♦
Indigenous groups	♦	♦	♦	♦			♦
Recreational fishing groups	♦	♦	♦	♦			♦
Ethnic communities	♦	♦	♦	♦			♦
Schools (Years 7–12)	♦	♦	♦	♦			♦
Government agencies	♦	♦	♦	♦	♦	♦	♦
Groups wanting a quick run-through of key messages	♦			♦			

If time is a constraint, trainers may wish to run a quick presentation aimed at providing only a broad introduction to the problem of tilapia. In this case, it is recommended they cover the information in Modules 1 and 4 and perhaps skip the case studies and learning activities provided.

Trainers may also wish to hold in-field training sessions for those wishing to carry out some of the survey or control techniques mentioned in the modules. For information about providing field training for some of the more specialised methods (e.g. eradication methods), please contact DEEDI on 13 25 23 or email [pestfish@deedi.qld.gov.au](mailto:pestfish@deedi.qld.gov.au).

This training package is intended to be highly flexible and can be adapted to cater to the needs of a variety of audiences.





## Pest fish terminology

This training package uses the term ‘pest fish’ to refer to fish species that are not native to an area and have potential negative impacts. In other contexts, you may come across other terms that essentially mean the same thing, such as:

- feral fish
- non-native fish
- alien fish
- introduced fish
- exotic fish
- invasive fish
- foreign fish.

The terms ‘noxious fish’ and ‘nonindigenous fish’ are also used throughout this training package. Both can be pest fish. These terms are primarily used for legislative purposes, where ‘noxious’ means a fish genus or species that has been declared as noxious by the *Fisheries Act 1994* in Queensland or the *Fisheries Management Act 1994* in New South Wales. The term ‘non-indigenous fish’ refers to a species that is found to exist in a local area where it would not naturally occur, whether the species is native to Australia or not.

## List of abbreviations

AEC	Animal ethics committee
ai	Active ingredient
APVMA	Australian Pesticides and Veterinary Medicines Authority
AQIS	Australian Quarantine and Inspection Service
CMA	Catchment management authority
DAFF	Department of Agriculture, Fisheries and Forestry (Federal)
DEEDI	Department of Employment, Economic Development and Innovation (Queensland)
DEWHA	Department of the Environment, Water, Heritage and the Arts (Federal)
DPI&F	Department of Primary Industries and Fisheries (former Queensland department)
FAQ	Frequently asked question
GPS	Global positioning system
ICC	Ipswich City Council
MDB	Murray–Darling Basin
MDBA	Murray–Darling Basin Authority
MDBC	Murray–Darling Basin Commission (replaced by MDBA)
MER	Monitoring, evaluation and reporting
MSDS	Material safety data sheet
NRM	Natural resource management
NSW	New South Wales
NSW DPI	New South Wales Department of Primary Industries
OFMIG	Ornamental Fish Management Implementation Group (National)
Qld	Queensland
SEQ	South East Queensland



## Enquiries and feedback

We welcome enquiries relating to this training package and its delivery, and requests for additional resources. Feedback from users would be appreciated and will be used to improve this training package and other similar products.

Please forward any enquiries, suggestions or comments to:

**The Pest Fish Officer**

**Email: [pestfish@deedi.qld.gov.au](mailto:pestfish@deedi.qld.gov.au)**

**Tel: 13 25 23**

