



Policy for fish stocking in Queensland

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Contents

- 1 Purpose 5
- 2 Scope 5
- 3 Definitions 6
- 4 Background and context 6
- 5 Relevant legislation and policy 7
 - Fisheries legislation 7
 - Biosecurity legislation 8
 - Other legislation and policies 9
- 6 Key guiding principles 10
- 7 Types of fish stocking 11
 - 7.1 Recreational fishing 12
 - 7.2 Conservation 13
 - 7.3 Ecosystem restoration 14
 - 7.4 Mosquito control 14
 - 7.5 Pest fish control 14
 - 7.6 Commercial fisheries enhancement 14
- 8 Risks 14
 - 8.1 Ecological impacts 14
 - 8.2 Genetic implications 15
 - 8.3 Disease 16
 - 8.4 Pest and weed translocation 16
- 9 Risk-based assessment process 16
 - 9.1 General requirements 16
 - 9.2 New public impoundment 25
 - 9.3 New river/waterway 25
 - 9.4 New species or genetic strain to an existing stocking program 26
 - 9.5 Mosquito control in fresh waters 26
 - 9.6 Decision-making 27
- 10 Responsibilities 27
- 11 References 27
 - Legislation 28
 - Useful resources 28
- Appendix 1: Fish species and catchments suitable for stocking 29
 - Australian bass 29
 - Barramundi 31
 - Eel-tailed catfish 39
 - Golden perch 42

| | |
|---|----|
| Mary River cod..... | 46 |
| Murray cod | 48 |
| Northern saratoga | 50 |
| Redclaw crayfish..... | 51 |
| Silver perch | 53 |
| Sleepy cod | 55 |
| Snubnose garfish | 57 |
| Sooty grunter | 58 |
| Southern saratoga | 60 |
| Appendix 2: New fish species considered for trial stocking | 62 |
| Jungle perch | 62 |
| Mangrove jack..... | 63 |
| Sea mullet | 64 |
| Appendix 3: Prohibited stocking of public waters for recreational fishing | 65 |
| Appendix 4: Prohibited translocations of non-indigenous fish..... | 66 |
| Appendix 5: Fish movement information | 67 |
| Appendix 6: Risk assessment matrix | 69 |

1 Purpose

The purpose of this policy is to effectively manage fish stocking in Queensland to improve the success of fish stocking and minimise the impacts on the environment. To ensure the success and benefits of stocking are not outweighed by damage to the receiving environment, a responsible approach has been adopted to develop, manage and evaluate fish stocking in Queensland. This document will:

- describe the **types** of fish stocking and objectives
- outline the **process** for managing (including adaptive management and ongoing improvements) and evaluating fish stocking in Queensland
- provide guidance on the **requirements** for fish stocking in Queensland waters.

2 Scope

This document applies to all private or public fish stocking in Queensland waters, fish stocking groups, recreational fishers, government agencies, other statutory bodies, private land owners and the public.

This document does not apply to:

- general rules associated with recreational fishing in Queensland (refer to the *Fisheries Act 1994* (Fisheries Act) and associated legislation)
- approvals to stock farms for aquaculture production (development approval under the *Planning Act 2016* (Planning Act))
- aquaculture approvals for hatcheries (development approval under the Planning Act)
- broodstock collection approvals for hatcheries (general fisheries permit under the Fisheries Act)
- the stocking of fish species listed under the *Nature Conservation Act 1992* (Nature Conservation Act) (these species are not considered fish under the Fisheries Act)
- promotion, advertising or other communications by the government regarding stocking activities (this is addressed as part of Fisheries Queensland's overall communications plans)
- the management and scope of the Stocked Impoundment Permit Scheme (SIPS) (refer to the SIPS guidelines).

3 Definitions

| | |
|--------------------------|--|
| Aquaculture | Cultivation of live fisheries resources for sale, other than in circumstances prescribed in a regulation |
| Fish stocking | Release of fish into waters to maintain or create a population of fish |
| Fresh water | Water not influenced by tidal reaches |
| Hatchery | Includes both dedicated hatcheries and grow-out facilities which supply fish for stocking |
| Impoundment | Enclosed waterbody formed by a weir or dam |
| Licensed hatchery | Refers to aquaculture facilities which have a development approval under the Planning Act |
| Private waters | External structures on private land (e.g. farm dams) unable to sufficiently prevent escape during flooding or overtopping (does not include indoor tanks or aquaria) |
| SIPS | Stocked Impoundment Permit Scheme |
| Translocation | Introduction of fish or distinct genetic stocks of fish to areas outside their natural distribution |
| Waterway | Waterbody not impounded by a weir or dam (including rivers) |

4 Background and context

The *Queensland Sustainable Fisheries Strategy 2017–2027* sets out the Queensland Government's reform agenda for the next 10 years. The overall vision is:

A modern, responsive and consultative approach to fisheries management ensures fishing is a low risk to Queensland's aquatic resources, and these are used in a way that optimises benefits to the community.

