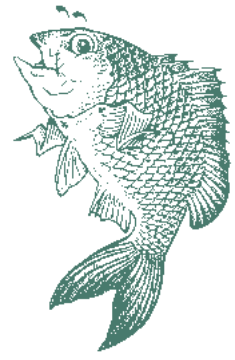


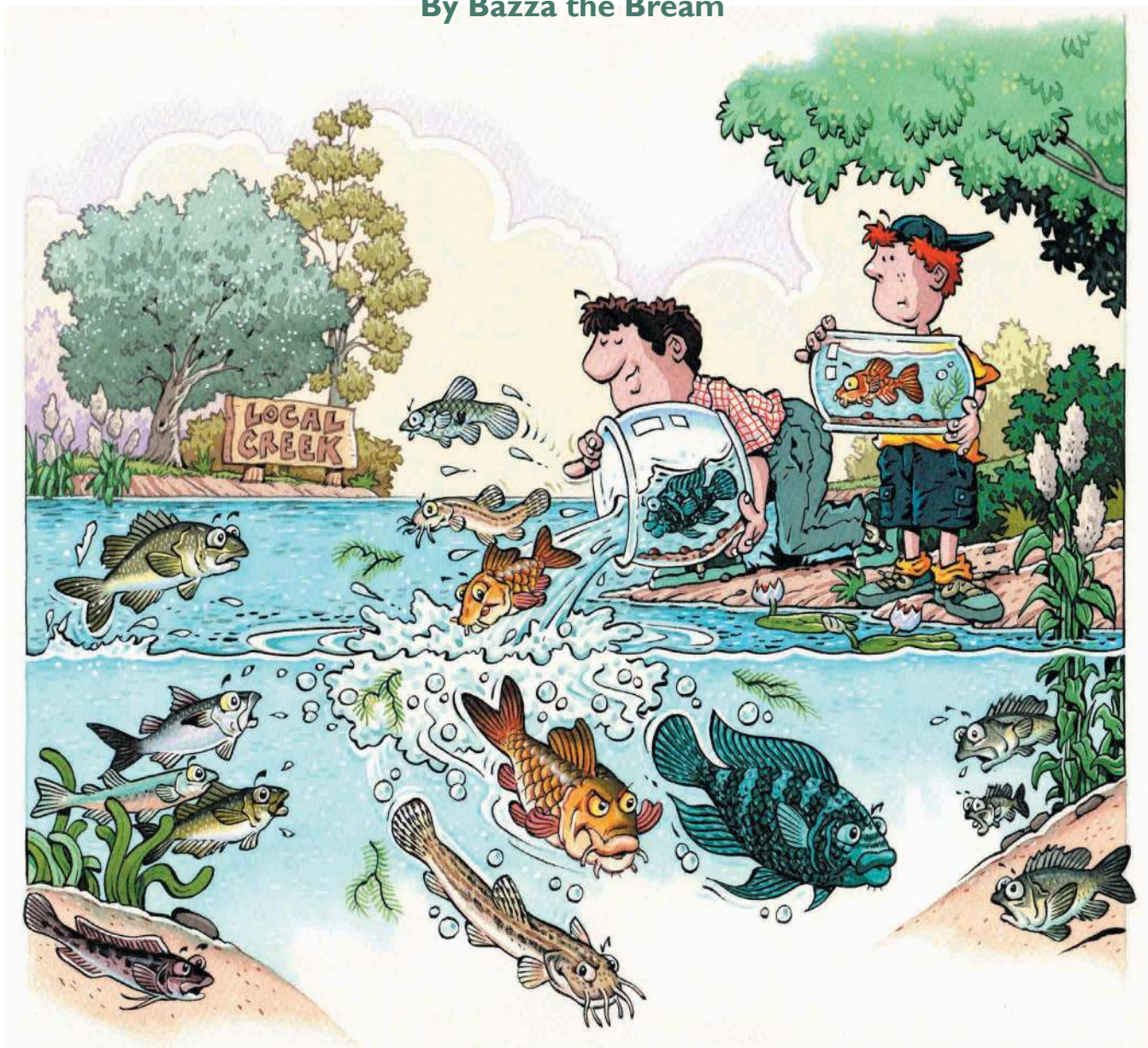
Alert! Alert!



Help to stop the spread of Aquatic Exotic Pests in East Gippsland

A primary school student resource to raise awareness of the exotic pest species that have invaded and have the potential to invade our aquatic waterways in East Gippsland and how you can help!

By Bazza the Bream



Purpose of this book

This resource book was created to raise awareness of the aquatic exotic pest species that have invaded or have the potential to invade waterways in East Gippsland. Fishcare East Gippsland Inc. is a non for profit organisation that promotes responsible fishing practices and care for aquatic environments. Fishcare East Gippsland Inc. deliver educational fishing workshops for children throughout the East and the Far East Gippsland Region. This resource will be implemented into the primary and secondary school's Fishcare educational fishing program.

Terms used throughout this booklet

Blue-green algae

toxic algae that can cause fish kills.

Brackish

salt water and fresh water mixed together.

Common names

the name that everyone uses.

Example: Common name - European Carp.

Competition

when everyone is competing for the same resource, food and shelter.

Ecology

relationships between animals and plants and their environments.

Eradicate

to get rid of.

Estuary

a partly enclosed body of water along the coast, where freshwater from rivers meet and mixes with salt water from the ocean.

Exotic

species brought here either accidentally or deliberately into places where they have not existed before.

Habitat

The species natural environment.

Larvae

baby fish that have just hatched from their eggs. When hatched, their egg sack is still attached which provides them with their food nutrition.

Fry

baby fish whose egg sack has completely disappeared and they now have to find food in order to survive.

Fingerlings

when the fry have developed scales and working fins, and are about the size of your finger.

Indigenous

native animals which live in our region.

Native

animals and plants that belong in Australia.

Noxious

an exotic pest species that is harmful and declared as "Noxious" under law. Special rules apply to catching and releasing a fish that has been called "Noxious". Noxious fish cannot be kept alive or released back into the water.

Pest

a species that causes significant environment, social and economic harm.

Predation

where a predator feeds on their prey.

Scientific names

the name that scientists use to identify the species and mostly use the "Latin" language.

Example: Scientific name - *Cyprinus carpio*. *Cyprinus* is Greek, and *carpio* is Latin; both words mean "carp".

Weirs

man-made obstacles set across a waterway for water storage.

About the Author

Bazza the Bream

Bazza is a mature Black Bream who was born and raised in the Gippsland Lakes. He is around 45 cm long and thirty years old.

Bazza is an experienced traveller around the Gippsland Lakes system and swims up the adjoining rivers in the winter months. He has experienced the first-hand impacts of European Carp and hates them with a passion. Bazza has hated the invasion of European Carp as they wrecked his home, occur in large numbers and make the once clear water of the rivers, dirty and smelly.

These days Bazza prefers to travel up the Tambo River in the winter months because it has cleaner water and a healthier environment.

Bazza has also experienced the changes in water quality. He has seen several large blue- green algae blooms that have resulted in the loss of seagrass beds, which are important nurseries for baby bream.

The invasion of European Carp in this region has prompted Bazza to write this book to educate the school children in East Gippsland and Far East Gippsland about our aquatic exotic pest species and identify any potential new aquatic exotic pest species and how people can help to control this big problem.

Bazza would like to acknowledge all his valuable friends that have helped put together the following information to educate the next generation of children. Lets hope, it will help with the exotic pest problem in our precious waterways in East Gippsland.



Contents

Introduction	5
Chapter 1 Meet the Locals	6
Introducing my Native Freshwater Friends	7
Stream to Ocean Maze	7
Introducing our Native Estuary Friends	
Introducing Myself! Bazza the Black Bream	10
Introducing our Native Marine Saltwater Friends	11
Bazzas's Crossword	12
Chapter 2 Coping with Change	13
The People Invasion	13
Colour in the Pictures	15
The Exotic Pest Invasion	15
Chapter 3 The Exotic Pest Species	16
What are Exotic Pests and why are they so bad for the Locals?	16
Existing Exotic Pest Fish	17
Pick the Pest	20
Alert! Alert! Potential Exotic Pest Fish	20
Fish Word Search	23
Chapter 4 How did the different Exotic Pests get here??	23
The Carp Invasion	23
Better Fishing	23
The Unwanted Aquarium Fish	24
Aquarium Escapee Story	24
Controlling Other Pests	25
Bait Release	26
Native Fish versus Native Fish	26
Hitchhiked Here from Other Places	27
Hitchhiked on Boats and Equipment	28
Find the Pest	28
Chapter 5 How you can help?	28
You can make a big difference!	29
Get your Parents Involved!	31
Additional Information	34



Introduction

A very long time ago, our big home, Australia separated from other land masses and became an isolated island.

Native fish were abundant and there were many different types of native fish living in and sharing our streams, rivers and estuaries with other native aquatic animals such as water rats and platypus.

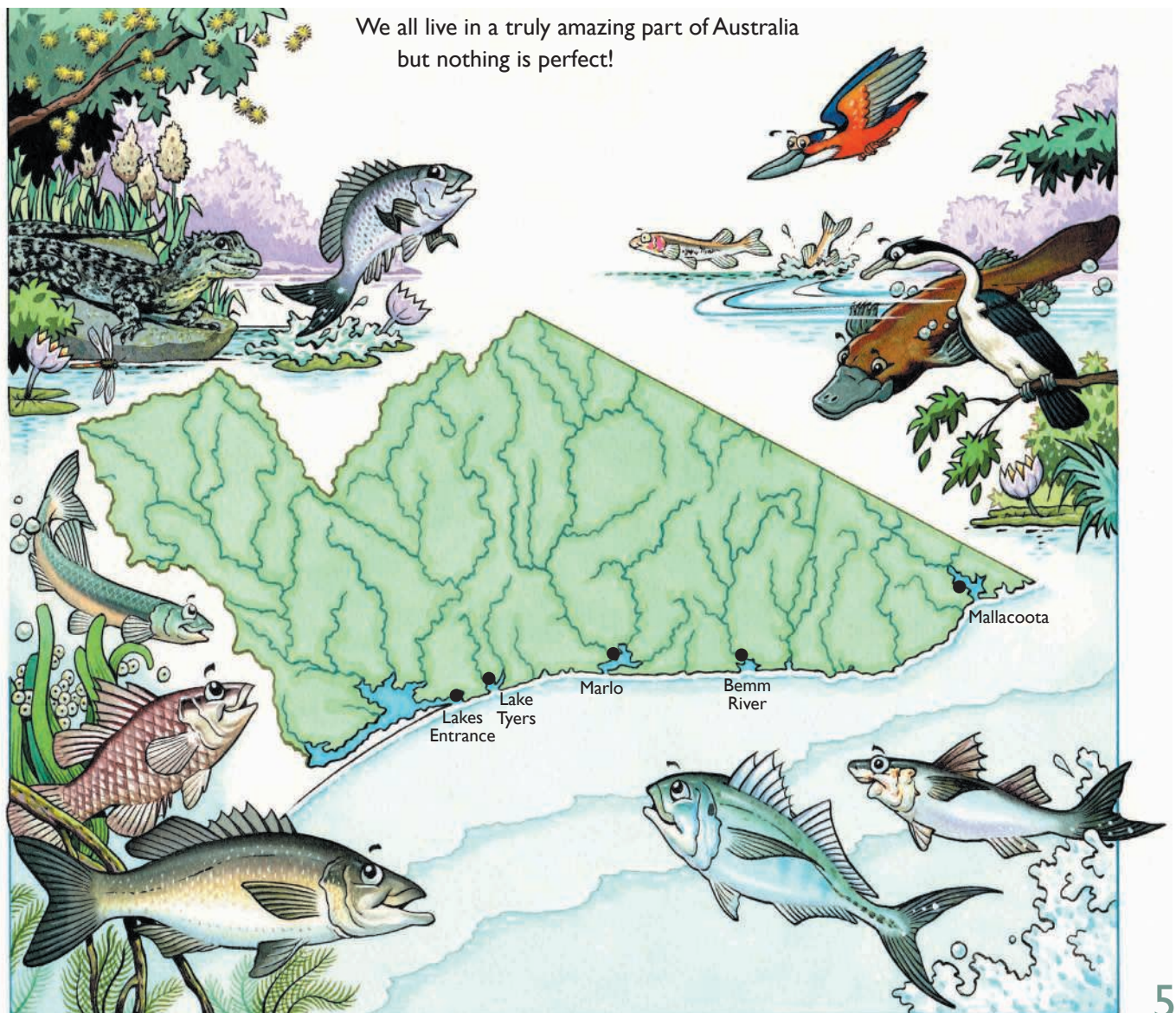
Firstly, you need to understand that “native” means animals that belong in Australia and we will refer to another word “indigenous” in this booklet, which means the native animals which live within our region.

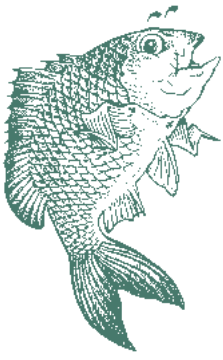
Our home is in the East Gippsland water systems, where the mountain streams flow down into the rivers. These rivers empty into the estuaries, and then this big body of water empties through an entrance into the ocean.

In some water systems, the entrance to the ocean is constantly open but some open and close depending on water levels in the bottom lakes and also the movement of the sand by the sea.

In this region, we have the Mitchell River, the Tambo River and the Nicholson River that flow into the beautiful Gippsland Lakes. Other unique water systems within this region include Lake Tyers, Snowy River, Wingam and the Bemm, Cann and Genoa systems. There are many “heritage” listed rivers such as Genoa, Bemm, Snowy and the Mitchell River that have special nature, conservation, recreation, scenic and cultural heritage values.

