

# What fish is this?

A guide to freshwater fish in NSW



The 'fish friendly farms' team has produced this guide to help you identify native fish that could be in your streams and understand what they need to survive and thrive. We have also included fish species that have been deliberately or accidentally introduced into the rivers and creeks of NSW. In many cases, these 'exotic' fish have rapidly colonised the waterways, out-competing our native fish and further adding to the problems they face. We hope this information will inspire you to help restore stream habitat and streambank vegetation, as these actions will encourage native fish to return to your waterways.

## Guide to symbols



These are species that are listed as threatened or otherwise protected by law. It's illegal to catch and keep any protected or threatened species, and any that are caught accidentally must be returned immediately to the water unharmed. There's more information on page 21. In some cases, it may only be in certain places that the species is protected. If so, this is indicated beside the symbol.



These are pest species that have been listed as 'Noxious' by law. Noxious species can be Class 1, 2 or 3. This is indicated beside the symbol. There's more information on page 21.

## Native Fish

### Australian bass

*Macquaria novemaculeata*



Maximum fish length 60cm

Found in rivers, streams, coastal lakes and brackish estuaries. Prefers the thick cover of aquatic vegetation in rock and gravel-bottomed pools. Undertakes extensive migrations. A water level rise during winter enhances breeding success. Adults

consume other fish, insects and crustaceans. During summer months diet comes largely from terrestrial sources, such as insects falling from riparian vegetation. Disappears from streams upstream of migration barriers such as weirs.

### Australian grayling

*Prototroctes maraena*



Maximum fish length 30cm

Occurs on the South Coast in catchments from the Clyde River southwards but occasionally found as far north as the Central Coast. Habitat includes large and small clear coastal rivers with moderate flows and gravel substrates. Spawns in freshwater. Eggs and larvae are washed downstream to mature

in brackish estuarine waters and fish return upstream to breed. A shy species that forms fast moving shoals, feeding mainly on aquatic algae, insects and micro-crustaceans. Highly sensitive to handling and environmental change. Emits an unusual cucumber-like odour when freshly caught.

### Australian smelt

*Retropinna semoni*



Maximum fish length 10cm

Abundant and broad range throughout many coastal and inland drainage systems. Usually found in flowing water. Forms large shoals near the surface or around vegetation and woody debris. Aquatic vegetation is also

an important site for laying eggs. Diet includes insects, micro-crustaceans and algae. Preyed upon by many larger fish species. Emits an unusual cucumber-like odour when freshly caught and is very sensitive to handling.

**Blue catfish***Arius graeffei*

Maximum fish length 50cm

Occurs but is generally uncommon in northern coastal drainages. Found primarily in rivers and lagoons at low altitude as well as coastal marine waters and brackish estuaries. Males display intensive parental care, with mouth brooding of a small number

of relatively large fertilised eggs for up to 8 weeks, during which the male does not feed. Diet is omnivorous, comprising small fishes, prawns, vegetation, terrestrial and aquatic insects, molluscs and detritus.

**Bony bream***Nematalosa erebi*

Maximum fish length 47cm

One of the most widespread and common fish of inland Australia. Found in NSW throughout the lower altitudes of the Murray-Darling system. Most common in the shallows of turbid, slow-flowing drainages, also found in large floodplain lakes and desert bores. Water flow increase triggers spawning.

Lays up to several hundred thousand semi-buoyant eggs. Forms large shoals near the bottom, feeding on benthic algae, small invertebrates and decaying organic matter. Important food source for larger fish. Very susceptible to oxygen depletion and first to die when ephemeral habitats begin to dry up.

**Bullrout***Notesthes robusta*

Maximum fish length 30cm

A bottom-dwelling fish usually found within 50 km of the coast, in still or slow-flowing freshwater streams over rock, mud or gravel substrates. Predominantly located amongst aquatic vegetation or woody debris. Normally frequents fresh water but migrates downstream into estuaries

to breed. Fairly inactive species, spending the majority of its time stationary on the bottom or amongst weeds waiting to ambush prey. Both adults and juveniles have venomous spines on the dorsal, anal and pelvic fins, so should not be handled, even when dead.