Effective management of stocked fisheries resources depends on appropriate legislation, policies, compliance, communication, stocking group partnerships, hatchery production of fingerlings and periodic review of management.

Stocking is a use of fisheries resources that, if managed appropriately, aligns with the purposes of the Fisheries Act in terms of providing benefits to the wider community while minimising environmental risks. It also supports the priorities of Queensland's 'Our Future State' plan to advance Queensland. More than 50 million fish have been stocked into freshwater dams, weirs, rivers and creeks throughout Queensland since 1974. Stocking activities have evolved and expanded into sophisticated operations that focus on the best management and use of the state's freshwater fisheries resources. Fish stocking can provide great environmental, social, cultural, and economic benefits, including:

- industry development (such as tourism and recreational fishing)
- employment (e.g. for charter operators, bait and tackle shops, caravan parks etc.)
- investment incentives for hatcheries and associated infrastructure
- contribution to social and cultural values from fishing, food and voluntary activities.

Stocking also provides significant economic benefits to the state. A 2013 study, *An economic assessment of the value of recreational angling at Queensland dams involved in the Stocked Impoundment Permit Scheme* (Gregg and Rolfe 2013), indicated that the return to regional economies was \$100 million

annually using the travel–cost method of estimation (this excludes sales of boats, tackle and gear).

Historically, fish stocked into waterways were caught as juveniles and adults and moved between waterways. When mass stocking of fish first began in 1974, fingerlings were sourced from the Queensland Government and from hatcheries in New South Wales. This continued until hatcheries in Queensland became established and were able to fulfil orders for fingerlings.

The position paper *Freshwater stocking in Queensland* (Moore 2007) was released in 2007 by the Queensland Government for use in the development of future ecologically sustainable management practices. That position paper is superseded by this policy.

An ecological risk assessment completed in 2012 informed most of the current management arrangements and the guidelines in this policy.

The development of a fish stocking policy for all waters in Queensland, including tidal waters, was a key action item from the 2018 Freshwater Fishing and Fish Stocking Workshop held at Warwick. This meeting also highlighted the need to continue to investigate new species for stocking, with jungle perch, mangrove jack and sea mullet identified as species that had the most advanced research and development.

5 Relevant legislation and policy

Fish stocking in Queensland waters is subject to the requirements of the Fisheries Act and associated regulations and declarations.

Fisheries legislation

Fisheries Act 1994

The main purpose of the Fisheries Act is to provide for the use, conservation and enhancement of the community's fisheries resources and fish habitats in a way that seeks to apply and balance the principles of ecologically sustainable development, and promote ecologically sustainable development. Each principle is given the relative emphasis appropriate in the circumstances, having regard to ensuring access to the fisheries resources is allocated in a way that maximises the potential economic, social and cultural benefits to the community.

Under the Fisheries Act, a person must not unlawfully release non-indigenous fisheries resources (section 90) or aquaculture fisheries resources (section 91) into Queensland waters.

Fisheries (General) Regulation 2019

Relevant sections include:

- section 25(c)—the chief executive may issue stocked impoundment permits
- section 25(e)—the chief executive may issue a general fisheries permit
- section 28—only particular authorities may authorise particular activities (the release of aquaculture fisheries resources into Queensland waters requires a general fisheries permit)
- section 55—stocked impoundment permit (a person who holds a stocked impoundment permit may take freshwater fish using a fishing line from a prescribed stocked impoundment)
- section 57—general fisheries permit for release of non-indigenous fisheries resources into non-tidal waters (it is a condition of the permit that a person acting under the permit must not release the fisheries resources into the waters of the river basins mentioned in schedule 10B)
- section 98—circumstances in which non-indigenous fisheries resources may be released (in section 90(2) of the Fisheries Act, the release or placing of non-indigenous fisheries resources of a species

mentioned in schedule 4, part 2, column 2, taken in the waters mentioned opposite the species in column 1 into those waters, is prescribed)