As you can see from the map, there are many water systems in East Gippsland for exotic pest species to live and lots of different places for potential exotic pests to hide before we would know they are here!





Chapter 1

Meet the Locals

Everyone needs to have a better understanding of who we are as there are many different kinds of indigenous fish that live in this region, some you may have never heard of before!

As you know by now, my name is Bazza and I love living in this region. I love to swim around the mighty Gippsland Lakes and also enjoy travelling up the beautiful rivers that flow into this big lake system.

From a young larvae to adulthood, I have shared the local rivers and lakes with many other different species of native fish and animals. The local native fish that I like hanging out with include the Australian Bass, and the Estuary Perch. At various times of the year, we all share the same space in the waterways.

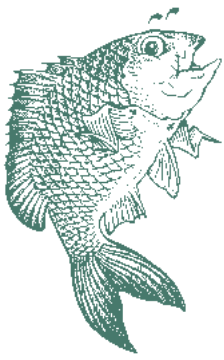
Other smaller native fish such as the Galaxias, Australian Grayling, Gudgeons, Blackfish, Pygmy Perch and Tupong love the freshwater and live in up in the rivers and freshwater streams.

At times, when we are hanging out up in the rivers, we also see our salt water friends such as Mullet, Trevally, Flathead and Salmon checking out what is happening up in these rivers, but they like to travel back into the estuaries as they prefer the saltier water.

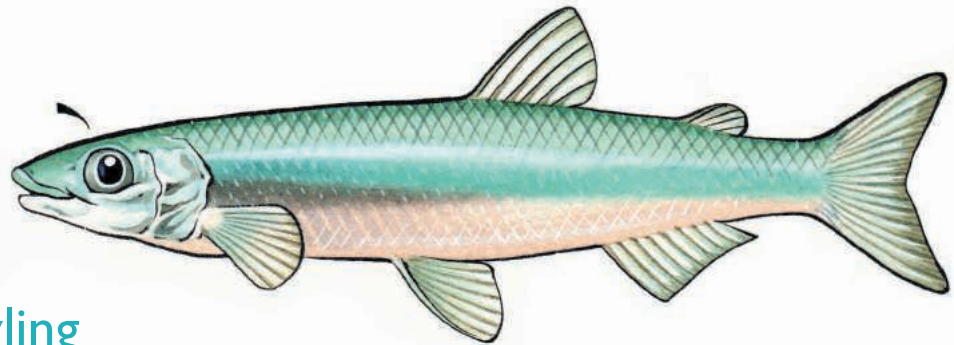
Over time, each one of us found our own special place, where there was a large amount of food, lots of shelter and we were able to breed lots of young ones and hang out like fish do!

We all had natural predators, especially when we were small, but we have all learnt effective ways of keeping out of their way!





Introducing my Native Freshwater Friends



Meet Ally, the Australian Grayling

Hello, my name is Ally and I am an Australian Grayling.

Australian Grayling are short lived, only living for a couple of years. In the autumn months, we all travel down from the streams into the big rivers where we lay our eggs. When our eggs hatch, our baby larvae are swept out to sea – very harsh indeed!

But months later, many of our young fingerlings return back into our estuaries and travel back up into the rivers.

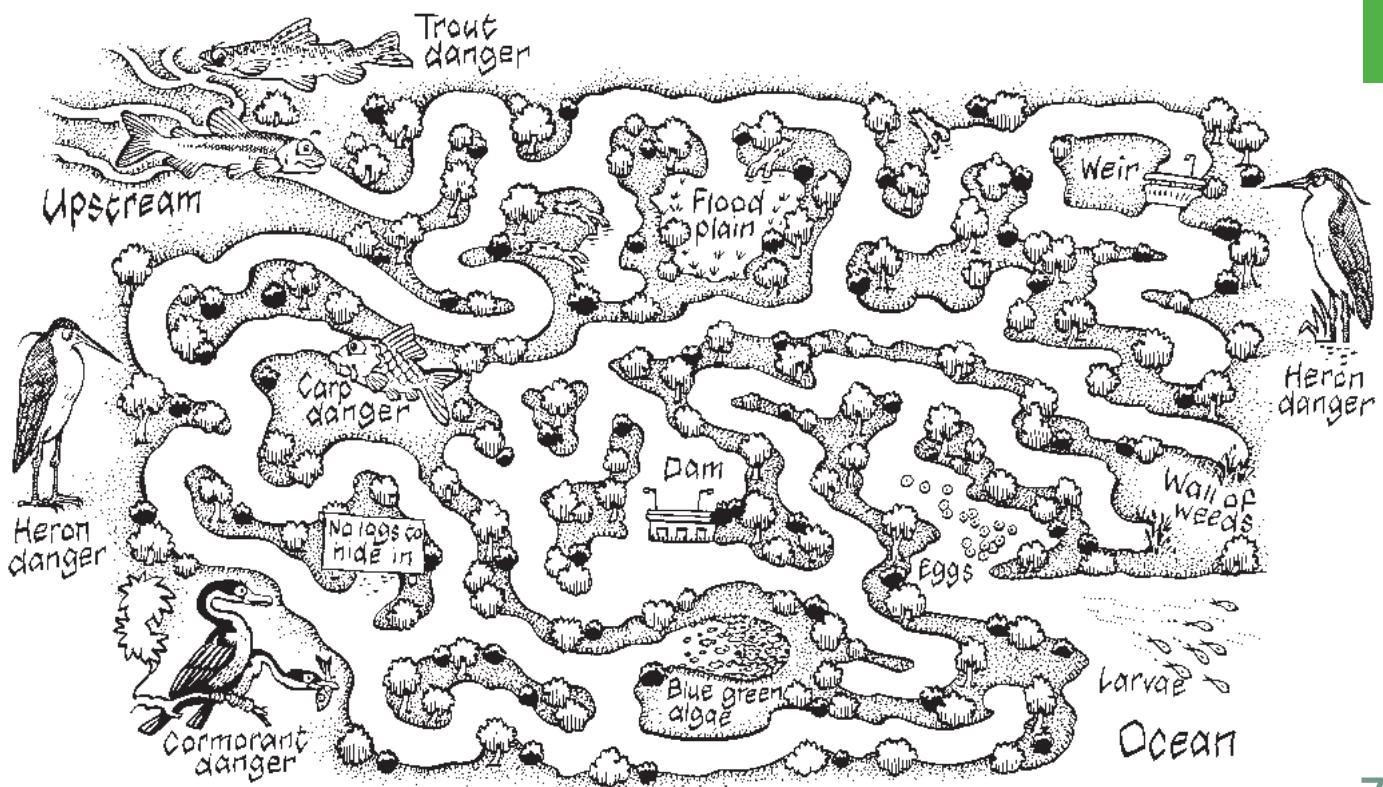
We are so pleased to see them back safely.

In the old days, our journey down and back up into the rivers to breed was easy but these days, it is a difficult journey due to the lack of places to camp and hide which makes us easy targets for other fish to hassle and prey on us.

These days there are not that many of us left and as a result, we are protected under law, so you cannot fish for us anymore.

Stream to Ocean Maze

Please help Ally find her way down the rivers and into the estuaries to lay her eggs. If she is successful, her eggs will hatch and her larvae babies can then go out into the ocean to return back into the estuaries when they are fingerlings.



activity

Hello, I am Aussie, the Australian Bass



My name is Aussie and my kind love the freshwater rivers.

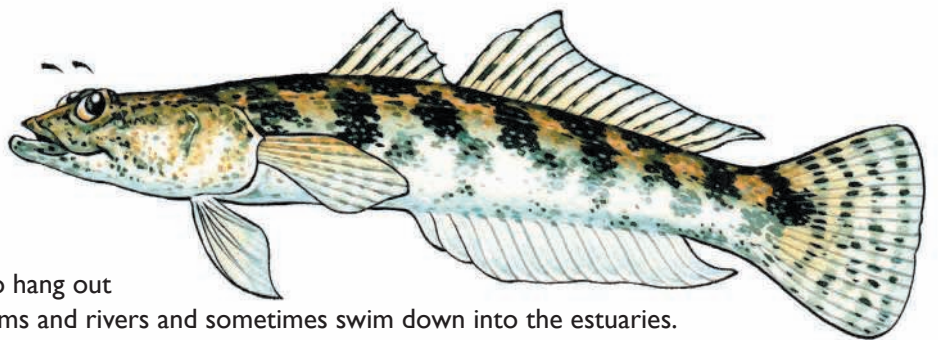
We migrate down into the saltier waters of the estuaries to breed and then our young ones travel back up into the rivers when mature. Years ago, there were so many of us in the river systems but these days our numbers have declined due to man-made barriers such as weirs that have prevented our movement up and down the rivers to breed.

Also in the old days, the early settlers removed all our log homes to allow their boats to travel safely up and down the rivers but times have changed and now people have put logs back into the water to create homes for us and to give us somewhere to hide from our predators.

People have also started to breed us and put more of us back into the rivers every year, especially in the local rivers such as the Mitchell River, and it is now great seeing more of us swimming around like old times.

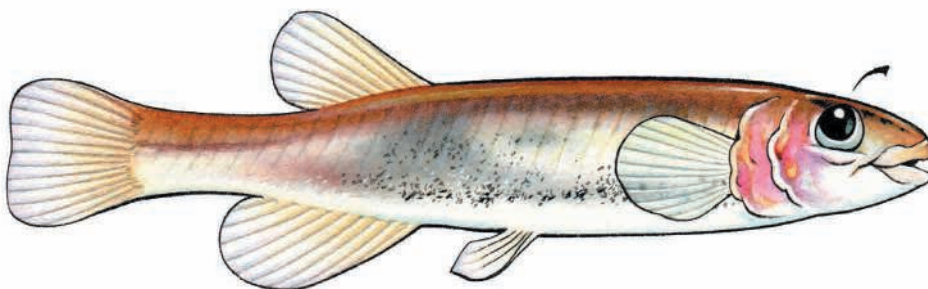
People love fishing for us as apparently we are delicious to eat, so we do need plenty of places to hide.

Hi Guys, my name is Trevor the Tupong



Our kind are common. We love to hang out at the bottom of freshwater streams and rivers and sometimes swim down into the estuaries.

We love to hide on the bottom. We have camouflaged patterns on our back which make us hard to see. We sneak up and ambush our food which makes things a little more entertaining around here. We are sometimes called the "Freshwater Flatty" as we look similar to a saltwater flathead, but because we are a smaller species, not many people fish for us, thank goodness!



Hi, my name is Gus the Galaxias

I am a Mountain Galaxias and we live in good numbers in small flowing streams up in the hills and mountains. There are many different species of Galaxias but I'm sad to say that some of my cousins have disappeared altogether and some only exist in small numbers due to the predation and competition from introduced fish species.

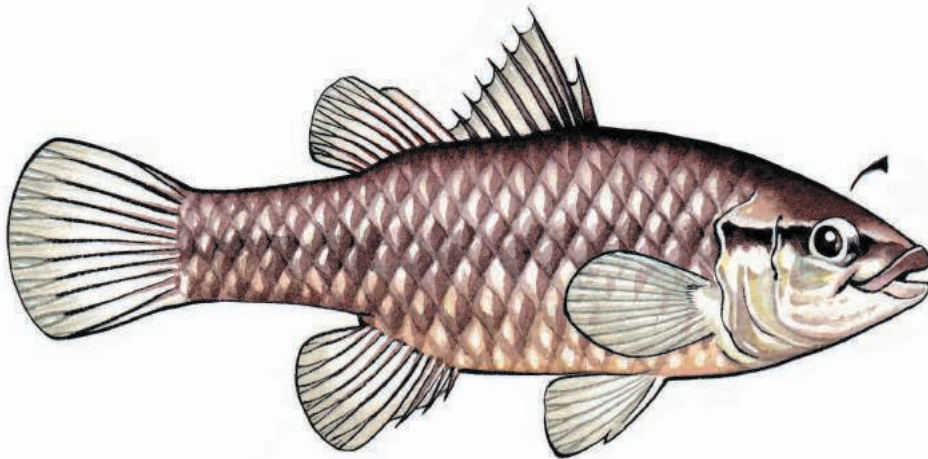
Hi, my name is Bruce the River Blackfish

We love the rivers and mainly swim around at night! We all love to hang out in dark places like undercut banks, logs and near rocks. We actually lay our eggs in hollow logs. We were once common but our numbers have declined due to the removal of our log homes and from the silt that has been washed into our rivers from local bushfires. This silt invaded our homes, therefore we have nowhere to hide from our predators. It takes a long time for our species to establish new families back in our favoured areas.

We are also delicious to eat, so we are always careful to avoid and hide from people that are fishing along the banks.

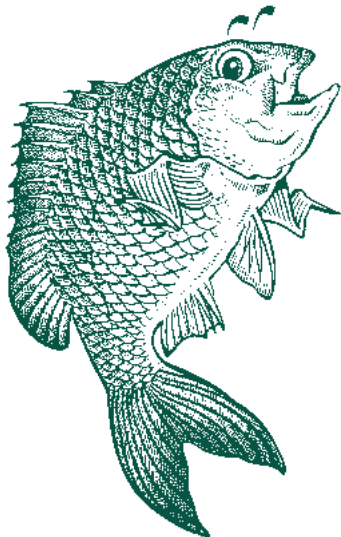


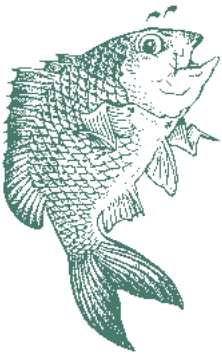
Hi, my name is Pat the Southern Pygmy Perch



We are only small sized fish and love hiding amongst aquatic vegetation in small waterways. We hang out together in groups and are common in some areas but have disappeared from others. People keep an eye on us, as we are important to the ecology of the local streams and rivers.