**Carp gudgeon species***Hypseleotris sp.*

Maximum fish length 4.5cm

Range covers the Murray-Darling River system and east coast streams as far south as the Bega River. Usually found around aquatic vegetation in slow-moving, often turbid creeks or in still waters of lakes and billabongs. Low flows and rises above 21 °C trigger

spawning. Females lay a clutch of eggs on a hard surface which the male guards against intruders and fans with his pectoral fins. Eats aquatic invertebrates, insect larvae and some plant matter. Up to 4 different species which are difficult to distinguish and often hybridise.

**Climbing galaxias***Galaxias brevipinnis*

Maximum fish length 27.8cm

The largest Australian galaxiid. Found in clear flowing, shaded streams with rocks and boulders that drain to the east of the Great Dividing Range. Also translocated to the Murray-Darling system via the Snowy hydro scheme. More abundant amongst stones and woody debris with good native

vegetation cover. A solitary, migratory fish renowned for the juveniles' unusual ability to climb vertical damp surfaces (such as waterfalls) using their large pectoral and pelvic fins as suction cups. Feeds on a variety of insects and amphipods at the surface and near the bottom.

**Common jollytail***Galaxias maculatus*

Maximum fish length 19cm

The most widely distributed galaxiid species, most abundant at low elevations in still or gently-flowing streams, rivers and lakes that drain to the coast. Endures a wide range of salinity levels, permitting downstream migration in autumn to estuaries to spawn, depositing eggs and sperm on

fringing vegetation. Larvae stay at sea, returning as juveniles in large shoals to coastal rivers. Feeds on a wide variety of small aquatic and terrestrial insects. Important component of the whitebait industry. Known to disappear entirely from streams upstream of migration barriers such as weirs.



**Congoli**

Found in coastal drainages in the southeast of the state. Primarily a bottom dweller of brackish estuaries, often remains partly buried under logs, aquatic plants and amongst leaf litter. Breeds in the ocean but the females are known to embark on migrations

*Pseudaphritis urvillii*

Maximum fish length 34cm

far inland where they are found in slow-flowing freshwater streams. Diet consists of a variety of insects, crustaceans, molluscs, worms and fish. Buries into the soft creek bottom and waits to ambush passing prey. Capable of rapid bursts of swimming when disturbed.

**Cox's gudgeon**

Range covers most of the NSW southeast coastal drainage, however it is rarely located close to the sea. Commonly found in flowing upland waters, often in rapids adjacent to fringing vegetation. During upstream migration they

*Gobiomorphus coxii*

Maximum fish length 19cm

have been seen to climb waterfalls and steep dam walls. Females lay eggs on rocky surfaces. The fertilised eggs are then guarded and fanned by the male until they hatch. Diet consists of small aquatic insects, including mosquito larvae.

**Crimson-spotted rainbowfish**

Range encompasses coastal drainages east of the Great Dividing Range, from Hastings River (NSW) north to the Burnett River (Qld). Inhabits a variety of habitats, including rivers, creeks, ponds, drains, coastal lakes and

*Melanotaenia duboulayi*

Maximum fish length 13cm

reservoirs. Prefers slow-flowing or still waters with dense aquatic vegetation and woody debris. Mainly carnivorous diet, feeding on aquatic invertebrates and terrestrial arthropods that fall onto the water surface. Popular aquarium fish.

**Darling River hardyhead**

Range restricted to the upper reaches of the Darling River system in northern NSW. Usually found among vegetation margins or over gravel substrate in slow-flowing, clear waters of small, creeks and streams. Large eggs are deposited

*Craterocephalus amniculus*

Maximum fish length 5.5cm

on aquatic vegetation, attaching via an adhesive thread. Hatching takes place 5 to 7 days later. Diet consists of small aquatic insects and crustaceans.

\*Only applies to fish found in the Hunter River catchment

**Dwarf flathead gudgeon**

Widely distributed throughout coastal drainages, and patchily along the Murray River and its tributaries. Usually found over mud or rock substrates, dispersed amongst plants or woody debris, in calm or slow-flowing water

*Philypnodon macrostomus*

Maximum fish length 5cm

of streams, lakes, reservoirs and brackish estuaries. Lays tear-drop shaped eggs, which attach to hard surfaces. Diet is carnivorous, feeding on a range of insects, larvae and micro-crustaceans.

**Eastern freshwater cod**

Native to most freshwater reaches of the Clarence and Richmond river systems of north-eastern NSW. Pristine, clear-flowing streams with rocks and deep holes are prime habitat. Generally found under or around in-stream cover (eg. woody debris). Diverse habitat is vital for each life cycle stage, e.g.

