

Aquatic Biodiversity in the Northern Rivers Region

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The aquatic habitat in the NRCMA area comprises freshwater, estuarine, and marine environments. From montane streams to lowland floodplain wetlands and coastal lagoons, the extensive range of aquatic habitats supports a diverse assemblage of fish species including the threatened Eastern freshwater cod (*Maccullochella ikei*) and Oxleyan pygmy perch (*Nannoperca oxleyana*) (see Table 1). The Northern Rivers also includes key estuarine species of conservation concern such as the threatened grey nurse shark (*Carcharias Taurus*), green sawfish (*Pristis zijsron*), and vulnerable black cod (*Epinephelus daemeli*). Moreover, the region supports an array of aquatic macroinvertebrates including insects, prawns, crayfish, and freshwater mussels. Over 100 species of frogs are found in the region (including the threatened Green and golden bell frog – *Litoria aurea*, Booroolong frog – *Litoria booroolongensis*, Giant barred frog – *Mixophes iterates*, and Red-crowned toadlet – *Pseudophryne australis*, as well as three chelonians (Eastern snake-necked turtle – *Chelodina longicollis*, Saw-shelled turtle – *Eseya latisternum*, and Macquarie turtle – *Emydura macquarii*). In addition, platypus (*Ornithorhynchus anatinus*) and water rats (*Hydromys chrysogaster*) – both mammals specialised for freshwater aquatic habitats – are found in North Coast waterways.

All these aquatic species are dependent on healthy streams and access to diverse habitats for their survival. Freshwater fish habitat in the Northern Rivers encompasses swamps, floodplains, wetlands, streams and major rivers. These broad habitat types provide niche habitats such as deep pools and shallow riffles, gravel beds, boulders, snags (large woody debris), aquatic vegetation, riparian vegetation and riparian overhangs and bank undercuts.

Healthy freshwater habitats in the Northern Rivers region are essential for conserving aquatic biodiversity. Of the 204 subcatchments identified in the North Coast Stressed Rivers Assessment (DLWC, 1999a&1999b), 33 were defined as High Conservation Value (HCV) including Cudgen Lake and Mooball Creek in the Tweed catchment; Belongil Creek, Lower Marshalls Creek and Simpsons Creek in the Brunswick catchment; 11 subcatchments of the Richmond system; Clarence River subcatchments including the Boyd, Nymboida, Sandon and Mann Rivers; Coastal Nambucca; Lower Deep Creek; Toorumbie Creek; Coastal Hastings; Ellenborough River; and Forbes River. However, more than 50% of the subcatchments assessed in the region were identified as having high environmental stress, including 22 of the HCV subcatchments.

Wetlands, both fresh and saltwater, provide specialised habitat for fish and aquatic invertebrates, as well as other fauna such as waterbirds, frogs and reptiles. Land-based pressures including urban development, stormwater runoff, grazing pressure and introduced pest species, can deleteriously impact wetlands. As a result, key wetland complexes in the NRCMA have been listed as SEPP 14 wetlands to minimise the impact of such pressures. SEPP 14 listings in the three subregions include (Northern Rivers) Cudgen Lake in the Tweed catchment; (Upper North Coast) the dunal wetland system of Bundjalung National Park, estuarine wetlands (seagrasses, mangroves and alluvial islands) in the Clarence River estuary and The Broadwater, Everlasting Swamp on the Clarence floodplain, freshwater lake habitats in Yuraygir National Park; (Mid North Coast) Limeburners Creek Nature Reserve, and Swan Pool-Belmore Swamp in the Lower Macleay Catchment. Additionally, higher altitude swamps and lagoons such as Round Mountain Swamp (near Ebor) and the RAMSAR-listed Little Llangothlin Lagoon provide niche habitat for a range of

Table 1: Freshwater and estuarine fish in the North Coast NSW

Scientific Name	Common Names	Status	Migration ¹ and habitat
<i>Acanthopagrus australis</i>	Yellowfin bream Silver bream	Common	Amphidromous; coastal marine; estuaries and inshore reefs
<i>Afurcagobius tamarensis</i>	Tamar River goby	Common	Estuaries, coastal lakes and lower freshwater river reaches
<i>Ambassis agassizii</i>	Olive perchlet	Threatened species - Endangered western population	Local migration; freshwater streams, ponds and swamps
<i>Ambassis marianus</i>	Estuary perchlet Glass perchlet	Common	Local migration; brackish mangrove estuaries and tidal creeks
<i>Amniataba percooides</i>	Banded grunter	Exotic; Noxious listing, NSW	Freshwater habitats
<i>Anguilla australis</i>	Short-finned eel	Common	Catadromous; coastal rivers & wetlands
<i>Anguilla reinhardtii</i>	Long-finned eel Marbled eel	Common	Catadromous; coastal rivers
<i>Annoya bifrenatus</i>	Bridled goby	Common	Estuaries and marine waters
<i>Arius graeffei</i>	Freshwater fork-tailed catfish	Common	Anadromous; northern coastal rivers
<i>Arrhamphus sclerolepis</i>	Snub-nosed garfish	Common	coastal bays and brackish estuaries
<i>Atherinosoma microstoma</i>	Smallmouthed hardyhead	Common	Unknown migration pattern; coastal estuarine and fresh waters
<i>Butis butis</i>	Bony-snouted gudgeon	Reasonably abundant in range	Brackish waters and coastal rivers
<i>Carassius auratus</i>	Goldfish	Exotic	Widespread in lowland rivers
<i>Chanos chanos</i>	Milkfish	Common	Marine and warm water, shallow estuaries and rivers
<i>Craterocephalus marjoriae</i>	Marjorie's hardyhead	Uncertain	Unknown migration pattern; found in abundance in fresh waters of the Clarence & Mary Rivers – few elsewhere.
<i>Cyprinus carpio</i>	Common carp	Exotic; Noxious listing	Still gentle flowing rivers in inland NSW and some catchments along the coast.
<i>Epinephelus coioides</i>	Estuary cod Rock cod	Protected	Marine – found mainly in reefy inshore waters and estuaries
<i>Gambusia holbrooki</i>	Gambusia	Exotic Noxious listing	Widespread in coastal and inland NSW
<i>Galaxias maculatus</i>	Common jollytail	Common	Catadromous; coastal streams, lakes and lagoons – salt and fresh water environs