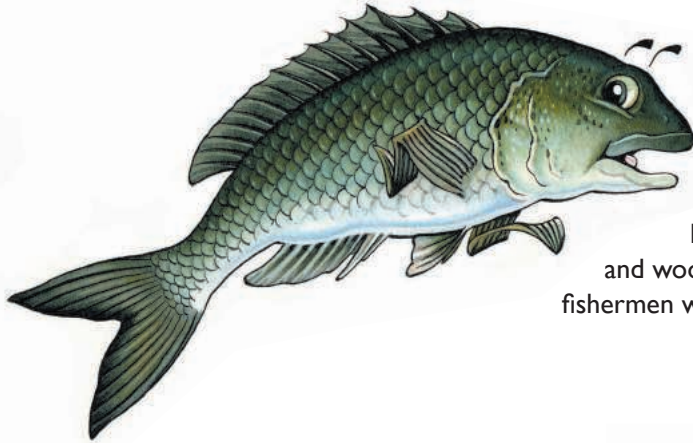
How many of
these freshwater
fish did you
already know?





Introducing our Native Estuary Friends

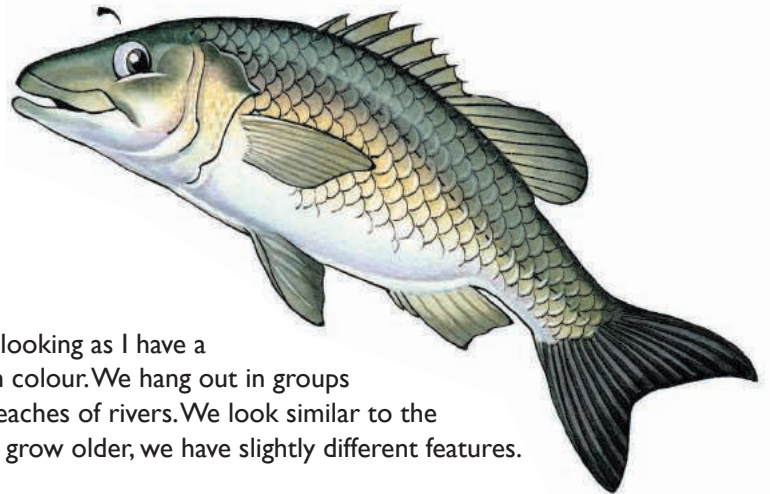
Introducing myself! Bazza the Black Bream



You already know who I am. Black Bream are a slow growing native species and can live up to forty years old.

We are known to swim out into the ocean but prefer to travel around the estuaries and go up into the lower parts of the rivers to breed in the colder months.

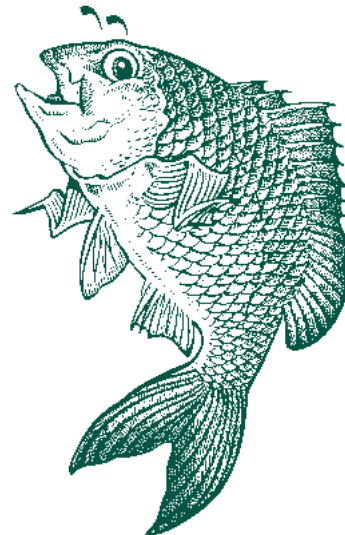
I love hanging out with my friends and hiding under jetties and woody structures for protection from predators and the fishermen who just love to fish for us!



Hello, my name is Evie, the Estuary Perch

I love being a young Estuary Perch. I am good looking as I have a scooped forehead and am greenish to silver in colour. We hang out in groups amongst logs in the estuaries and the lower reaches of rivers. We look similar to the Australian Bass when we are young but as we grow older, we have slightly different features.

Do you realise that the seahorses that live in our estuaries are also fish and are fully protected which means you cannot collect them.

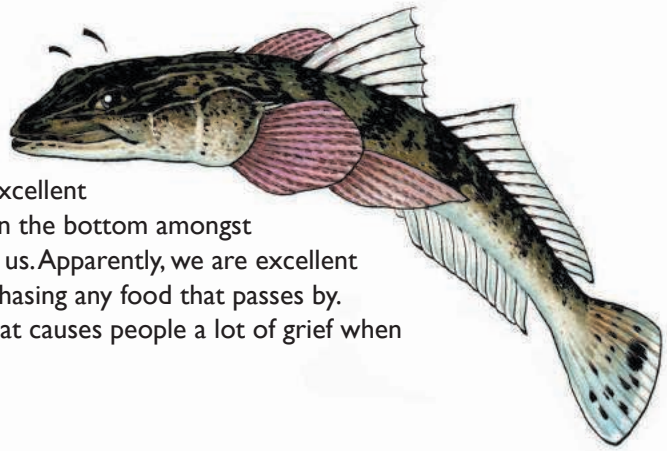




Introducing our Native Marine Saltwater Friends

Des, the Dusky Flathead

My friends call me Des!!!! We love the waters of East Gippsland as it is a perfect place for us to live. We are excellent ambush predators. We have camouflaged skin, so hide on the bottom amongst the sand and seagrass waiting for our food to pass over us. Apparently, we are excellent eating and easy to catch as we are aggressive and love chasing any food that passes by. We also have some pain inflicting spikes on our body that causes people a lot of grief when they do catch us, so watch out!

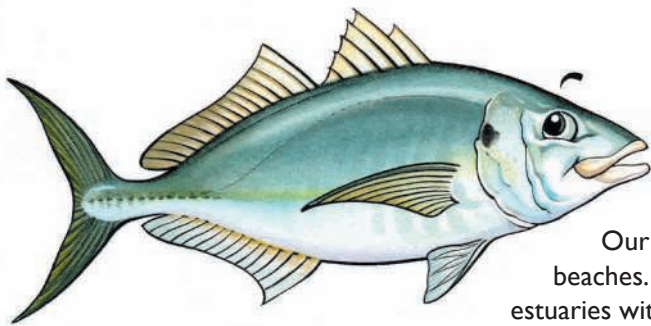


Sally, the Silver Trevally

Sally is my name and I am a pretty, flashy fish with a shimmering gold back and silvery blue underneath.

I have a black beauty spot on the edge of my gill plate.

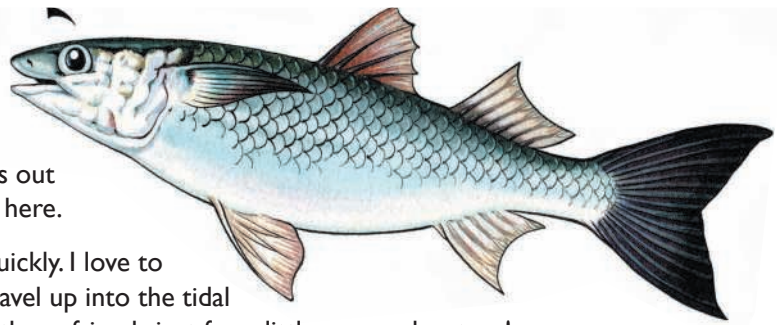
Our parents like to go out in the ocean and travel along the beaches. As I am just a youngster, I just like to hang out in the estuaries with my friends and occasionally go up to check out the tidal parts of the rivers in search of food.



Mal, the Mullet

I like being a mullet, as I have lots of friends to hang out with and we enjoy throwing ourselves out of the water just to let everyone know we are here.

I have a long body, which allows me to travel quickly. I love to hang out in sheltered waters but also like to travel up into the tidal parts of rivers and to go out into the ocean with my friends just for a little more adventure!



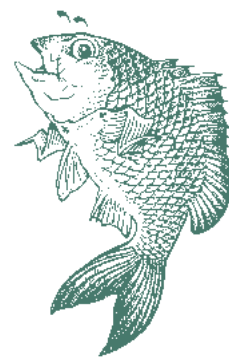
Annie, the Australian Salmon

We love to travel around the shorelines and explore different places. When youngsters, we will go up in the salty sections of the rivers and also love the open spaces of estuaries. We also get together and swim in large schools out in the ocean, where we love to swim in the shallow waters along the beaches.

This is where people love to fish for us. Many of us have escaped being caught as we are a strong and fast moving fish, and sometimes just too quick for the beach fisherman. I have lost many friends to fishing over the years, but lucky there is lots of us around.



Bazza's Crossword

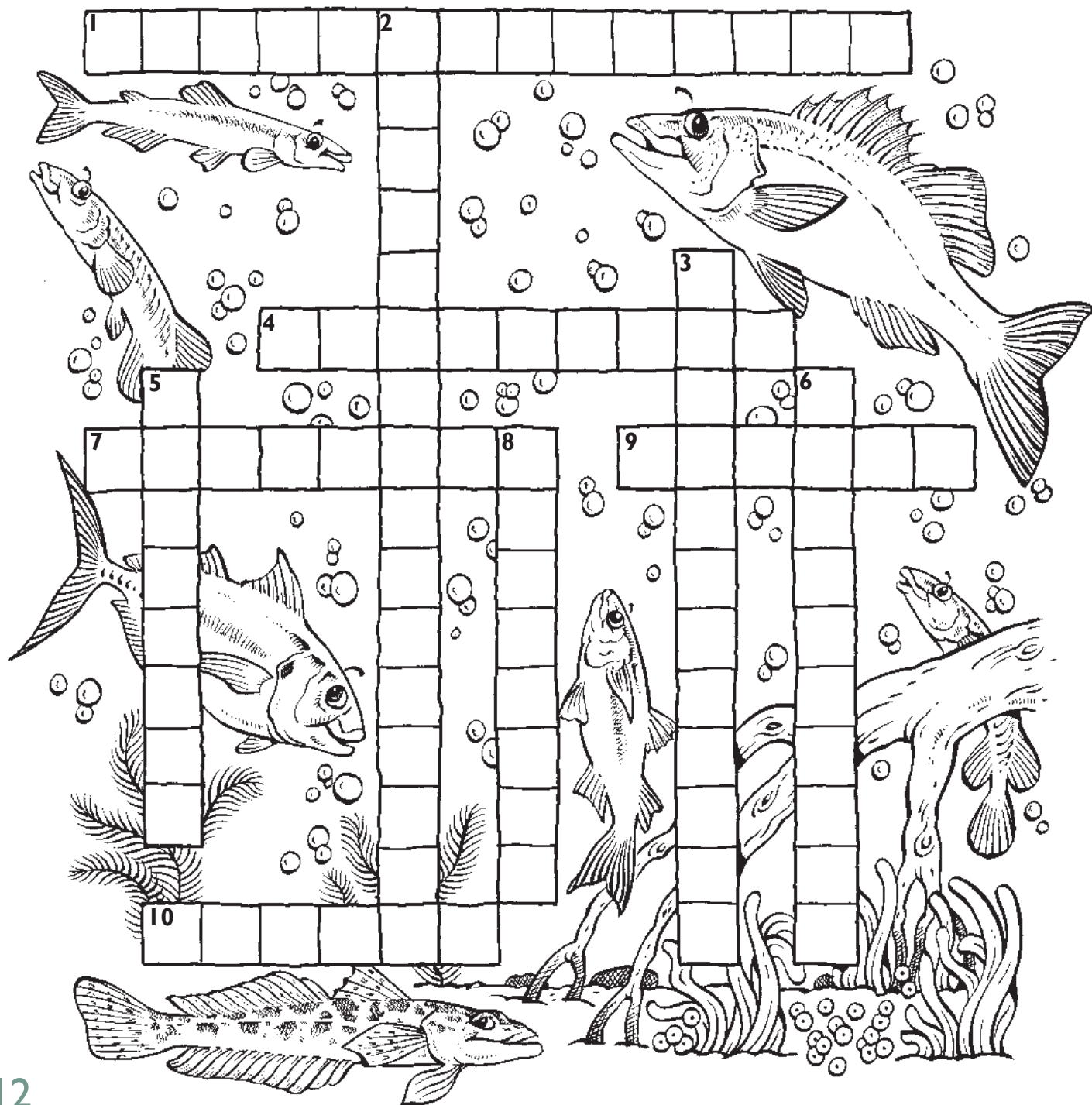


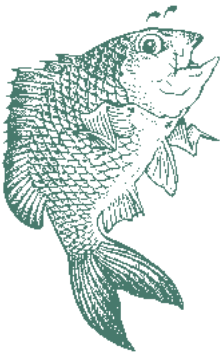
Across

1. People are breeding us and putting us back into the rivers.
4. We lay our eggs in logs.
7. Our larvae is swept out to sea but return back into the estuaries when older.
9. We like to jump out in front of people when they are fishing.
10. We are sometimes called a freshwater "Flatty".

Down

2. We are a strong fast moving fish.
3. We look like Australian Bass when young.
5. We are silvery in colour with a black spot.
6. Bazza is one of these.
8. We are a small fish that are disappearing.





Chapter 2

Coping with Change

The People Invasion

Growing up, I have seen first-hand the big changes that have occurred along our waterways. Many years ago, my grandparents watched as the first European people moved here and built towns along our rivers and lakes. These settlers cleared the trees along our river banks for their new homes and for farming. They also removed nearly all the logs and fallen trees from the rivers as their boats were their main way to travel and needed a clear passage. But this made it hard for us to find food and shelter and to hide from predators as well as the people themselves.