*Maccullochella ikei*

Maximum fish length 66cm

riparian vegetation, large boulders and woody debris. Spawns when temperatures exceed 16 °C, laying large adhesive eggs on logs and rocks. Adults known to prey on other fish, frogs, crustaceans and snakes. Larvae consume aquatic insects and zooplankton.

## Empire gudgeon

*Hypseleotris compressa*

Maximum fish length 10cm

Found in coastal drainages, in flowing or still water, more common at low elevations. Usually associated with aquatic plants and large woody debris. During breeding, males establish territories and display their brightly coloured body and fins to

attract a mate. Adhesive eggs are deposited on rocks, sand or weeds and when fertilised are guarded and fanned by the male until hatching takes place. Diet consists of aquatic invertebrates and larvae. Popular aquarium fish.

## Estuary perch

*Macquaria colonorum*

Maximum fish length 75cm

A common species in coastal lakes, estuaries and lower tidal reaches of rivers, normally favouring deep saline waters. Usually found amongst logs, rocks and other submerged objects. During winter they move to estuaries to breed,

laying numerous semi-buoyant eggs distributed over rocks and aquatic macrophytes. Primarily feeds at the surface and mid-water during winter and at the bottom in summer. Diet consists of small prawns, shrimps, fish, molluscs and worms.

## Firetail gudgeon

*Hypseleotris galii*

Max fish length 5.5cm

Commonly found at low elevations in freshwater coastal drainages, in streams, ponds, swamps and drains, usually around aquatic vegetation. During the warmer months the female lays eggs, in clutches of up

to 100, underneath rocks, logs, shells or leaves. The fertilised eggs are then guarded and fanned by the male until they hatch. Adults feed on insects, larvae and small crustaceans.

## Flathead gudgeon

*Philypnodon grandiceps*

Maximum fish length 11.5cm

Common species in drainage systems of the southeast coast and sections of the Murray-Darling system. Generally located in large, calm floodplain lakes, reservoirs and brackish estuaries. Can be found motionless over mud bottoms, and often among aquatic vegetation, but

capable of rapid swimming bursts if disturbed. Females lay a clutch of eggs on a hard surface (eg. woody debris). The fertilised eggs are then guarded and fanned by the male until they hatch. Diet includes small fishes, crustaceans, tadpoles and insects.

## Freshwater catfish

*Tandanus tandanus*

Maximum fish length 90cm

Wide natural distribution in the Murray-Darling River system and along the north coast, south to the Manning River. Coastal populations south to the Shoalhaven are introduced. Prefers sluggish or still waters of rivers, creeks and billabongs. Spawning takes place from late spring until mid-summer following complex courtships, usually in nests up to

200 cm in diameter built of pebbles or gravel. Fertilised eggs are guarded by the male and aerated by fanning with their fins. Generally bottom feeders, taking molluscs, crustaceans, insect larvae and small fishes. Susceptible to localised disturbances such as water pollution due to small home ranges. \*Only applies to fish found west of the Great Dividing Range

## Freshwater herring

*Potamalosa richmondia*

Maximum fish length 32cm

Range restricted to the coastal drainages of NSW, particularly common in rivers north of Sydney. Prefers clear to turbid, moderately flowing streams, also found in sluggish lowland rivers and estuaries.

Mature adults migrate to estuarine areas in winter for spawning, juveniles subsequently move back upstream. A fast-swimming, shoal-forming fish, whose diet consists of worms, small crustaceans and insects.



## Freshwater mullet

*Trachystoma petardi*

Maximum fish length 80cm

Found in drainages of the east coast between Bega River (NSW) and Burnett River (Qld). Generally occurs in small shoals in the deep pools of slow-flowing sections of the river. Also found in estuaries and coastal seas during spawning

runs from late summer to early autumn. Feeds mainly on algae and biofilms, also consumes decaying organic material and invertebrates. Opportunistic carnivore, preys largely on shrimps and yabbies, also known to eat freshwater molluscs and fish.

## Golden perch

*Macquaria ambigua*

Maximum fish length 76cm

Natural range throughout the Murray-Darling Basin, except at higher altitudes. Habitat varies from clear, rocky headwaters to more turbid, slow-moving rivers and billabongs, amongst fallen timber, undercut banks or rocky ledges. Migratory species, travelling far upstream

(up to 2000 km) to spawn when water temperature reaches 23 °C and water levels rise. Small, transparent pelagic larvae drift downstream with the flood waters. Opportunistic carnivore, largely preys on fish in winter and yabbies in summer, also known to eat freshwater molluscs.