- schedule 1—releasing aquaculture fisheries resources is a prescribed act (releasing aquaculture fisheries resources into Queensland waters other than in the following circumstances—authorised under the Planning Act, or the release into private non-tidal waters of fisheries resources that are indigenous fisheries resources for the waters, or the release of fisheries resources mentioned in schedule 1, section 20, column 2 (table for release of aquaculture fisheries resources without an authority) into private non-tidal waters in the river basin mentioned opposite the resources in schedule 1, section 20, column 1)
- schedule 1—placement of fisheries resources cultivated other than for sale is a prescribed act; placing fisheries resources cultivated other than for sale, whether taken in or outside Queensland, in an area in Queensland; a person who has authority to do prescribed act is a person who holds an authority authorising the placement of the fisheries resources in the area
- schedule 1, section 20—an adult may take a freshwater fish from a prescribed stocked impoundment using a fishing line only if the person holds a stocked impoundment permit or general fisheries permit authorising the person to take the freshwater fish from the prescribed stocked impoundment using a fishing line
- schedule 1—river basins where aquaculture fisheries resources can be released
- schedule 2—river basins where non-indigenous fisheries resources cannot be released (restriction on stocking non-indigenous fish)
- schedule 4, part 2—release of non-indigenous fisheries resources
- schedule 6, part 3—fees for stocked impoundment permits
- schedule 7, part 3—particular non-indigenous fish
- schedule 8, part 3, section 18—meaning of prescribed stocked impoundment.

Fisheries Declaration 2019

Relevant sections include:

- chapter 2—regulated waters declarations
- schedule 2—cannot use redclaw and yabby as live bait in non-tidal waters other than the river basins mentioned in schedule 3
- schedule 3—river basins where particular fish can be used as live bait
- chapter 3—regulated fish declarations
- chapter 4—regulated fishing apparatus declarations
- chapter 5—regulated fishing method declarations.

Biosecurity legislation

Biosecurity Act 2014

All Queenslanders have a ‘general biosecurity obligation’ under Queensland’s *Biosecurity Act 2014* (Biosecurity Act). This means that everyone is responsible for managing biosecurity risks that are under their control and that they know about, or should reasonably be expected to know about.

A biosecurity risk is the risk that exists when you deal with any pest, disease or contaminant, or

something that could carry a pest, disease or contaminant (e.g. animals, plants, soil, equipment—known as ‘carriers’).

Under the general biosecurity obligation, individuals and organisations (including stocking groups and hatcheries) whose activities pose a biosecurity risk must:

- take all reasonable and practical steps to prevent or minimise each biosecurity risk
- minimise the likelihood of causing a ‘biosecurity event’, and limit the consequences if such an event is caused
- prevent or minimise the harmful effects a risk could have, and not do anything that might make any harmful effects worse.

Other legislation and policies

Nature Conservation Act 1992

- Protection of Queensland biota.
- Live animals (including fish) must not be taken into a protected area. Protected areas include national parks (scientific, Aboriginal land or Torres Strait Islander land), conservation parks and resources reserves.
- The Nature Conservation (Wildlife) Regulation 2006 lists species that are classed as threatened or near threatened in Queensland. Threatened species are managed via protected areas, biodiversity offsets, nature refuges, protected plants, and vegetation management.
- Some fish species are protected under the Nature Conservation Act. These may not be stocked, even into private waters, without a permit under the Nature Conservation Act.

Environment Protection and Biodiversity Conservation Act 1999

- The Australian Government’s key piece of environmental legislation that provides a national scheme of environment and heritage protection and biodiversity conservation.
- While not formally identified as a key threatening process, stocking presents risks to the environment and to biodiversity. If risks associated with stocking are not managed effectively, there is the possibility of additional approvals being required under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

Wet Tropics World Heritage Protection and Management Act 1993

- Protection and management of the Wet Tropics of Queensland World Heritage Area. New stocking proposals within a wet tropics area may require a permit from the Wet Tropics Management Authority.
- The *Wet Tropics Management Plan 1998* (the Management Plan) is a regulation under the *Wet Tropics World Heritage Protection and Management Act 1993* and applies to the wet tropics area. The Management Plan prohibits new translocation of crustacean or fish without a permit.

State development assessment provisions guideline—State code 17: Aquaculture

- Provides guidance about aquaculture approvals under the Planning Act to ensure aquaculture industry development and practices are ecologically sustainable.

Broodstock and culture stock collection policy

- Provides information on the species most commonly collected as broodstock and culture stock in Queensland and highlights any legislative or policy constraints relevant to their capture from the wild.

Establishes assessment criteria for new permit applications, provides guidelines for setting reasonable and relevant conditions for approvals, and recommendations for the number of broodstock or culture stock that may be collected under an approval.

Health protocol for the movement of live freshwater native finfish (other than barramundi and eels): Aquaculture protocol FAMPR007 (2011)

- Protocols for the movement of freshwater fish within Queensland and from interstate—outlines management measures, legislation and health certifications required to minimise disease risks associated with translocation.

Health protocol for the important and movement of live barramundi: Aquaculture protocol FAMPR02 (2011)

- Protocols for the movement of barramundi within Queensland and from interstate—outlines management measures, legislation and health certifications required to minimise disease risks associated with translocation.