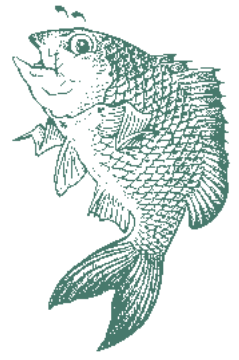
Over the years, people planted exotic trees such as willows which did not belong here and their roots are not suited as homes for us. Now people have decided to remove all the willows and plant back the native trees that used to live here, which is a great thing for us!

People love to go fishing. Sometimes people take too many fish which is greedy. Others take fish that are either too small or too large. Taking small fish has had a big impact on our numbers as these fish never had a chance to grow up and breed. The big fish are good breeders and produce lots of eggs, so by releasing the bigger fish, people can ensure there are lots of us for the future. I have been caught three times and each time I have been released back into the water! Maybe the younger generation like to see us big guys returned back into the water to breed and have many more babies for the next generation to enjoy the experience of fishing.

LET'S HOPE!



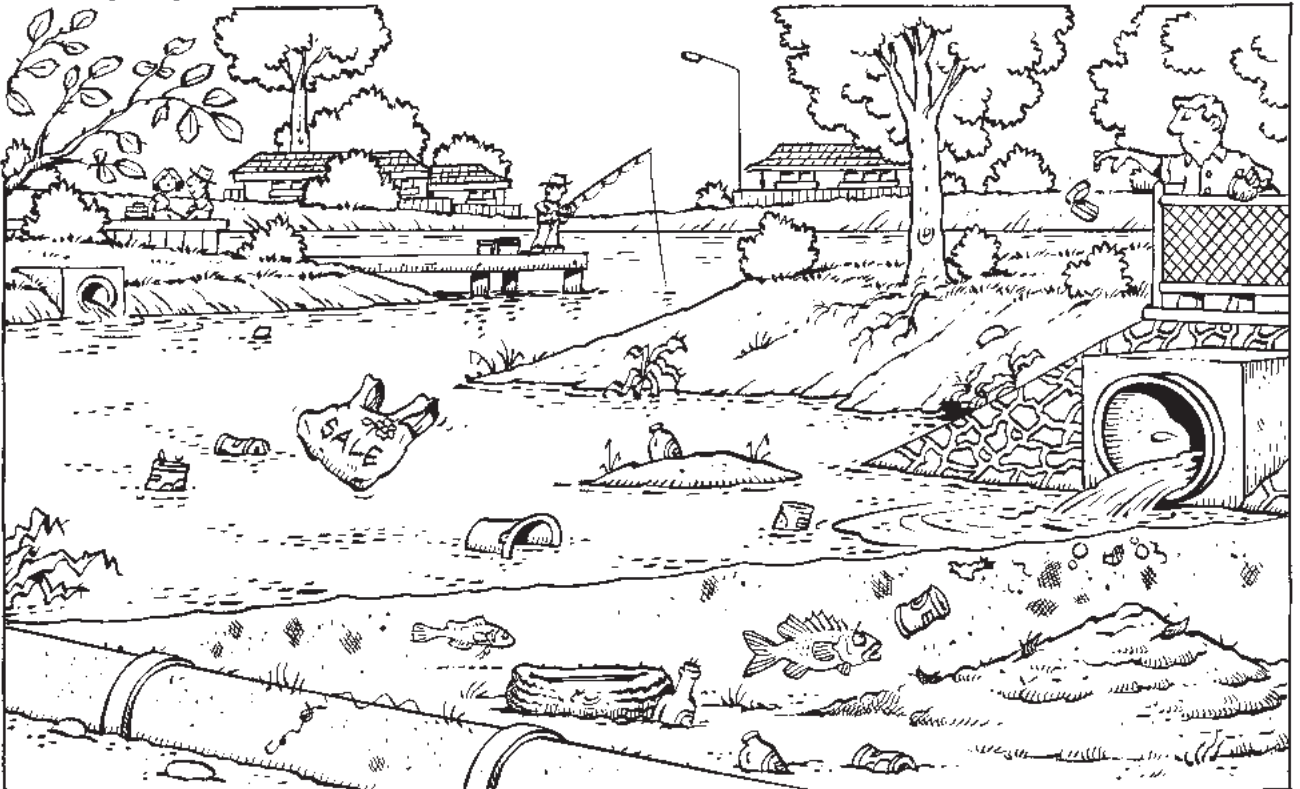
Colour in the Pictures



Before people!



After people!





The Exotic Pest Invasion

Some of my native fish friends did not cope with the many changes that came with European settlement but another invasion was still to come.

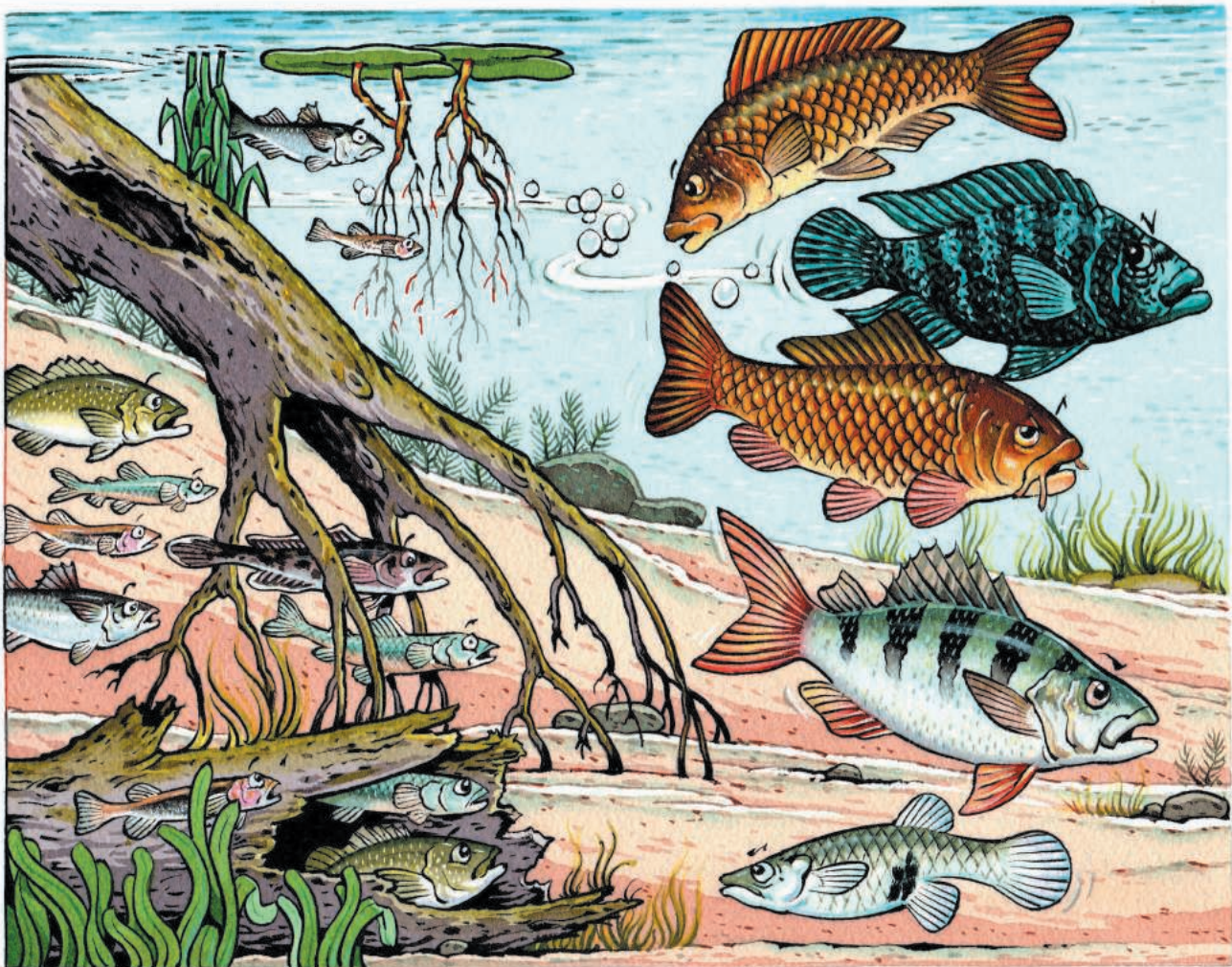
New fish that we had never seen before, began to turn up on our patch! These fish are called exotic pest fish or introduced fish. These pest fish create havoc by eating our eggs and our babies, nipping at our fins and tails and competing with us for food and shelter and generally ruining our waterways.

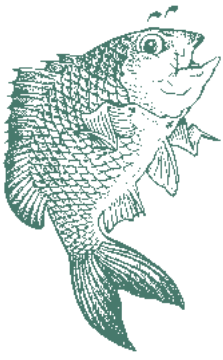
Some exotic pest fish are big, while others are small and they can even be pretty and colourful. We have no idea how to cope with these new invaders, especially those that want to eat us as we have never learnt how to run and hide from such predator fish before.

As native fish, we grow slowly and live to an old age and we do not breed until we are a couple of years old. We need lots of space to live, breed and to go about our daily routine of hunting for food and resting under logs and bank vegetation.

Since the arrival of these new exotic pest fish, our native fish populations have dropped in numbers, with a majority of our smaller native species now listed as rare, threatened and vulnerable as a direct impact of these new exotic pest fish. Some of our smaller freshwater friends, the Galaxias are almost gone forever.

Many different sorts of exotic pest species have come to our region but we have heard stories from other places, that there are other different types of exotic pest fish never seen before turning up as well!





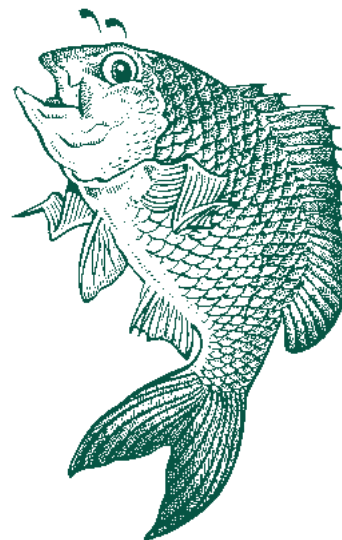
Chapter 3

The Exotic Pest Species

What are exotic pests and why are they so bad for the locals?

- These exotic pest fish are not native or indigenous to Australia as they have been brought here by humans from other places or countries.
- Many species of exotic pest fish breed from an early age and can breed several times in a year, therefore they end up taking over our territory.
- Some exotic pest fish even have live babies instead of eggs.
- Many exotic pest fish grow much quicker than we do, so there are many more of them in a short time.
- Many pest fish can survive and thrive in poor water conditions and degraded habitats.
- Many exotic pest fish are “super aggressive bullies” and chase us out from our homes or eat us.
- Some exotic pest fish will nip at our fins and tails, causing infection that can cause death.
- Some species of exotic pest fish like to eat our eggs and also our small juvenile native babies.
- Exotic pest fish compete for our food and leave little for us.
- Many exotic pest fish love to wreck and take over our homes and our shelters.
- Many exotic pest species can carry diseases and pass them to us.

Did you know that there are different rules if you catch an exotic pest fish! Read on and find out what they are!





Existing Exotic Pest Fish

European Carp

Cyprinus carpio

When these new, big fish with large scales and whiskers appeared in our waterways, we all knew things were never going to be the same. They are called European Carp but we call them “mud pests”. They cruise around in packs, and dominate our space.

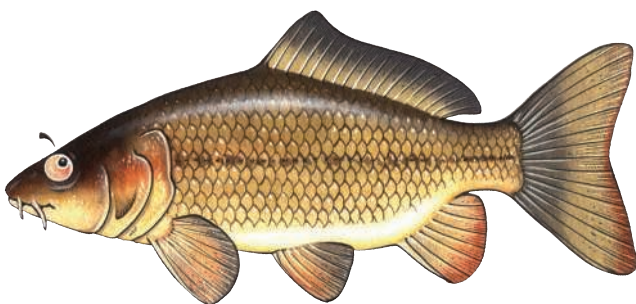
At times, there may not be many around and we can relax, but after a flood, thousands of these carp turn up and take over our rivers, our homes, eat all our food and make our river banks, muddy and dirty.

I have been informed that European Carp are here to stay. People have been trying different ways to get rid of them but nothing has been successful yet.

These days, government organisations like to look after us, “the cool native fish” and have put a special listing on European Carp and called them “noxious”. This means that you cannot keep European Carp alive or use them as live bait.

If you catch one, you are not to return it back into the water alive.

I have heard that European Carp have other varieties called Mirror Carp and Koi Carp. We have not seen these types of carp and do not want them here as European Carp are hard enough to put up with.



Eastern Gambusia

Gambusia holbrooki

Thousands of Eastern Gambusia are already living up our freshwater streams and having a major effect on our smaller, native freshwater friends by either beating them up or eating their eggs and young.

These small exotic pest fish are also called “Mosquito fish” and are very aggressive and like to nip the fins and tails of our smaller native friends, which leads to infections and sometimes death.

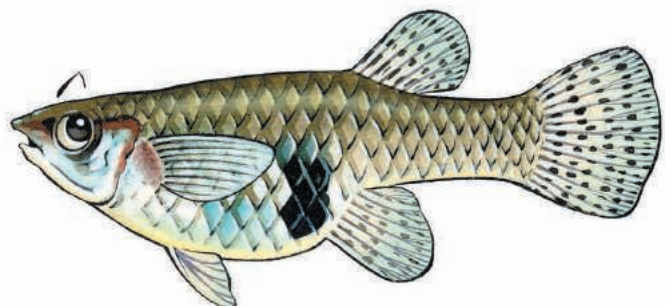
These exotic pest fish are tough and can withstand very harsh environmental conditions. They are happy in very warm water and can also survive when there is little oxygen in the water as they can gulp air from the surface instead.