## Hyrtl's tandan

*Neosilurus hyrtlii*

Maximum fish length 40cm

Occurs in the upper Darling River system, in a variety of habitats including still or flowing streams, turbid billabongs and pools. Shoal-forming species that swims into the shoreline shallows at night. Diet consists of insects, molluscs,

small crustaceans and worms. Prey is located using sensory barbels around their mouth. Sharp venomous spines are located at the dorsal and pectoral fins, and must be handled with caution.

## Long-finned eel

*Anguilla reinhardtii*

Maximum fish length 165cm

An abundant species in east coast drainages, inhabits lakes and swamps, but more common in flowing rivers. Mature adults undertake extensive annual downstream migrations to the Coral Sea for spawning. Eels spawn only once in their lifetime, and after spawning it is presumed

that the adult eels perish. Immature eels are capable of climbing vertical walls, and adults and juveniles can travel overland on wet or damp ground. Mostly active at night, but sometimes feeds during the day on young waterbirds, fish, insects and molluscs.

## Macquarie perch

*Macquaria australasica*

Maximum fish length 46cm

A quiet, furtive species, endemic throughout the cooler, upstream reaches of the Murray-Darling Basin. Also known from some major coastal drainages, including the Hawkesbury, Shoalhaven and Georges catchments. Often found in cool, clear waters of rivers, lakes

and reservoirs, favouring rocky habitat in flowing water. Spawning occurs in shallow upland streams with females laying 50,000 to 100,000 eggs which sink between the gravel and stones. Diet mainly consists of crustaceans and benthic invertebrates, particularly insects.

## Marjorie's hardyhead

*Craterocephalus marjoriae*

Maximum fish length 9.7cm

Common in coastal drainages of northern NSW. Generally found in large schools amongst aquatic vegetation, in shallow water of clear flowing streams, often over sand or gravel substrates. The usually dull

body colour turns bright yellow during the summer breeding season. Known to 'gather' food and sand from the bottom, and also feed on aquatic insects, micro-crustaceans, fish eggs and algae.



## Mountain galaxias

*Galaxias olidus*

Maximum fish length 13.5cm

Found in moderate to high elevations in both coastal and inland rivers. Prefers clear pools in small, flowing streams with cobble, gravel or sand substrate, often found amongst rocks or logs. Adults breed in spring in fast-flowing riffle areas. Adhesive eggs drift and lodge in the substrate

or attach to in-stream debris and boulders. Consumes a wide variety of terrestrial and aquatic insects, crustaceans, molluscs and worms. Revealed to be a cryptic species complex of up to 12 different species which are difficult to distinguish, *Galaxias* spp.

## Murray cod

*Maccullochella peelii*

Maximum fish length 180cm

Australia's largest freshwater fish. Wide natural distribution covers most of the Murray-Darling system. Commonly found in slow-flowing, turbid rivers and creeks at low elevations, also fast-moving, clear, rocky upland creeks. Prefers deep holes near in-stream cover such as

woody debris (87% are found within one metre of a snag) or overhanging vegetation. Seasonal high flows and temperature trigger upstream spawning migration. When waters recede, returns to the same exact log or hollow. Feeds on other fish, crustaceans and molluscs.

## Murray hardyhead

*Craterocephalus fluviatilis*

Maximum fish length 7.2cm

Naturally distributed in the Murray and Murrumbidgee River systems. Usually only persists in saline wetlands, among shallow aquatic vegetation particularly the species *Ruppia*. Spawns during the warmer

months, laying relatively large adhesive eggs that attach to aquatic vegetation. Diet consists of algae, small aquatic insects and crustaceans. Short life span of just 12 months.

## Murray jollytail

*Galaxias rostratus*

Maximum fish length 12cm

A shoaling species endemic to the Murray-Darling system. More likely to be encountered at lower elevations inhabiting still or gently-flowing waters of lakes, lagoons, billabongs and backwaters. Prefers habitat with abundant overhead

cover provided by woody debris, riparian and aquatic vegetation. Spawns in small pools laying spherical, slightly adhesive eggs that settle to the bottom. Feeds primarily on small crustaceans and aquatic insects.