¹ Migration patterns of freshwater fish include: *Potamodromous* – fish that migrate wholly within fresh water; *Anadromous* – fish that spend most of their life in the sea and migrate to fresh water to breed; *Catadromous* - fish that spend most of their life in fresh water and migrate to the sea to breed; *Amphidromous* - fish that migrate between sea and fresh water, but not for the purpose of breeding.

<i>Galaxias olidus</i>	Mountain galaxias	Common	Local migration; moderate and high elevations in coastal and inland rivers.
<i>Gerres subfasciatus</i>	Silver biddy	Common	Marine estuaries and bays, brackish coastal rivers and lakes.
<i>Glossamia aprion</i>	Mouth almighty	Abundant within its range	Local migration; northern freshwater streams, ponds and reservoirs
<i>Gobiomorphus australis</i>	Striped gudgeon	Common	Amphidromous; coastal streams generally at lower elevations.
<i>Gobiomorphus coxii</i>	Cox's gudgeon	Common	Potamodromous; coastal rivers from the Richmond River south.
<i>Gobiopterus semivestitus</i>	Glass goby	Uncertain	Estuarine
<i>Hypseleotris compressa</i>	Empire gudgeon	Common throughout its range	Unknown migration; lower reaches of coastal rivers.
<i>Hypseleotris galii</i>	Firetailed gudgeon	Common	Potamodromous; freshwater reaches of coastal streams.
<i>Hypseleotris klunzingeri</i>	Western carp gudgeon	Common	Unknown migration; inland and north coast streams
<i>Leiopotherapon unicolor</i>	Spangled perch	Common	Potamodromous; warm fresh waters in inland and north coast streams, backwaters and dams.
<i>Liza argentea</i>	Flat-tail mullet	Common	Estuaries and sea beaches
<i>Maccullochella ikei</i>	Eastern freshwater cod	Threatened Species – Endangered	Unknown migration; restricted to the Clarence and Richmond catchments
<i>Macquaria colonorum</i>	Estuary perch	Uncertain	Amphidromous; estuarine areas in coastal rivers and lakes
<i>Macquaria novemaculeata</i>	Australian bass	Uncertain	Catadromous; Coastal rivers up to 600m altitude.
<i>Megalops cyprinoides</i>	Oxeye herring	Abundant throughout its range	Amphidromous; tropical waters, estuaries and northern coastal fresh waters
<i>Melanotaenia duboulayi</i>	Duboulay's rainbowfish	Relatively common throughout its range	Local migration; coastal waterways from Macleay River north into QLD
<i>Mogurnda adspersa</i>	Purple-spotted gudgeon	Threatened Species listing - Endangered western population	Local migration; inland NSW and coastal streams of northern NSW and QLD
<i>Mugil cephalus</i>	Striped mullet Sea mullet	Common	Amphidromous; lower reaches and estuaries of coastal catchments
<i>Myxus elongatus</i>	Sand mullet	Common	Amphidromous as juveniles; estuaries and brackish waters in lower river reaches
<i>Myxus petardi</i>	Freshwater mullet	Common	Catadromous; freshwater reaches of coastal rivers north of Georges River into QLD
<i>Nannoperca oxleyana</i>	Oxleyan pygmy perch	Threatened Species – Endangered	Local migration; some northern streams and swampy areas.
<i>Notesthes robusta</i>	Bullrout	Limited abundance but not threatened	Catadromous; tidal estuaries and fresh waters
<i>Oncorhynchus mykiss</i>	Rainbow trout	Exotic	Local migration; montane regions along the Great Dividing Range
<i>Philypnodon grandiceps</i>	Flathead gudgeon	Common	Unknown migration; inland and coastal waters especially lakes and dams

<i>Philypnodon</i> sp.1	Dwarf flathead gudgeon	Common	Unknown migration; coastal and inland streams
<i>Platycephalus</i> <i>fuscus</i>	Dusky flathead	Common	Amphidromous; marine and estuarine waters
<i>Potamalosa</i> <i>richmondia</i>	Freshwater herring	Not common but not considered under threat	Catadromous; estuaries and coastal fresh water rivers
<i>Pseudomugil</i> <i>signifer</i>	Southern blue- eye	Common	Amphidromous; eastern draining catchments
<i>Redigobius</i> <i>macrostoma</i>	Largemouth goby	Common	Amphidromous; estuaries, coastal rivers and some freshwater streams
<i>Retropinna</i> <i>semoni</i>	Australian smelt	Common	Potamodromous; Inland and coastal freshwater
<i>Rhadinocentrus</i> <i>ornatus</i>	Softspined rainbowfish	Patchy localised distribution	Local migration; northern coastal streams
<i>Tandanus</i> <i>tandanus</i>	Freshwater catfish	Common	Local migration; lakes and slow-flowing rivers
<i>Valamugil</i> <i>georgii</i>	Fantail mullet	Common	Amphidromous as juveniles; marine and estuarine waters

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