These exotic pest fish do something totally different to what our local native species do, they have live babies instead of eggs.

This means they have more babies in the water quicker that eat all the available food and take over our nursery homes, which leaves nothing for our own native baby fish larvae when they hatch out of their eggs!

This competition has had severe impacts on our smaller native fish friends such as the Dwarf Galaxias, who have nearly disappeared from our freshwater streams and rivers altogether.

Eastern Gambusia have had such an impact on our smaller native friends, they have been listed as “noxious” which is the same listing as European Carp.



Goldfish

Carassius auratus

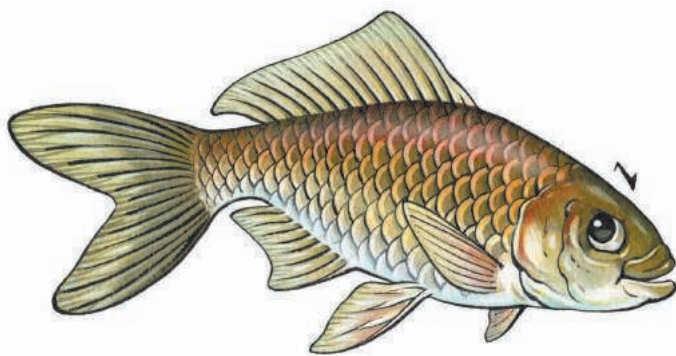
People love buying goldfish as they are colourful and easy to look after. Goldfish are the most popular fish that are bought for people's aquarium fish tanks and their outside ponds. Goldfish are close relatives of carp and I have been told a story that goldfish can cross-breed with carp, which is a big worry.

Goldfish are pretty, many are orange, but others can come in a variety of colours. Up in the different freshwater streams and rivers, my native freshwater friends now see plenty of goldfish as they are easy to spot and they love our streams compared to their small fish tanks.

They are hardy and can live in very warm water and although they prefer freshwater, they can also cope with saltier water. They can start having babies when they are only one year old and can produce several hundred thousand eggs at one time, far more than we can produce!

My native freshwater friends do not like goldfish as they eat all the food and love to take over their homes and shelter as well.

Rumours are that goldfish carry a virus that may be spread to different native fish but this is not yet proven but certainly, we do not want them to spread any virus onto our patch!



European Green Shore Crab

Carcinus maenas

We have been only talking about exotic pest fish but there are other major exotic pests that live in waterways. We have an exotic pest crab living in large numbers within the Gippsland Lakes and Lake Tyers Catchment. They are called 'European Green Shore Crabs' which have taken over areas where our native crabs once lived!

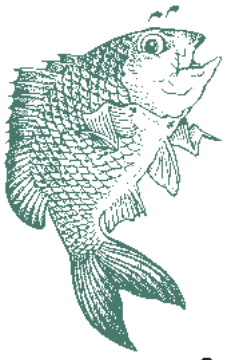
When you are out and about exploring our saltwater waterways, have a look out for these exotic pest crabs amongst the rocks and the edges of our waterways.

These European Green Shore Crabs have five spikes on each side of their eyes and their last pair of legs are sharp and slightly flattened at the tips. They have no swimming paddles and are greenish in color.

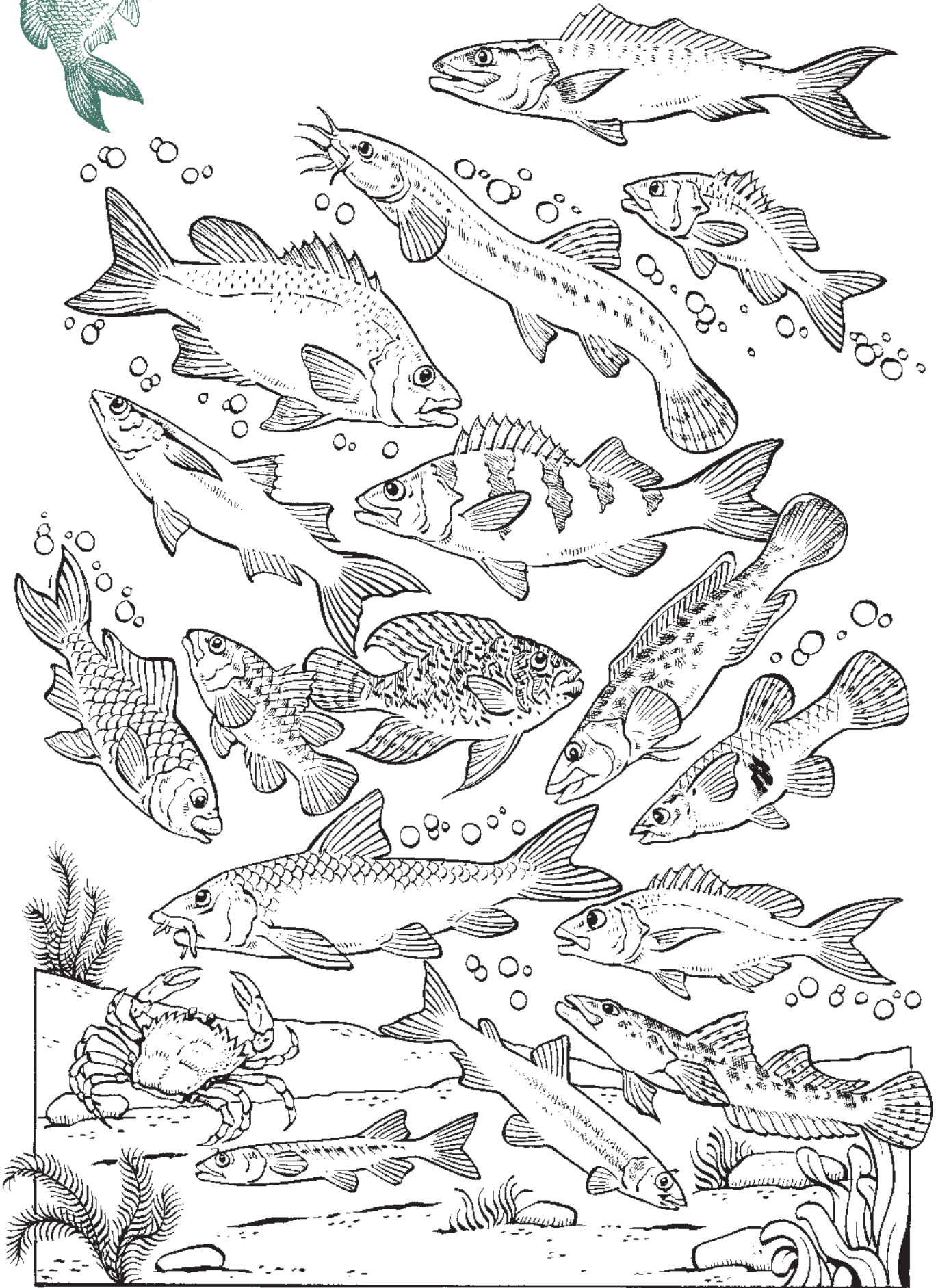
In East Gippsland, you can catch as many as you like but you must not return them back into the water because they are a pest and you must never use them as live bait for fishing.

These are the rules and they are in place to help keep their numbers down and to prevent them from spreading to other waterways.





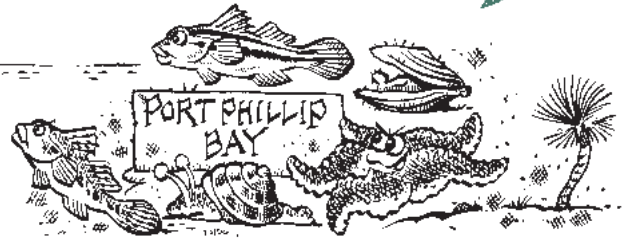
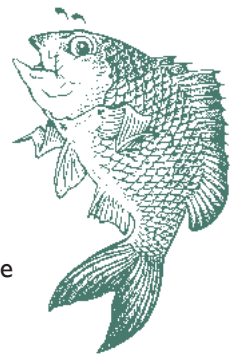
Pick the Pest



Alert! Alert!

Potential Exotic Pest Fish

We already have so many existing aquatic exotic pests that have caused us so much grief but there are also many more potential exotic pests that would love to move here and set up home in this beautiful part of Victoria. We do not want you to bring any more pests here or spread the ones we already have!



Alert! Alert! Redfin Perch

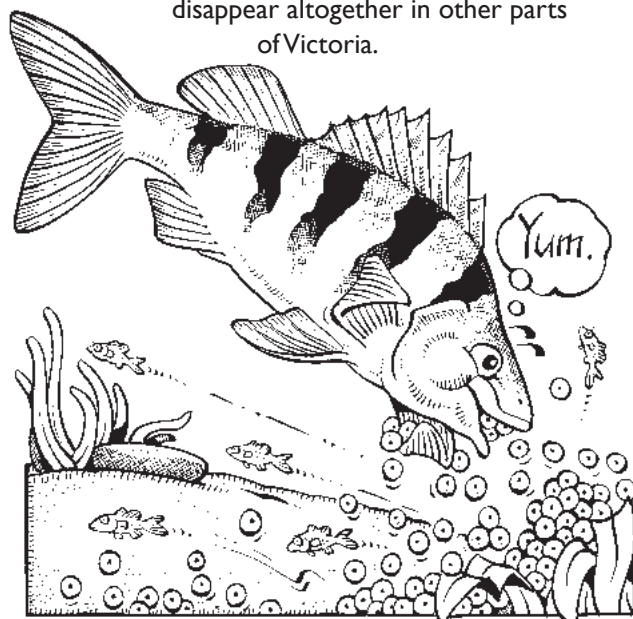
Perca fluviatilis

Redfin Perch are sometimes called English Perch and are widespread throughout Victoria.

These pest fish were introduced to Australia over a hundred years ago as they are great to catch and are good eating. Our local indigenous freshwater friends have heard that there are Redfin up in our rivers but no-one has seen any yet and we want it to stay that way.

We do not want Redfin to come here, as we have been told they love to eat almost everything including smaller freshwater fish and the eggs of our large freshwater friends, Murray Cod and Golden Perch, who live in other regions. Imagine what would happen to my small and large freshwater friends if Redfin came to live here with us!

I have also been informed that Redfin can spread a viral disease that affects us, the native fish! It is thought that this virus may be another factor in seeing some of our smaller freshwater species disappear altogether in other parts of Victoria.



Alert! Alert! Northern Pacific Seastar - *Asterias amurensis*

This exotic pest is not a fish but a Sea-star and we have been told that it is one of the worst aquatic exotic pests to come to Victoria.

It's name is the Northern Pacific Seastar and I thought it should be included in this booklet. This Seastar has had severe impacts on other native species in the big bays around Melbourne.

The Northern Pacific Seastar breeds quickly and produces over fifteen million eggs a year. They have huge appetites and love to eat a range of different shellfish, sea squirts, crustaceans, sponges, eggs of other species and even other seastars.

There are over twelve million Northern Pacific Seastars in Port Phillip Bay in Melbourne and now they are trying to come our way and have already been found at Tidal River at Wilson's Promontory, which is not far from here.

These Seastars would love to settle and breed in the Gippsland Lakes as there is abundant amounts of food including shellfish, which is also the diet of our local native species, so we really need to keep these exotic pests from ever coming here!



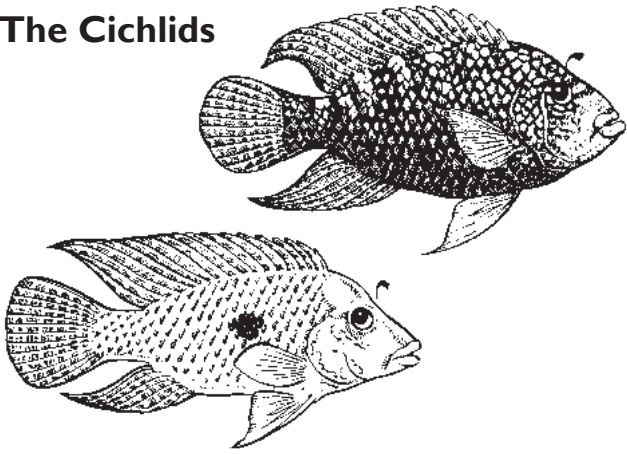
The native –
Eleven Armed
Seastar

Exotic pest -
Northern Pacific
Seastar



Alert! Alert!

The Cichlids



These fish are extremely aggressive and if they ever escaped into our freshwater streams, they have the potential to take over everything; our homes, our food, everything!

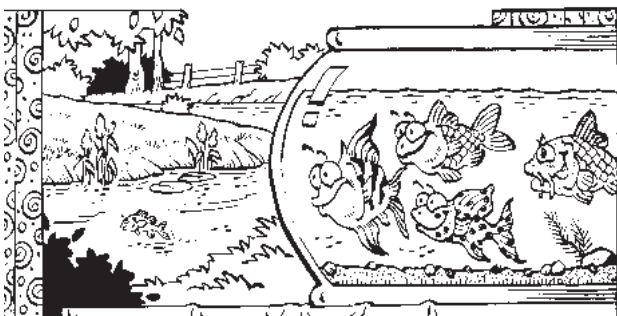
Cichlids are highly prized aquarium fish and come in many different brilliant colors and were brought here from overseas.

Up in the warmer parts of Australia, we have heard that two cichlids species, the Black Mangrove Cichlid and the Mozambique Tilapia have escaped from aquariums into the local waterways, causing severe problems for our tropical native friends.