6 Key guiding principles

The following principles should be applied to fishing stocking proposals:

- The sustainability of Queensland's freshwater fisheries is paramount.
- The vision from the *Queensland Sustainable Fisheries Strategy: 2017–2027*—'A modern, responsive and consultative approach to fisheries management ensures fishing is a low risk to Queensland's aquatic resources, and these are used in a way that optimises benefits to the community'.
- Fish stocking in Queensland is undertaken in accordance with world's best practice.
- Fish stocking must minimise risks (genetic, disease, pest, ecological) to natural systems.
- The benefits (social, economic, environmental) outweigh the risks to public resources.
- Proposals to stock new waterways must include a demonstrated need to stock.
- There is a clear benefit to Queensland in terms of the best management, use, development and protection of fisheries resources.
- Interactions with threatened, endangered or protected species are managed.
- Management of stocking is proportionate to risks.
- Solutions are cost-effective and capable of being implemented.
- Decisions made before the implementation of this policy will not necessarily be considered justification for similar stocking requests in the future.

7 Types of fish stocking

There are several types of fish stocking undertaken in Queensland for varying purposes. Stocking in Queensland can be split into two broad categories—stocking of private waters and public waters (refer to Table 1).

Table 1: Stocking of private and public waters

| | Private waters | Public waters |
|----------------------|---|---|
| Definition | Private waters includes artificially created waters (such as dams, ponds, tanks etc.) on private land that are not connected to natural watercourses. Natural watercourses include rivers, creeks, streams, lagoons etc. | Public waters are all other waters of Queensland. |
| Objectives | Private waters are generally stocked for: <ul style="list-style-type: none"> • ecosystem restoration and/or enhancement • ornamental purposes • mosquito control • fish and crayfish for consumption • fish and crayfish for recreational fishing. | Public waters are stocked for: <ul style="list-style-type: none"> • recreational purposes: <ul style="list-style-type: none"> ○ to enhance wild freshwater fish stocks (e.g. stocking barramundi into freshwater rivers) ○ to create and maintain freshwater fisheries such as in dams and impoundments (e.g. put-grow-take fisheries) • conservation (e.g. Mary River cod stocked under a recovery plan) • ecosystem restoration and/or enhancement (e.g. stocking watercourses within urban developments with species native to the catchment) • fodder fish—stocking impoundments with food fish (e.g. bony bream for larger species) • pest fish control • mosquito control. |
| Authorisation | Can be undertaken by land owners without a general fisheries permit. | Requires a general fisheries permit (so as not to contravene sections 90 and 91 of the Fisheries Act). Must be accompanied by a fish stocking management plan. Approved general fisheries permits can be viewed on Fishnet Public. |
| Restrictions | Due to the risk of fish escaping during flood events, private waters may only be stocked with fish that: <ul style="list-style-type: none"> • are indigenous to the catchment (refer to Appendix 1) • are non-indigenous fish permitted under section 98 of the Fisheries (General) Regulation (prescribed in schedule 4, part 2) • are aquacultured fisheries resources permitted under schedule 1 of the Fisheries (General) Regulation. | As per conditions of general fisheries permit. |

| | Private waters | Public waters |
|------------------------|---|--|
| Source of stock | <p>Fish that can be released into private waters may be sourced from:</p> <ul style="list-style-type: none"> • licenced hatcheries • aquarium retailers* • wild fisheries (caught following recreational rules and regulations). <p>For more information on stocking private waters, visit fisheries.qld.gov.au.</p> <p>*only where the source of stock was from a licenced hatchery and dockets/receipts can validate this.</p> | <p>Fish cannot be released into public waters without authority if they are:</p> <ul style="list-style-type: none"> • non-indigenous (section 90 of the Fisheries Act, sections 57 and 98 of the Fisheries (General) Regulation) • aquacultured—i.e. cultured for sale (section 91 of the Fisheries Act, schedule 1 of the Fisheries (General) Regulation) • cultured other than for sale—e.g. donate (schedule 1 of the Fisheries (General) Regulation) • indigenous but from another waterway (schedule 1 of the Fisheries (General) Regulation). <p>General fisheries permit conditions require all fish to be sourced from a licenced hatchery approved under the Planning Act or under an appropriate quality assurance program.</p> <p>Any other situations require a separate general fisheries permit (e.g. stocking of southern saratoga from Fitzroy Dawson catchment into other eastern catchments via translocation).</p> <p>Under some circumstances stocking may occur from community stocking hatcheries. Although these hatcheries do not require a development approval, they are expected to meet the same requirements as commercial operations in regard to biosecurity risks and genetic risk management.</p> |

7.1 Recreational fishing

Fish stocking for the purpose of improving and maintaining recreational fishing is the main type of fish stocking undertaken in Queensland. It includes:

- **enhancement stocking** of fish into rivers, weirs and some dams to replenish wild fish stocks or increase existing stocks to enhance recreational fisheries
- stocking of fish into some dams and weirs as **put-grow-take** fisheries, where most native fish will not reproduce or recruit successfully
- stocking of **fodder fish** into some dams and weirs to provide a food source for predatory fish (e.g. bony bream).