## Murray-Darling rainbowfish

*Melanotaenia fluviatilis*

Maximum fish length 9cm

Occurs in the middle and lower sections of the Murray, Murrumbidgee and Macquarie rivers and several other tributaries of the Darling River. Inhabits a variety of habitat in streams, rivers, billabongs and swamps. Prefers slow-moving clear still waters

and often found congregating in small schools around dense aquatic vegetation, or submerged logs and branches. Essentially carnivorous; feeds on aquatic invertebrates and terrestrial arthropods which may fall onto the water surface and is also known to consume algae.

## Olive perchlet

*Ambassis agassizii*

Maximum fish length 8cm

Natural range includes tributaries of the Murray-Darling River system, coastal drainages of northern NSW. Habitats include vegetated margins of slow-flowing, warm waters in rivers, creeks, ponds, reservoirs, drainage ditches and swamps. May occur locally in large numbers,

congregating among aquatic vegetation in backwaters. Nocturnal feeder preying largely on micro-crustaceans, insects, small arachnids, algae and very small fish.

\*Only applies to fish found west of the Great Dividing Range

**Ornate rainbowfish***Rhadinocentrus ornatus*

Maximum fish length 8cm

Restricted range in coastal drainages extending north from Coffs Harbour. Occupies sandy-bottom creeks, lakes and ponds or streams with low flows. Predominantly found in sandy, coastal 'wallum' areas in tannin-

stained waters, amongst the cover of submerged roots and woody debris. Omnivorous diet, feeds on insects and their aquatic larvae and algae. Has been known to survive water temperatures down to 8 °C. Popular aquarium fish.

**Oxleyan pygmy perch***Nannoperca oxleyana*

Maximum fish length 7.5cm

Endemic from south-eastern Qld to north-eastern NSW. Found in small lakes, small, slow-flowing streams and rivers with sandy bottoms and weedy or reedy margins. Favours clear, tannin-stained often acidic creeks in coastal 'wallum' country,

with plenty of shelter in the form of undercut, root-filled banks or dense aquatic vegetation. Mainly carnivorous, feeding on copepods, water fleas and aquatic insects as well as algae.

**Purple-spotted gudgeon***Mogurnda adspersa*

Maximum fish length 12cm

Formerly distributed throughout the lower to mid slopes of the Murray-Darling drainage system. Also found patchily in far north coast streams. Occupies a variety of environments including rivers, creeks and billabongs. Prefers quiet or slow-flowing reaches with shelter provided by submerged structures such as woody debris, vegetation

and rocks. Spawns in summer when females produce successive batches of 280-1300 elongate, transparent eggs that are deposited on rocks, logs or other solid debris. Feeds on a wide range of organisms including tadpoles, worms and small fish but also known to consume algae, pollen and miscellaneous forms of organic matter.

**River blackfish***Gadopsis marmoratus*

Maximum fish length 35cm

Range restricted to altitudes above 150 metres in the Murray-Darling system. Inhabits a variety of environments from small streams, and fast-flowing rivers, to murky, slow-moving streams and dams. Prefers habitat with abundant cover provided by woody debris, aquatic macrophytes and

undercut banks. Spawns from spring to early summer, lays adhesive yellow-orange eggs in hollow logs or rock crevices. Secretive, bottom-dwelling fish. It consumes a significant amount of terrestrial invertebrates and also eats crustaceans, molluscs and small fishes.

\*Only applies to fish found in the Snowy River

**Sea mullet***Mugil cephalus*

Maximum fish length 75cm

Occurs around the entire mainland coast of Australia and northern Tasmania in large roving shoals. Primarily found in marine waters but commonly found in estuaries, brackish coastal lakes and lower freshwater reaches of rivers.

Undertakes spawning migrations out to sea. Timing of the run varies with latitude, tending to leave estuaries during periods of prevailing offshore winds. Forms an important component of the commercial fishing industry.

**Short-finned eel***Anguilla australis*

Maximum fish length 110cm

Found in freshwater lakes, swamps, and streams of temperate south-eastern coastal drainages. Final life cycle stage spent at sea on a spawning run, possibly triggered by phases of the moon, water temperature and water level rise. Juvenile glass eels then migrate back upstream. Becomes dormant

if temperatures fall below 10 °C, burying into the soft creek bed. Known to move overland through damp grass to find other streams. Juveniles are also able to climb damp vertical walls. Nocturnal, opportunistic carnivore, with a diverse diet of aquatic organisms.