We know some cichlids live in the Hazelwood Power Station cooling pondage in other parts of Gippsland but we have not heard of any cichlids in our natural waterways in East Gippsland. There are many different species of cichlids who can tolerate cooler waters like the Pearl and Jack Dempsey Cichlids and these can easily be brought from the local aquarium shops.

These cichlids have escaped into New South Wales waterways and we know that they like to live outside the aquarium fish tank and can breed very quickly and therefore are very difficult to get rid of once they are in the wild.

There is a huge potential for different cichlids to survive here and they could easily set up home in our waterways, if they became unwanted dumped aquarium pets.



Alert! Alert!

Oriental Weather Loach

Misgurnus anguillicaudatus

The Oriental Weather Loach does not live here yet but it does live in other waterways in Victoria and we do not want it to end up here!

I have been told this exotic pest fish can live to over ten years and can lay thousands of eggs at a time and also loves to eat our native fish eggs.

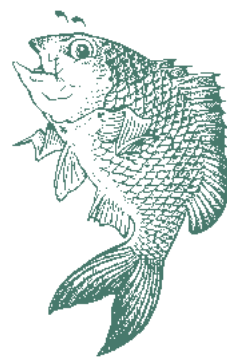
This pest fish can burrow and live underground to avoid predators. This in turn makes the water dirty and uproots our aquatic plants where the bulk of our own food lives.

The Oriental Weather Loach is very adaptive to drought conditions as it can burrow into the mud when conditions are dry and can remain there until the rains come again.

Like European Carp and Eastern Gambusia, this fish is listed as “noxious” and should never be returned back into waterways alive!



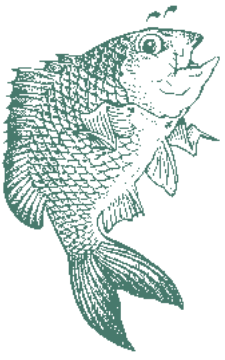
Fish Word Search



Can you find the words listed below, they might be forwards, backwards, up, down or diagonal!

L	T	R	E	V	A	L	L	Y	A	T	L	A	I	T	N	E	T	O	P
E	X	O	T	I	C	X	B	L	A	C	K	F	I	S	H	N	M	X	Z
U	L	M	K	Z	Q	A	G	D	N	O	M	L	A	S	Z	Y	J	W	Q
R	Q	A	B	E	S	G	I	P	P	S	L	A	N	D	L	A	K	E	S
O	Z	N	Q	S	P	W	M	T	U	O	R	T	P	A	E	Z	R	I	J
P	L	E	Z	U	M	U	L	L	E	T	R	H	V	O	S	B	A	R	C
E	L	G	A	L	A	X	I	A	S	Q	J	E	A	G	T	R	S	Z	W
A	O	A	R	M	V	R	J	L	A	R	V	A	E	B	U	N	E	K	A
N	G	N	T	H	A	B	I	T	A	T	K	D	Z	G	A	A	A	L	T
C	S	H	O	Y	K	R	W	U	Q	Y	G	L	O	N	R	T	S	B	E
A	L	R	V	X	P	O	Q	D	M	N	G	L	R	D	Y	I	T	Z	R
R	J	W	X	R	I	U	A	Z	O	I	D	R	J	W	A	V	A	X	W
P	E	S	T	C	A	O	S	P	R	F	M	W	A	M	A	E	R	B	A
E	U	A	A	I	W	K	U	R	I	D	Q	K	R	Y	Z	K	A	M	Y
R	W	Q	M	C	U	T	E	S	F	I	N	G	E	R	L	I	N	G	S
C	Z	J	B	H	D	J	H	K	N	O	I	S	A	V	N	I	W	C	Q
H	C	A	O	L	R	E	T	H	A	E	W	J	D	A	F	J	N	B	W
R	J	E	U	I	N	D	I	G	E	N	O	U	S	D	E	W	Z	G	X
Z	D	I	R	D	L	W	G	Z	R	W	L	L	E	H	C	T	I	M	E
W	A	F	I	S	H	I	N	G	Q	D	J	R	Q	E	F	Y	H	R	U

- | | | | | | |
|-----------|-------------|------------|----------|-----------|--------------|
| aquarium | European | Gippsland | larvae | pest | trevally |
| bass | carp | Lakes | logs | platypus | trout |
| blackfish | exotic | goldfish | Mitchell | potential | tupong |
| bream | fingerlings | grayling | mullet | redfin | waterways |
| cichlids | fishing | habitat | native | salmon | weatherloach |
| crabs | flathead | indigenous | noxious | seastar | weir |
| estuary | galaxias | invasion | perch | Tambo | |

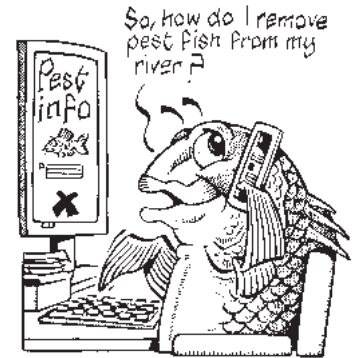


Chapter 4

How did the different Exotic Pests get here??

The arrival of all these new exotic pest fish arrivals has frightened me and my friends, and we are fearful to what is going to happen in the future! As a result of all these pest invasions over the years, I have seen a lot of my friends disappear or forced to look for new homes a long way from here.

I was determined to find out why these new exotic pest species have ended up here and what we can do with your help to stop their spread. I would like to thank all my friends for informing me of the following information that gives everyone a better understanding of where all these exotic pests species came from.



The Carp Invasion

Carp were first introduced here as an ornamental fish. Some were placed in rivers for food and the first species of introduced carp brought here did not spread. But in the 1960s, a family at Boolarra in Gippsland imported a new carp strain and grew them in outdoor ponds and wanted to sell them for people to eat. Once the authorities heard about their operation, they tried to close it down and eradicate all the fish but it was too late as the carp had already been released in the La Trobe River and also the Murray River and have spread ever since. Flooding has also assisted with the spread of European Carp.

This strain of carp as we know them today, love our river homes as there is so much more space to cruise around in large numbers, they enjoy being “bullies”, eating all our food and taking over our homes, and making our once clear water, dirty and smelly.

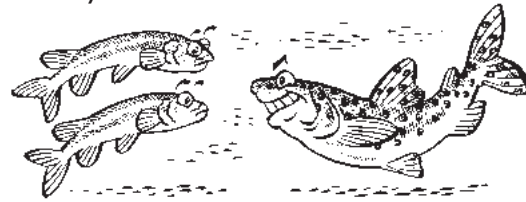
European Carp can go where they like, as they love freshwater but can tolerate saltwater conditions as well.

Carp have had a massive impact on so many of my native friends who once enjoyed living in this part of the world.



Better Fishing

Many years ago, people came to live in East Gippsland from other countries. Back then, authorities introduced many different fish species for a range of reasons, including species for anglers to catch and to eat as they did when back home.



One of the most popular exotic fish brought to Australia were the flashy, fast swimming trout. In the early days, trout had a big impact on some of our smaller freshwater native friends such as the Galaxias. In some cases, we have seen some Galaxias species disappear altogether from the streams that once were once their home.

Today, trout are only put into selected waterways which is a good thing because it allows fishermen to enjoy them and also now protects our smaller native fish species from predation.

These days, government agencies and community programs focus on restoring habitat and improving the health of the waterways to help recover the smaller native fish species like the Galaxias back to where they once lived.

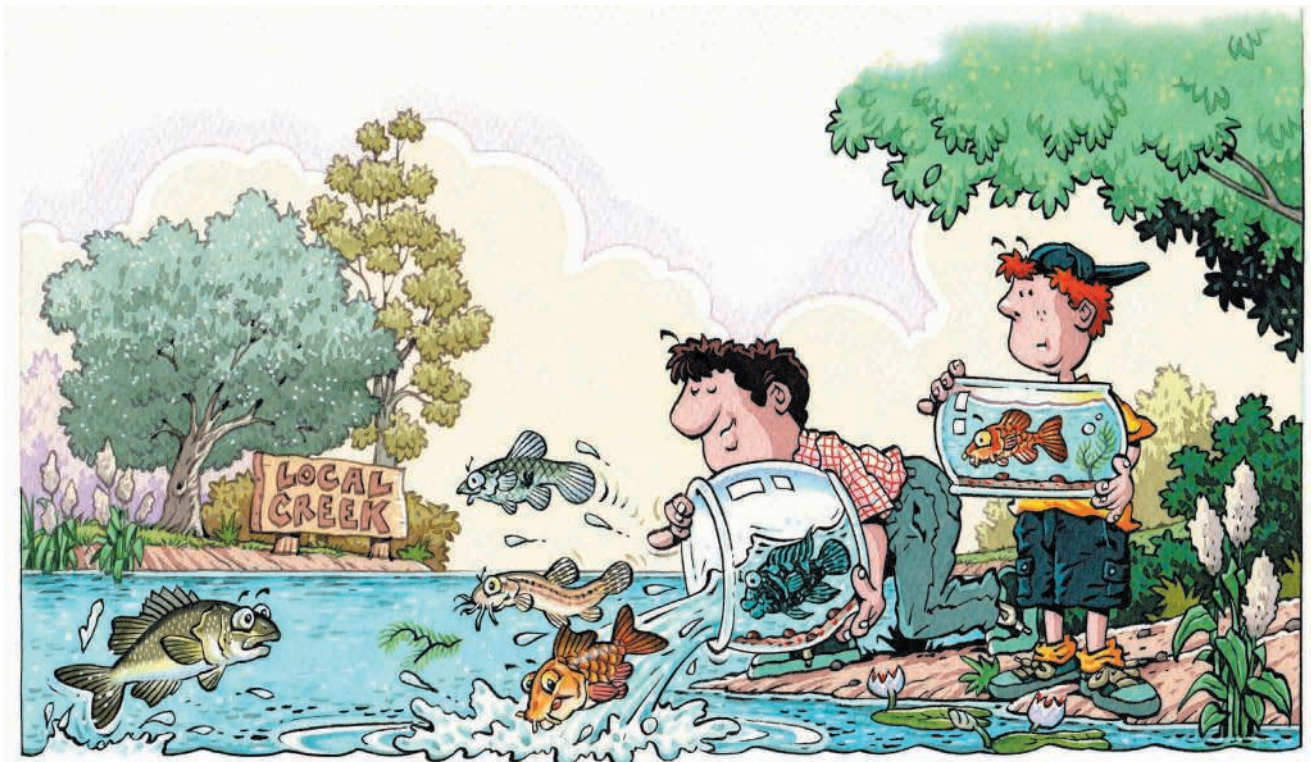
Another exotic species, the English Redfin was also introduced to improve fishing opportunities as they are a great eating fish. Some of my freshwater friends claim they have seen them up in the rivers and I have heard they carry a virus that can affect our health, so we do not need them here in our freshwater rivers!

The Unwanted Aquarium Fish

There are so many different types of aquarium fish that we can buy in the aquarium shops, and so many have the potential to become pests in our waterways. People love aquarium fish for their fish tanks and ponds as there are so many different shapes and colours to choose from and they all come from many different countries across the world.

Some of the most potentially dangerous exotic pest fish like the cichlids are kept in aquariums and if they did escape or were released, we may see many native species disappear forever.

Goldfish are another popular aquarium species but there are lots of others that you can buy from aquarium shops who would love to live in our waterways compared to a fishbowl. Aquarium fish like the Black Mollies are frightening as they can live in both fresh and salt water and the pretty Swordtails are capable of breeding very quickly, so both have the potential to become exotic pests if they escape from their fish tanks.



Aquarium Escapee Story

Little Johnnie has received a couple of goldfish for his birthday.

To begin with, Johnnie loves his goldfish and named them Marmalade and Goldie. Soon, Johnnie becomes bored with his fish and mum is left to feed them and clean out their fish bowl.

His mum finally has had enough and releases Marmalade and Goldie into the local stream that flows through their farm and thinks she is doing the right thing as she does not want to kill them. When she releases the fish, she also releases the aquatic plants and snails that also lived in this fishbowl and the like goldfish, the plants and snails are not native species either.

Marmalade and Goldie love their new home, there is plenty of space, clean water and lots of food. Soon they breed quickly laying thousands of fish eggs. The baby fish larvae hatch and grew quickly and suddenly, there are thousands of goldfish living in a section of the fresh water stream. The plants and snails that were in the fishbowl have quickly found a space to grow as well and now have taken over as all the native plants and snails are beginning to disappear.

Discussion

Did John's mum DO THE RIGHT THING?

What are the other choices?

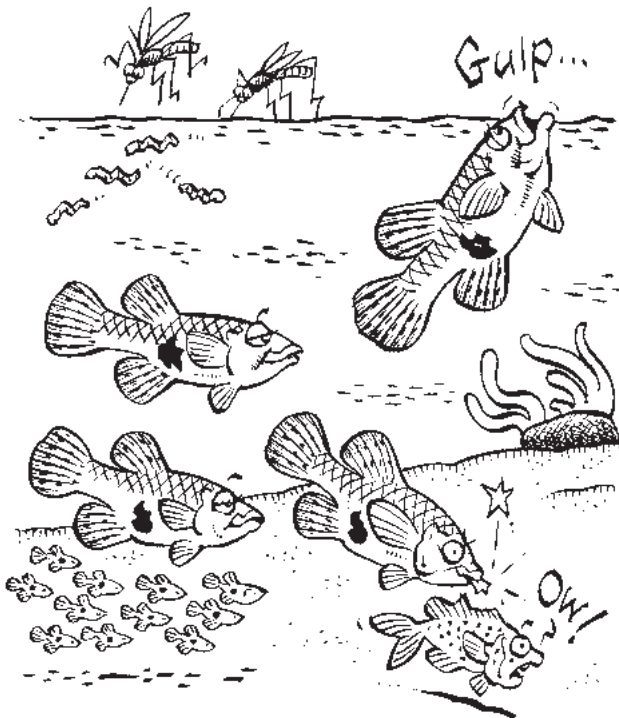
Controlling Other Pests

People love living along our waterways but so do the mosquitoes. Baby mosquito larvae live in water before hatching and flying away. People hate mosquitoes and thought it was a great idea to bring to Australia, the Eastern Gambusia, also called the “Mosquito Fish”, to control and eat all the mosquito larvae that live in the water. This was a bad idea!