Enhancement stocking

Enhancement stocking is carried out in public impoundments and riverine areas to enhance the wild population or so the fish can close the life cycle within the waterbody. The main aim of this stocking is to enhance recreational fishing opportunities. In some circumstances it may also help to restore the natural diversity of degraded and isolated riverine areas.

Examples of enhancement stocking include stocking barramundi into northern Queensland rivers, and stocking saratoga into southern Queensland impoundments to form self-sustaining populations.

Put-grow-take

Put-grow-take fisheries are created in impoundments where most native sportfish cannot breed or recruit—the fish cannot close the life cycle within the waterbody and need to be continually restocked. The primary purpose of impoundment stocking is to create or enhance recreational fishing opportunities, contributing to local recreational opportunities and tourist-related income. The main species used in southern Queensland are golden perch, silver perch, Australian bass and Murray cod, and barramundi and sooty grunter in northern Queensland.

Increasingly put-grow-take fisheries are also supporting significant catch and release activities. For example recent surveys of SIPS users have regularly reported catch and release rates of approximately 60%.

Fodder fish

Stocking of fodder fish to provide a food source for large predatory fish would generally not be supported. If a stocked fish species does not survive in a particular location due to the available food source, then this stocking would not be considered a success. In addition, fodder fish species are unlikely to be included on the list of approved stocking species.

7.2 Conservation

Fish stocking to help species recovery or limit population decline would only be carried out as part of a recovery program for listed species (endangered, vulnerable etc.) or new species that are identified as high risk for extinction or population decline by the responsible agency. This is the most specialised type of fish stocking, with close attention paid to the genetic diversity of stocked fingerlings. Conservation stocking is generally done in close consultation with relevant agencies such as the Department of Agriculture and Fisheries, the Department of Environment and Science, and the Department of Regional Development, Manufacturing and Water.

Mary River cod

Mary River cod have been stocked for conservation since the early 1980s. A recovery team was formed in 1995 and a recovery plan produced in 1996 (Simpson & Jackson 1996). One of the recommendations of the plan was a breeding and restocking program in areas within the species' current and former natural range. Mary River cod have also been stocked for conservation purposes into the Brisbane, Stanley, Logan-Albert and Coomera rivers, and to allow angling opportunities in the Hinze, Maroon, Moogerah, Wivenhoe, Somerset, Cressbrook, Wyaralong, and Ewen Maddock dams and lakes Dwyer and Samsonvale.

Other species

Other species that have been stocked to assist in recovery include:

- running river rainbowfish (*Melanotaenia* sp.) in the Running River
- Malanda rainbowfish (*Melanotaenia* sp.).

With the increased distribution of pest species and environmental concerns such as drought, conservation stocking may be considered in the future for species in low numbers in certain areas (e.g. Murray cod, silver perch and eel tailed catfish are extremely rare within the Warrego and Paroo Rivers and may require support in these catchments).

7.3 Ecosystem restoration

Ecosystem restoration is usually undertaken by housing developers and local governments to establish native fish communities within newly created or modified waterways—most often in private waters. It also has a positive effect on mosquito and pest fish control by re-establishing native fish communities.

7.4 Mosquito control

This activity is generally requested by local governments, housing developers and community groups. It may also be undertaken in private waters as an alternative to chemical controls. The stocking of small-bodied native fish can assist in the biological control of mosquitos. Some species of fish have been found to be very effective in controlling mosquito populations.

Fish that are native to local waterways help ensure that local ecosystems are not disturbed—these fish are also better suited to local conditions and are readily obtained. Common species used include glassfish, gudgeons, rainbowfish and blue-eyes.

7.5 Pest fish control

The stocking of native fish to control pest fish populations (such as tilapia and carp) would generally not be supported. Evidence from previous attempts suggest that the risks outweigh the benefits. Aside from predation on the pest fish, native species also compete with pest fish for resources.

7.6 Commercial fisheries enhancement

Stocking for commercial fisheries enhancement is not supported. Sustainability is the primary concern for management of commercial fisheries. If the biomass of a commercial fishery declines to a level that requires stocking to replenish numbers, that fishery would be closed according to the harvest strategy management approach.

8 Risks

Fish stocking may result in both benefits for, and impacts on, natural, social and economic environments.

Benefits are listed in section 4 of this policy and include the creation of fisheries that promote economic benefits such as tourism, tackle sales and accommodation, and social benefits such as satisfaction.

Potential negative impacts are described in sections 8.1, 8.2, 8.3 and 8.4, and these risk are managed through the approvals process outlined in section 9.