## Short-headed lamprey

*Mordacia mordax*

Maximum fish length 44cm

Relatively common in streams, estuaries and coastal seas between the Hawkesbury and Gawler Rivers. Has also penetrated far inland in the Murray River. Adulthood spent at sea or in estuaries where they

suck the blood of fish. Undertakes upstream spawning migrations in fast-flowing section of rivers. Moves mainly at night. Spends around 3 years in its filter-feeding larval stage.



## Silver perch

*Bidyanus bidyanus*

Maximum fish length 50cm

Natural distribution covers most of the Murray-Darling River system, excluding the cool, upper reaches. Also found in several eastern coastal river systems. Inhabits warm, sluggish, standing waters such as nutrient rich floodplains, with cover provided by woody

debris and vegetation. It is also found in fast-flowing, turbid waters. Increased water flows and temperatures (over 23°C) trigger long upstream spawning migrations. Omnivorous diet. Adults and juveniles feed on insects, molluscs, worms and algae.



## Southern blue-eye

*Pseudomugil signifer*

Maximum fish length 8.8cm

Shoal-forming species found in the majority of the east coast drainages of Australia. Named for the brilliant blue ring surrounding its eye. Habitat can vary widely from brackish coastal waters in mangrove-lined creeks to pure fresh water

in clear forest streams. During breeding the males greatly enhance their ornate patterns, and erect their ornate fins in a display of courtship. Primarily consume insect larvae and micro-crustaceans.



## Southern pygmy perch

*Nannoperca australis*

Maximum fish length 8.5cm

A wide natural range, incorporating most of the lower reaches of the Murrumbidgee and Murray River systems. Inhabits weedy, slow-flowing or calm waters, lakes, shallow wetlands and irrigation channels. Prefers areas with cover provided by

overhanging riparian vegetation and aquatic plants. Spawns in response to rising water temperatures. Males become territorial, and display more vivid colouration to attract a mate. Diet includes small crustaceans, insects and larvae.



## Spangled perch

*Leiopotherapon unicolor*

Maximum fish length 25cm

One of the most widespread native freshwater fish, particularly in the warmer reaches of the Murray-Darling River system and temperate rivers of the far north coast. Occupies a range of water bodies, including main river channels, sandy lowland creeks and man-made lakes. Adults have remarkably good

dispersal abilities, recorded travelling up to 16 km in 2 hours along wheel ruts during thunderstorms! Upstream spawning migrations triggered by summer floods and temperatures exceeding 26 °C. Opportunistic omnivore; feeds on small aquatic insects, crustaceans, algae and molluscs.



## Striped gudgeon

*Gobiomorphus australis*

Maximum fish length 17.5cm

Found in most southeast coastal drainages but is more common at low elevations. Usually in muddy waterholes and slow-moving creeks, generally near submerged rocks, logs and vegetation. Juveniles are commonly found in estuaries as a

result of the newly hatched larvae being swept downstream, migrating back upstream later in life. Adults consume aquatic insects and the pest species *Gambusia holbrooki* (mosquitofish).



## Trout cod

*Maccullochella macquariensis*

Maximum fish length 85cm

Once widespread in the upper reaches of the Murray-Darling River system. Now found in the Murray River, where there's different substrate among in-stream cover of woody debris and in Seven Creeks area in narrow streams with rock, gravel and sand substrates and

as in pools mixed with rapids and cascades. Woody debris provides important habitat and a place for spawning. Inclined to remain at one site and have small home ranges. Carnivorous diet; feeding mainly on other fish, crustaceans, aquatic insects and molluscs.

## Two-spined blackfish

*Gadopsis bispinosus*

Maximum fish length 32cm

A usually solitary, bottom-dwelling, nocturnally active fish confined to a fairly small area on the southern slopes of the Great Dividing Range, in the upper reaches of the Murray River system. Inhabits cool, clear upland streams with in-stream cover, such as boulders, gravel or

cobbles. Also found in forested catchments with low sedimentation from soil erosion. Juveniles often form large groups among leaf litter and wood debris. Feeds on terrestrial invertebrates and aquatic insect larvae.