The Eastern Gambusia were released here and loved it!

As a result, they quickly spread throughout our waterways without having any impact of controlling the mosquitoes as there was plenty of other food to eat and places to explore! These fish are aggressive and nip our fins which can lead to infections and in some cases death. These fish have also caused the decline of our smaller native fish, especially some galaxias species. Eastern Gambusia can withstand extreme water conditions which has helped with their spread and when there is not enough oxygen in the water, they can come to the surface and gulp air – something none of us native fish can do!

The other scary thing is that these exotic pest fish give birth to live young and do not lay eggs.

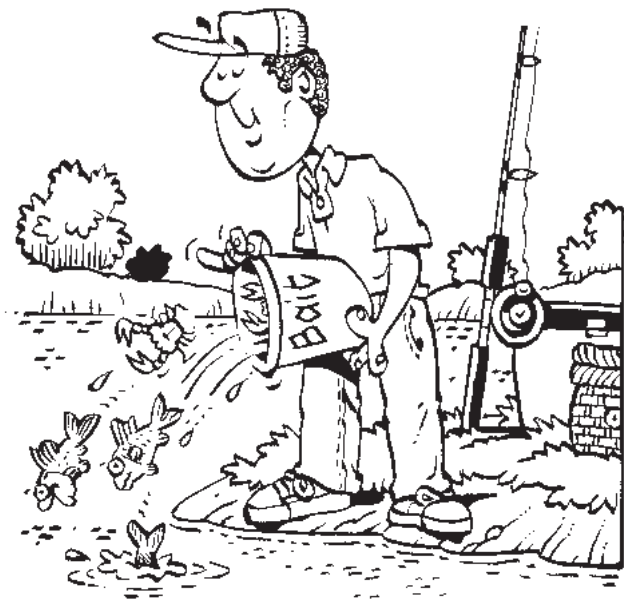


Bait Release

Along the waterways, fishing has become very popular and at times, people use live small fish and live crabs as bait.

Sometimes these small fish are aquarium fish or have been collected from other places and do not belong in the waters where they are being used as live fishing bait.

As people have cars and boats, they can move from one waterway to another, and can go fishing in a lot of different places in one day. At the end of the day, fisherman will often let the live small fish or crabs go into a streams and rivers where they do not belong instead of bringing them home or returning them back where they were first collected.



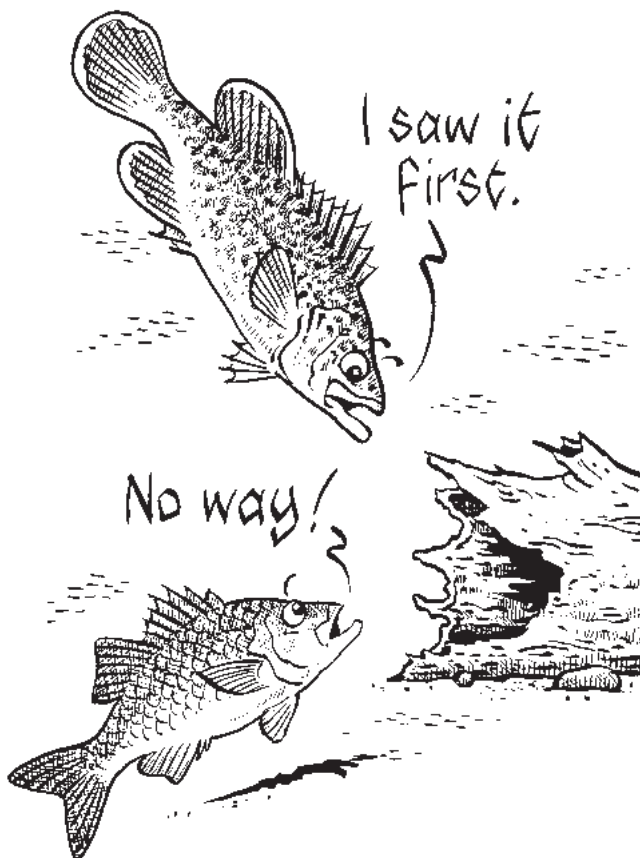
As a result, many different fish such as goldfish and crabs have turned up unexpectedly in places they do not belong and have seen them spread quickly. The European Green Shore Crab has also been introduced throughout the waterways of East Gippsland through bait release and now are in huge numbers. We much prefer eating the native crabs, but these are hard to find as the European Shore Crab has taken over their space.

Native Fish versus Native Fish

We have so many different native cousins and thank goodness we all live in different places throughout Victoria. My kind, the Black Bream love living in the East Gippsland rivers and estuaries and are found also in other places throughout Victoria where we belong. Our other native fresh water cousins like the Murray Cod live up in the Murray River, which is a very long way from here.

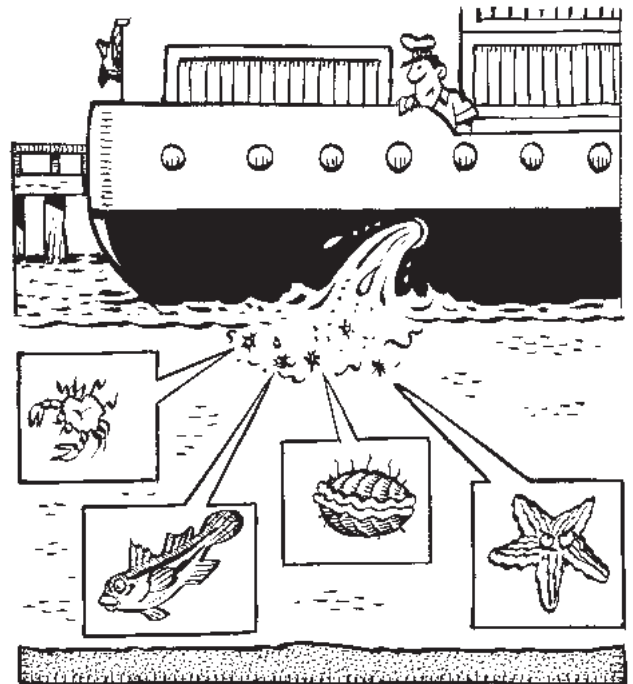
Thank goodness, we all live in different places as then we do not have to compete with each other, we all have plenty of space, lots of homes and plenty of food to go around.

But things can go very wrong when people transfer native fish from their own native homes and put them into places where they do not belong. When this occurs, there are too many of us in the one place looking for the same food and shelter. This has resulted in the disappearance of some native species from their own special place.



Hitchhiked Here from Other Places

One of the strangest ways that aquatic exotic pest species have arrived here in Victoria is through the discharge of ballast water into our big ports in Melbourne from boats that have arrived from other countries.



When big boats come into our big city ports from other places, they discharge the water from their hulls that have kept their boats stable when travelling long distances. The ballast water that discharged into our waters carries microscopic aquatic species from other places. Although native in their own place, they do not belong here, and have quickly become pests in our waters.

Ninety-nine known aquatic exotic pest species have hitchhiked into Melbourne's bays through the discharge of the large boat's ballast water after entering Melbourne's big ports.

This is how the Northern Pacific Seastar arrived into Port Philip Bay in Melbourne. This Northern Pacific Seastar is now one of the worst aquatic exotic pest species ever recorded in Victoria, due to the massive impacts on our different native species.

Aquatic pest species like the Northern Seastar have made it halfway across, so we always have to be careful and look out as we do not them ending up in our waters.

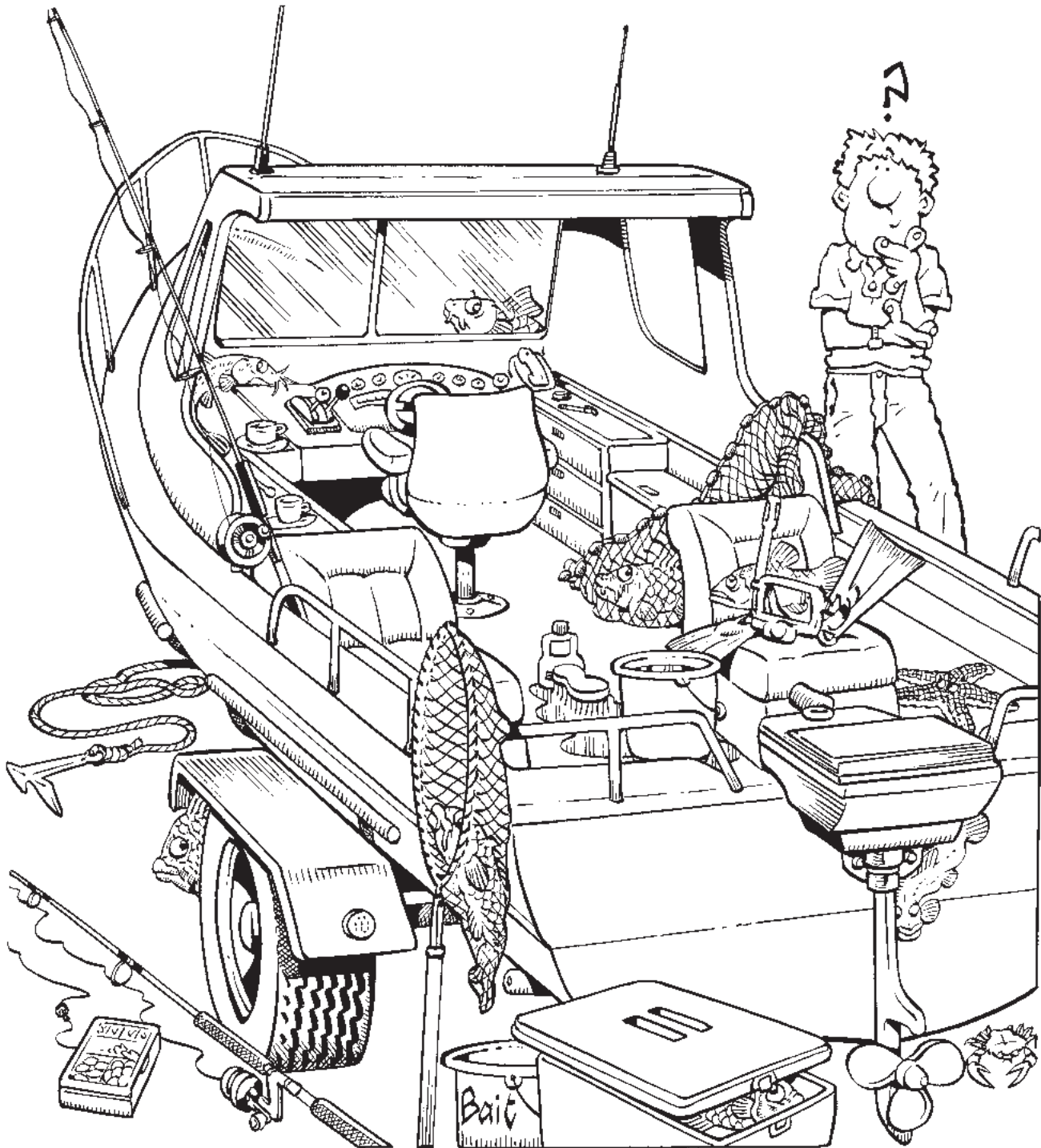
Hitchhiked on Boats and Equipment

People love fishing and love travelling to different places around the country to catch fish. These days, many people own boats and these boats may be towed to different locations on trailers every weekend. On these boats, people have and use lots of different equipment to catch and keep fish live for bait and eating purposes.

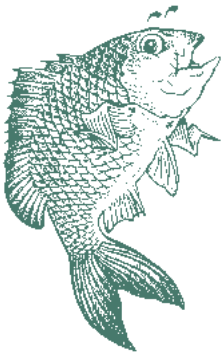
Different aquatic exotic pest species have found a way to hitchhike into different waterways via these boats and their equipment as well as their diving and fishing gear. People do not realise that they have these unwanted exotic pests on-board and they maybe getting a free ride to other new waterways across our state

Find the Pest

Find the 10 pests hiding in the boat.



activity

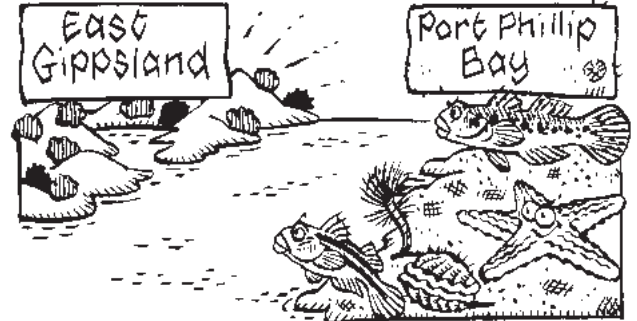


Chapter 5 How you can help?

We all live in a beautiful part of Victoria.