8.1 Ecological impacts

Fish stocking must be strictly controlled to avoid irreversible damage to native fish communities and species of conservation interest. Irresponsibly managed fish stocking may result in:

- habitat alterations, including water quality and displacement of aquatic vegetation
- trophic changes, such as predation and alterations of food webs, dietary overlap and competition for space
- changes to the spatial distribution of aquatic biota and disease, which may result in protected and/or species of conservation interest interactions due to habitat overlap, predation and competition
- genetic implications by reducing the fitness and resilience of the population, such as genetic diversity and hybridisation (including reduction and/or loss of genetic diversity and loss of genetic strains).

Species of conservation interest are considered to be all fauna that are deemed to be threatened or in

need of special protection. This not only includes fish but all other fauna. Stocked fish may also impact on fauna such as frogs, small mammals etc. These species are listed in the:

- EPBC Act
- Nature Conservation Act
- Fisheries Act
- International Union for Conservation of Nature Red List.

Unfortunately, several exotic species of fish have been released into Queensland waters. If these species establish, the consequences for native fish can be severe. Carp (*Cyprinus carpio*), tilapia (*Oreochromis mossambicus*, *Tilapia mariae*) and gambusia (*Gambusia spp.*) are some examples of species that have established large populations in some Queensland catchments.

Exotic species can establish quickly in waterways where they are introduced, which impacts on native species in the waterbody through competition for food and space, and stress-related conditions due to the aggressive nature of the introduced species.

8.2 Genetic implications

Fish stocking carries the risk of translocating fish or distinct genetic stocks of fish to areas outside their natural distribution. This may occur:

- between catchments—moved from a waterbody in one catchment to another waterbody in an adjoining catchment
- within catchments—barriers (such as waterfalls) prevent the natural distribution of a species throughout a catchment and moving fish from below to above such barriers is considered a translocation
- between genetic strains—a population or group of populations of a species that differ in their genetic makeup are usually separated geographically (e.g. it is considered a translocation if golden perch from the Murray–Darling strain are put into an area where the Lake Eyre strain occurs), genetic variability may be reduced by breeding fish for aquaculture, and reducing the genetic variability can impact a species' fitness for survival.

These types of translocation occur:

- if fish are released into public waters in a catchment where they are non-indigenous
- if fish escape from dams and weirs during a flood event
- during movement of biological matter.

To reduce these risks, restrictions are placed on areas and catchments where fish stocking can occur, and guidance is provided to ensure only appropriate fish are stocked (refer to section 9).

In addition, there is a risk of genetic variability loss by breeding fish for aquaculture if inappropriate animals and/or too few animals are used for broodstock. Reducing genetic variability can affect a species' fitness for survival. While this risk is largely managed by commercial aquaculture operations as part of their normal business, the *Broodstock and culture stock collection policy* recognises that ongoing broodstock collection is important for replenishment of viable spawning stock and maintenance of genetic diversity.

8.3 Disease

Disease issues arise with any fish stocking activity. Risks from disease can occur:

- if fingerlings are sourced from a hatchery that has inappropriate disease controls
- if fingerlings are stocked at inappropriate densities
- during movement of biological matter and unintended fish species.

To address this risk, fish to be stocked into public waters must be obtained from appropriate sources (refer to section 9). See section 5 for additional information about requirements under the Biosecurity Act.

8.4 Pest and weed translocation

In any stocking activity there is a risk of translocating pest or weed organisms, seeds or spores attached to the fish species.

To address this risk, fish to be stocked into public waters must be obtained from appropriate sources (refer to section 9). See section 5 for additional information about requirements under the Biosecurity Act.

9 Risk-based assessment process

9.1 General requirements

Process

1. A pre lodgement discussion between the applicant and Fisheries Queensland is undertaken regarding the fish stocking proposal. Fisheries Queensland will determine the risk category, which will determine the assessment criteria.
2. A general fisheries permit under the Fisheries Act is required for all new stocking activities or amendments to existing stocking activities. Visit business.qld.gov.au for more information and the general fisheries permit application form.
3. General fisheries permits should also include supporting documents addressing each of the assessment criteria (refer to Table 2), including a fish stocking management plan.

General fisheries permits cannot be renewed. When the permit expires a new application must be made, which will be assessed on its own merits. Performance reports from previous permits will be taken into consideration.

Higher risk activities

The following types of stocking are considered a **higher level of risk** and are subject to additional assessment criteria (refer to Table 2):

- addition of new species to a stocking program in a sensitive area (e.g. important ecological habitats, high number of species of conservation interest)
- trial stocking of a species listed in Appendix 2
- new stocking activities in public waterways (not new stocking activities in impoundments).