Un-specked hardyhead *Craterocephalus stercusmuscarum fulvus*

Maximum fish length 7.8cm

A shoal-forming species widespread throughout the Murray-Darling Basin, but most common in the Murray River. Often found in calm or gently-flowing lowland rivers, small streams, lakes, ponds and billabongs. Generally observed in the margins of shallow

water, amongst aquatic vegetation and over sand, gravel or mud substrate. Spawning occurs when temperatures exceed 24 °C. Adhesive eggs are laid over rocks, crevices and aquatic plants. Diet consists of small invertebrates and algae.

## Introduced Fish

## Brown trout

*Salmo trutta*

Maximum fish length 90cm

Popular freshwater angling fish, native to the northern hemisphere. First stocked in Australian waterways in the 1860s. Wide distribution throughout cooler waters, west of the Great Dividing Range, due to stocking and migration. Generally found in fast flowing streams and clear lakes.

Undertakes upstream spawning migrations in winter. Spawning occurs over gravel substrates; the fertilised eggs settle in depressions in the gravel, which are then covered in gravel by the female. Diet consists of aquatic and terrestrial insects, molluscs, small fishes and crustaceans.

## Common carp

*Cyprinus carpio*

Maximum fish length 120cm

Native to Asia, first introduced into Australia in the mid 1800s and undertook rapid colonisation, especially throughout inland catchments during the 1970s. Commonly associated with disturbed habitat, slow-flowing or stagnant waters, with abundant aquatic vegetation. Actively and successfully

competes with native fish for food, habitat and breeding sites. Prolific breeders; large, mature females can produce up to 1.5 million eggs. Diverse diet of molluscs, seeds, crustaceans, plant matter or detritus sucked from the bottom. Considered a 'noxious' species in NSW.

## Gambusia

*Gambusia holbrooki*

Maximum fish length 6cm

Native to North and Central America. It was introduced as an aquarium fish and then into natural waterways as a biological control for mosquito populations (which was proven ineffective). Prefers warm, slow-flowing waters. High reproductive rate;

females give birth to live young several times a year, producing 50-300 young at a time. An aggressive fish, known to prey upon the eggs and juveniles of native fish and frog species.

\*Class 1 noxious species, except in the Greater Sydney Region where it is Class 3.

**Goldfish***Carassius auratus*

Maximum fish length 40cm

Popular ornamental aquarium fish, native to eastern Asia. Introduced into Australia in the 1860s and subsequently released into the natural environment through carelessness and its use as live bait. Now widespread throughout most NSW catchments. Generally found

in slow-flowing waters, can tolerate high temperatures, high turbidity, and low oxygen concentrations. Competes actively with native fish for food and habitat. Diet includes plant matter, organic material and small crustaceans.

**Oriental weatherloach***Misgurnus anguillicaudatus*

Maximum fish length 25cm

Native to Asia and Europe. Introduced into Australia as an aquarium fish. Thoughtless release into waterways, escapes from ornamental ponds and live bait have resulted in a well established wild population. Highly invasive,

can tolerate a wide range of temperatures, salinity and oxygen levels. Can breathe air if needed and travel overland to colonise new waterways. Competes with native fish for food and habitat, and potentially feeds on native fish eggs.

**Rainbow trout***Oncorhynchus mykiss*

Maximum fish length 77.5cm

Native to coastal drainages of western North America and eastern Siberia. First introduced into Australia in the 1890s for recreational angling from New Zealand derived stock. Generally prefers cool, clear, lake habitat, also found in fast flowing rivers and streams with gravel substrates.

Upstream spawning migrations undertaken in winter to suitable gravel substrate sites, where fertilised eggs are protected and covered in gravel mounds to mature. Broad diet consists of aquatic and terrestrial insects, molluscs, crustaceans and small fishes. Popular aquaculture fish.

**Redfin perch***Perca fluviatilis*

Maximum fish length 45cm

Native to Europe, released into Australian waterways in the mid 1800s as an angling species. Prefers cooler, still, or slow-flowing waters with abundant aquatic vegetation. Extremely productive fish; spawning occurs in spring when females lay thousands of eggs in long gelatinous ribbons on logs and

vegetation. Diverse diet consisting of crustaceans, molluscs and small native fish species, including western carp gudgeon and juvenile Murray cod. Also carries the highly infectious viral disease EHN (epizootic haematopoietic necrosis), which is lethal to several native fish species.

## More information on listed species



Rules about threatened and protected species are complex and the species listed in these categories also change. For more details visit [www.dpi.nsw.gov.au/fisheries/species-protection](http://www.dpi.nsw.gov.au/fisheries/species-protection) or contact your local Fisheries NSW office.