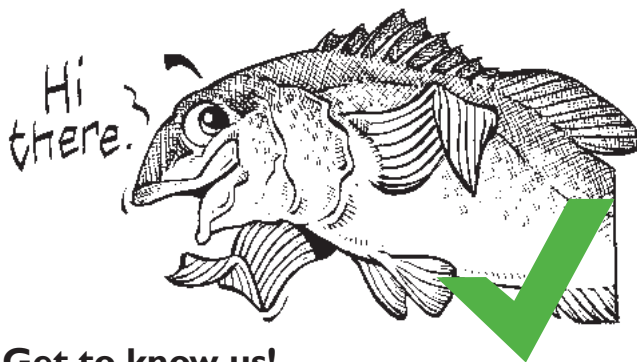
We already have to share our homes with existing aquatic exotic pests such as European Carp but there are many more different pest species, some we have mentioned that would love to come and live here.

We **DESPERATELY** need **YOUR** help to stop that from happening.



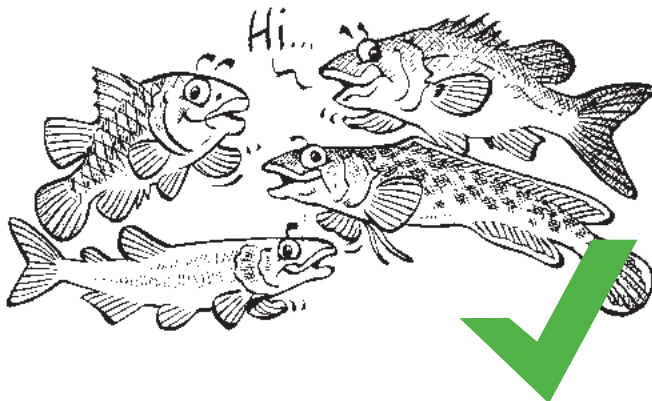
You can make a big difference!

Become a “Native fish” guardian!

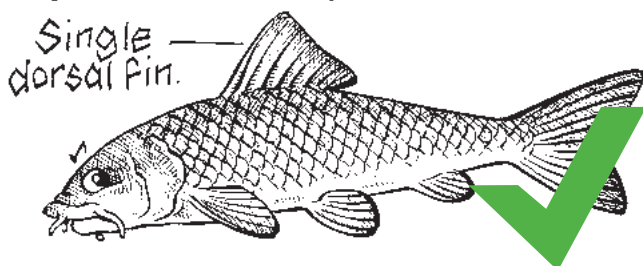


Get to know us!

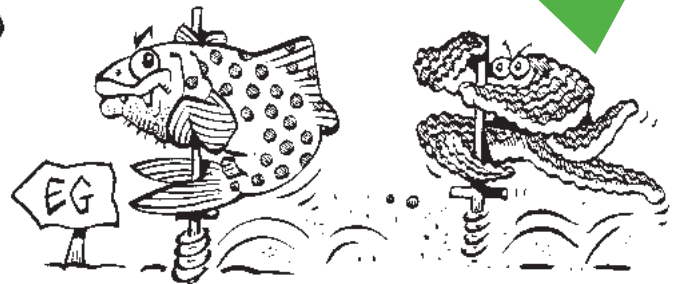
We are the native fish and we belong here!



Get to know the exotic pest species that already live here!



Get to know the potential exotic pest species that want to live and move to here!



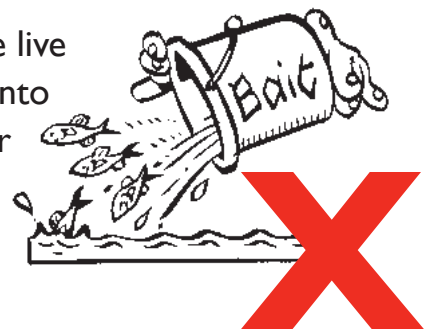
Never return an exotic pest species back into the water.

Dispose of it properly.

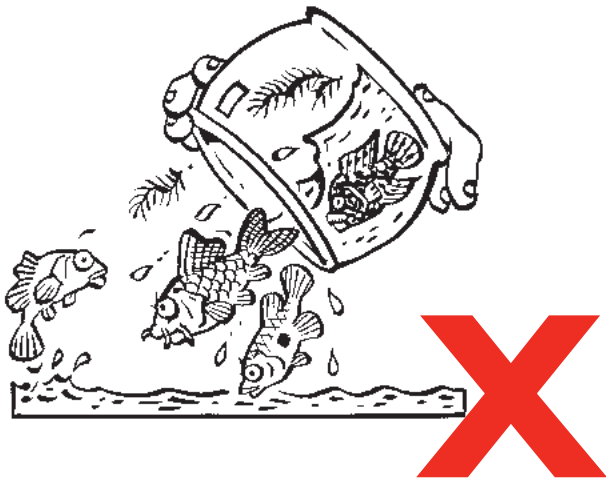


Never use live carp as bait in freshwater

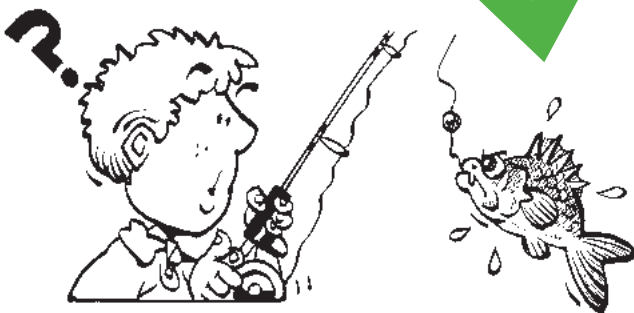
Never release live bait fish back into the water after fishing.



Never release any unwanted aquarium fish back into our waterways.



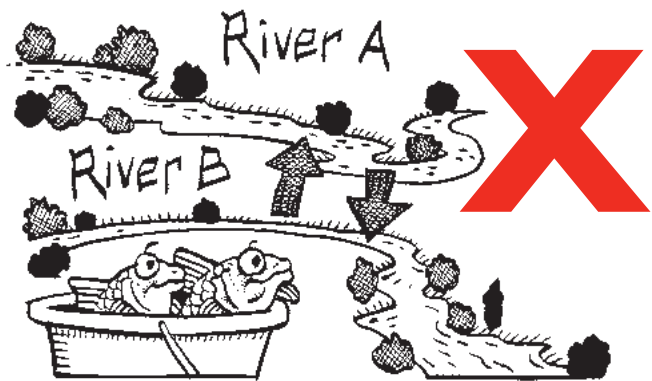
Always look out for any new unusual fish and aquatic plants in your waterways.



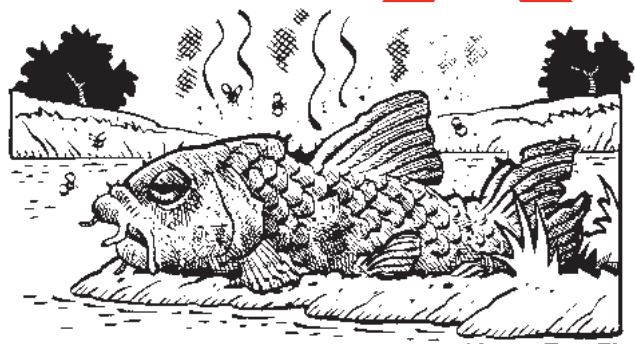
If you think you have caught an unusual looking fish, take a picture for positive identification and show someone who has the knowledge .



Never transfer live fish from one waterway to another – it is illegal!



Never dump pest fish on the riverbanks as that can spread disease – take them home for compost or bin them.



Know your fishing rules and make sure you know the native fish size and bag limits.



Get to know fishing rules and regulations in regard to the exotic pest species that live in East Gippsland.



Take only what you need for a feed and correctly release the other native fish back into the water to live another day.



With friends, organise a fun carp fishing day and help remove them from our rivers.



Take home all your unwanted rubbish, especially plastic bait bags if you have been fishing or camping. Plastic rubbish gets washed down in the floods and ends out into the oceans and this has massive efforts on the health of all ocean birds and mammals.



If you see someone doing something illegal - ring 13 FISH - 13 3474



Get your Parents Involved! We need everyone's help!

What to do with unwanted aquarium fish.

If you do not want your fish and your friends do not want them or you going away, tell your mum you can take them back to the fish/pet shop, or take them to an organisation like a nursing home who may like them.



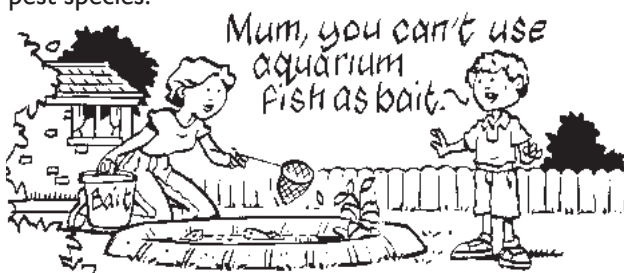
Remember aquarium plants and snails can also become aquatic pests!

Always remember that the aquarium plants and snails that lived in the fishbowl can also become aquatic pests, so make sure they go in the rubbish bin along with any rocks that were once in your aquarium.



Let your parents know that it is illegal to use live aquarium fish as bait.

If you are going fishing with your parents and using aquarium fish as bait, tell your parents that this is illegal and has caused the spread of many exotic pest species.



If you are using live fish and crabs as bait, let everyone know not to release them back into the water after going fishing.



Important to clean that boat!

If you have gone fishing with your parents in the boat and plan to travel from one waterway to another, tell your parents that it is a great idea to drain the water from boat and gear and clean and wash your boat and equipment including the dive equipment to kill any pests that may be hiding in the boat.



Make more homes for us!

If you and your family live along a waterway, get your parents to plant native vegetation along the waterways to help us! Tell them to leave logs and trees if they fall into the water to make more homes for us. Also, fence along the river to keep out the farm animals, so the vegetation can grow and stop erosion along the river banks.

Get involved with local communities

Have everyone in your family get involved in local environmental community groups(Landcare, Waterwatch, Fishcare, Trust for Nature) and help with the following:

- Learn about and replant indigenous plants along your local waterways to help restore native fish habitat.
- Fencing off land along streams and rivers to prevent stock from eroding the banks.
- Help with any water monitoring program in the area where you live.
- Go to local events that are assisting in local health of the waterways in your area.
- Protecting and restoring natural habitat along local waterways.



Selecting the right fish species for your dams

If you have a farm dam and want to stock fish, make sure your parents research and undertake the following:

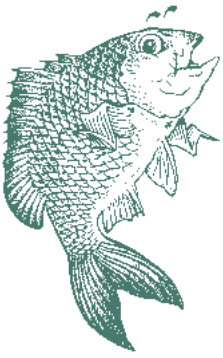
- Stock native fish that are suitable for your dam.
- Buy native fish from a registered fish breeder.
- Make sure the dam is nowhere near any natural waterways so if there is a flood event, the fish cannot escape into the local streams.
- Also encourage your parents to get involved in any local native restocking programs.



And last --- If you see someone doing something illegal,

Please ring 13 FISH - 13 3474

“You and your parents can make a difference and just by reading this resource book, you have made the first positive step forward!”



Additional information

Fisheries Victoria

www.vic.gov.au/fisheries

To find out about aquatic exotic pests:
Type into Search Option Bar - Marine pests and diseases.

Invasive Animals Cooperative Research Centre

www.invasiveanimals.com/

www.pestsmarts.org.au/

Fish Habitat Network

www.fishhabitatnetwork.com.au

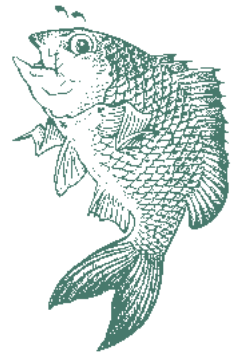
www.facebook.com/fishhabitatnetwork

PestSmart Connect

www.pestsmart.org.au/

Other beneficial websites

www.delwp.vic.gov.au/ari



Acknowledgements

This booklet was co-funded by the Victorian Government through:

- Communities for Nature Grant.
“The Care groups taking practical action to enhance and protect our local environment”.
- The Gippsland Lakes Environmental Fund.
“Care Groups Enhancing Biodiversity of the Gippsland Lakes”.
- The Recreational Fishing Licence Trust

Special thanks to Renae Ayres, Dr Tarmo Raadik, (Arthur Rylah Institute), Natalie Jenkins and April Wilkins, (East Gippsland Landcare Network) and Fisheries Victoria.

Also thanks to staff and committee of Fishcare Victoria Inc and a big thank you to the Fishcare East Gippsland Inc volunteers for their support and advice in regard to this publication.

Produced by:

Fishcare East Gippsland Inc
574 Main St, Bairnsdale 3875
Ph. 03 51520456

Written and compiled by:

Jennifer Allitt

Published:

July 2015

Graphic design:

Griffin Graphics, Griffin.Graphics@bigpond.com

Fish Illustrations:

Paul Lennon, paulleennonillustrator@gmail.com

Copyright:

This work is copyright. Apart from any other use permitted under the Copyright Act 1998, no part maybe reproduced by any other process, nor can any other exclusive rights be exercised, without the permission of Fishcare East Gippsland Inc. (Incorporation No. A0042886W).

Disclaimer:

This book may be of assistance to you but Fishcare East Gippsland Inc and it's employees do not guarantee that this resource booklet is without flaw of any kind or wholly appropriate for your particular purposes and therefore disclaims any liability for any error, loss or other consequences that may arise from you relying on the information in this publication.

Answers to page 12 crossword:

- | | |
|----------------------|----------------|
| 1. Australian Bass | 6. Trevally |
| 2. Australian Salmon | 7. Black Bream |
| 3. Estuary Perch | 8. Galaxias |
| 4. Blackfish | 9. Mullet |
| 5. Grayling | 10. Tupong |