Assessment criteria

Applications for fish stocking must address the assessment criteria in Table 2. Applicants are responsible for completing the risk assessment to an acceptable standard. Assessment criteria with a tick are required for all applications. Activities considered a higher risk need to address the additional assessment criteria marked with a star.

Table 2: Assessment criteria

| Fish stocking assessment criteria | |
|-----------------------------------|--|
| ☑ | Applicant must be a stocking group or appropriate stocking organisation (e.g. council, water storage operator), not an individual |
| ☑ | Appropriate and achievable program goals |
| ☑ | Appropriate choice of receiving environment/waters |
| ☑ | Appropriate choice of species |
| ☑ | Appropriate source of fingerlings, including: <ul style="list-style-type: none"> • hatchery fingerlings must be from a hatchery approved under the Planning Act <u>or</u> operating under an appropriate quality assurance program • translocations must be approved by a separate general fisheries permit under the Fisheries Act |
| ☑ | Permission from the water storage operator (if a separate entity to the applicant) if the proposal is for recreational stocking |
| ☑ | Public access if the proposal is for recreational stocking |
| ☑ | A viable funding model |
| ☑ | A risk assessment must be undertaken for each stocking proposal, which demonstrates that the level of risk is acceptable |
| ★ | Higher risk proposals require comprehensive risk assessment of impacts—genetic impacts, impact to other flora and fauna |
| ☑ | A fish stocking management plan must be developed in conjunction with Fisheries Queensland for all public water stocking programs For conservation stocking, a recovery action plan or conservation action plan must be in place |
| ☑ | Objectives and milestones |
| ☑ | Details of proposed release sites, including any habitat improvements or fish attracting structures |
| ☑ | Full details of fish to be released—species, source etc. |
| ☑ | Stocking regime—stocking rates, numbers to be stocked, size of released fish, water levels, proposed sequence of stocking over the duration of permit, time of stocking, release methods, species composition and proportions of each type |
| ☑ | Monitoring and evaluation of the stocked species |
| ★ | Higher risk proposals will require more frequent review and engagement with Fisheries Queensland |
| ☑ | A monitoring, evaluation and improvement component |
| ☑ | Assess the project in terms of its stated objectives by using quantitative measures of success |
| ☑ | Use adaptive management to evaluate and improve management strategies and tactics |
| ★ | Higher risk proposals require a monitoring program (which may include surveys before and after stocking) to determine the impacts on the receiving environment (to the satisfaction of Fisheries Queensland) |
| ★ | Higher risk proposals require consultation with stakeholders in the development of a fish stocking management plan. At a minimum, this should include: <ul style="list-style-type: none"> • the Freshwater Fishing and Stocking Association of Queensland Inc. as the representative body for the sector • advisory groups such as the SIPS working group • appropriate government agencies • relevant organisations and sectors of the community |

| Fish stocking assessment criteria | |
|-------------------------------------|--|
| | May also require a letter of comment or permit from relevant authorities such as the Commonwealth Department of Environment and the Wet Tropics Management Authority |
| <input checked="" type="checkbox"/> | Ability to comply with standard monitoring and auditing requirements |
| <input checked="" type="checkbox"/> | Completing an annual report |
| <input checked="" type="checkbox"/> | Auditing requirements as per Stocked Impoundment Permit Scheme approvals |

Stocking groups

The applicant must be a **fish stocking group** or appropriate organisation (e.g. council, water storage operator).

Stocking of public waterways is a significant responsibility because it can potentially impact upon shared, publically owned resources. For this reason it is inappropriate for individuals to hold stocking approvals.

A fish stocking group is defined as an incorporated not-for-profit group that consists of volunteers from the public. Groups should maintain appropriate insurances, accreditations and other approvals as required for good governance and performance. Roles include:

- undertaking risk assessments and, where appropriate, developing contingency plans to cope with incidents (such as fish going over dam walls, fish salvage) and obtaining relevant permits
- organising funding arrangements (e.g. raffles, fishing competitions, government grants)
- obtaining necessary approvals, including associated consultation
- developing and implementing fish stocking management plans, including monitoring of the fishery and habitat (e.g. netting, trapping, angling surveys), selecting fish species, numbers and size, and carrying out approved/permitted stocking operations
- providing a public liaison and education function.

Program goals

Long-term and short-term goals should be defined for each stocking program, and success evaluated via the monitoring program. At a minimum, this will involve:

- identifying the primary purpose for stocking (refer to section 7)
- defining measurable social, economic and/or environmental goals (e.g. percentage increase in recreational fishing participation, percentage increase in recreational catch rates, percentage increase to native fish population, percentage decrease in mosquito larvae)
- defining minimum standards for survivorship, genetic diversity, abundance etc.

Goals for fish stocking must take into account existing uses and objectives of the waterway. For example, if a stocking goal is based on fish remaining contained and unable to breed, it would be incompatible with a waterway where fish passage is a condition of waterway barrier works (as per the Planning Act).