It's illegal to catch and keep any protected or threatened species, and any that are caught accidentally must be returned immediately to the water unharmed. To reduce harm to fish being returned to the water, follow these basic guidelines:

- Minimise the length of time the fish is out of the water.
- Handle fish carefully and support the weight of its body.
- Take care to revive fish upon release if they appear exhausted. If there is any water current, hold the fish facing towards the current until it starts to show signs of recovery.

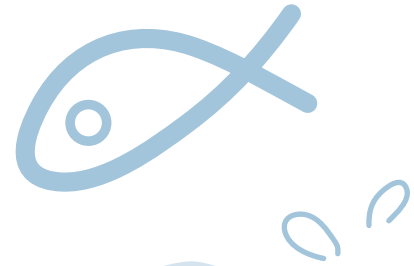


The Class 1 noxious listing prohibits sale and possession. Class 2 prohibits sale but allows possession in fully-contained aquaria. Class 3 allows sale and possession. It is strongly recommended that noxious species are not returned to the water.



# Glossary

- Amphipod:** small shrimp-like crustacean with a thin body. E.g. water flea.
- Benthic:** relating to the bottom of a water body (sea, lake or river).
- Brackish:** slightly salty, as a result of fresh and salt water mixing.
- Carnivorous:** feeding mainly on the flesh of other animals.
- Copepod:** tiny crustacean that lives among plankton and is an important food source for many fish.
- Crustacean:** freshwater or saltwater animal with no backbone (invertebrate), jointed legs and hard shell made of chitin. E.g. crab, lobster, crayfish, water flea.
- Detritus:** organic matter formed by the decomposition of animals and plants.
- Elongate:** narrow, the length is greater than the width.
- Endemic:** unique to a particular geographic region.
- Ephemeral:** short-lived waterway which flows after a high rainfall event.
- Invertebrate:** an animal without a backbone.
- Larvae:** an early life stage which still carries a yolk sac and differs greatly in appearance and behaviour than the adult form.
- Macrophyte:** a water plant large enough to be observed with the naked eye.
- Mollusc:** an invertebrate with a soft unsegmented body wholly or partly enclosed by a shell.
- Nocturnal:** active by night.
- Omnivorous:** eating both animal and plant foods.
- Pectoral:** found on either side of the body just behind the gill opening.
- Planktonic:** floating in the water column and carried by the currents.
- Riparian:** land which adjoins, directly influences, or is influenced by a body of water.
- Reach:** a stretch or portion of a river usually between bends.
- Spawn:** to release sex cells (eggs and sperm) directly into the water.
- Substrate:** non-living material serving as the waterway bed or basis upon which an organism lives or grows.
- Turbid:** muddied, cloudy, caused by suspended matter, usually sediments or the result of run-off.
- Venomous:** produces venom, extremely poisonous or injurious.
- Wallum:** Banksia dominated sandy coastal heath.
- Zooplankton:** tiny, usually microscopic animal, suspended or swimming in water.



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**Disclaimer:** The information contained in this publication is based on knowledge and understanding at the time of writing (April 2015). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser. The distribution maps are indicative of historical range of each fish species only. Users should note many of these ranges are now greatly contracted. They cannot be considered comprehensive and may contain errors and omissions. NSW DPI and its employees disclaim liability for any act done or omission made on the basis of the information in the map and any consequence of such acts or omissions.

To discover more about native fish species:

Allen, G.R., Midgley, S.H. & Allen, M. (2002). Field Guide to the Freshwater Fishes of Australia. Western Australian Museum, Perth.

McDowall, R.M., (1996). Freshwater fishes of south-eastern Australia. Reed Books, Sydney.



To learn more about the basic biology, distribution and conservation status of threatened and potentially threatened species of NSW:

Morris, S.A., Pollard, D.A., Gehrke, P.C. & Pogonoski, J.J. (2001). Threatened and Potentially Threatened Freshwater Fishes of Coastal New South Wales and the Murray-Darling Basin. NSW Fisheries, Sydney.



If you find a threatened or protected native fish on your property please report it to the NSW DPI protected and threatened species sighting program on 02 4916 3877.

If you would like to know how you can improve fish habitat and help our native fish species contact your nearest NSW DPI office or visit [www.dpi.nsw.gov.au/fisheries](http://www.dpi.nsw.gov.au/fisheries).