Stocking groups are encouraged to focus on all aspects of the fishery to maintain and improve recreational fishing. This can include habitat improvement, fish attracting structures, facilities for recreational fishers, fishing competitions and access to the fishery.

Choice of species

Fish stocked must be the correct genetic strain and species for the receiving waterbody. Species that are suitable for each catchment are listed in Appendix 1.

Appendix 1 also includes areas where private stocking may occur, while public stocking of waterways is prohibited. To remove any doubt public stocking for recreational fishing is not supported in the catchments identified in Appendix 3 regardless of if they appear in Appendix 1.

The absence of a species from the catchments maps in Appendix 1 does not definitively rule in or out their presence and only provides a guide as to where stocking may be supported. Stocking in other areas may be supported as new information becomes available or under consideration of the requirements in sections 9.1 and 9.4.

The following condition will usually be applied to all general fisheries permits for stocking (where applicable):

- non-indigenous fish mentioned in schedule 4, part 2 of the Fisheries (General) Regulation must be stocked into the waters that correspond to the species in schedule 4, part 2.

Any stocking of different genetic strains requires a new or amended general fisheries permit before fish are ordered and stocked. Refer to section 9.4 for guidance about applying to add a new species or a new genetic strain to an existing stocking program.

Receiving environment/waters

Suitable catchments for fish stocking are listed under the species suitable for fish stocking in Appendix 1 (see above).

Fish stocking is restricted in several catchments of Queensland because these catchments have conservation value, self-sustaining native fish populations, translocation fish stocking has not occurred and/or translocated species released have not established self-sustaining populations.

Fish stocking of public waters for the purpose of recreational fishing is not permitted in the Lake Eyre Basin, Cape York (Jacky Jacky, Olive, Pascoe, Lockhart, Stewart, Hann, Normanby, Gilbert, Einasleigh, Staaten, Mitchell, Alice, Palmer, Walsh, Coleman, Edward, Holroyd, Kendall, Archer, Coen, Watson, Embley, Mission, Wenlock, Dulhunty, Skardon, Jackson, Jardine and Torres Strait Islands river basins), Noosa River, Tinana Creek and tidal waters of Queensland (rivers, bays and oceans). See Appendix 3 for a map of these locations.

Translocation fish stocking of non-indigenous fish is not permitted in all catchments of Lake Eyre, Bulloo-Bancannia, Murray–Darling and Gulf of Carpentaria, and the Baffle, Barron, Bloomfield, Curtis Island, Daintree, Endeavour, Fraser Island, Hann, Hinchinbrook Island, Jacky Jacky, Jeannie, Lockhart, Mossman, Mulgrave, Murray, Noosa, Normanby, North Johnstone, Olive, Pascoe, Russell, Shoalwater, South Johnstone, Stewart, Stradbroke Islands, Tully, Waterpark and Whitsunday Islands catchments. See Appendix 4 for a map of these locations.

In general, more stringent requirements apply to stocking rivers as opposed to impoundments because rivers are considered open systems with wild populations of fish (enhancement stocking). Impoundments are usually closed systems in which the stocked species create a fishery that would otherwise not be available (put–grow–take stocking).

The following conditions will usually be applied to all general fisheries permits:

- non-indigenous fisheries resources must NOT be released into the waters of the river basins mentioned in schedule 2 of the Fisheries (General) Regulation
- non-indigenous fish mentioned in schedule 4, part 2, column 2 of the Fisheries (General) Regulation must be stocked into the waters that correspond to the species in schedule 4, part 2.

Table 3 outlines other factors to consider when assessing applications.

Table 3: Receiving water considerations

| Issue | Considerations to guide assessment |
|---------------------------------------|---|
| Minimum requirements for water levels | <p>The potential impact of drought and/or low water levels should be taken into account when considering a waterbody's suitability. If the minimum water levels are insufficient to sustain additional fish populations, the waterbody may be unsuitable for stocking.</p> <p>If available, this data should be sourced from the relevant water management agency (i.e. Seqwater, Sunwater, Department of Regional Development, Manufacturing and Water or local government).</p> |
| Impact on threatened species | <p>Information must be provided about existing flora and fauna, including the presence of species of conservation interest such as endangered fish, frogs or turtles. If not available from desktop studies, this must be obtained by a pre-stocking survey.</p> <p>Waterbodies with a high potential to impact upon threatened species should be avoided. This may be influenced by the characteristics of the waterbody or its regional importance as a habitat for threatened species.</p> |
| Habitat quality and enhancements | <p>The receiving environment should have sufficiently good quality habitat to support additional fish populations. Concurrent habitat enhancement programs such as rehabilitation or fish attracting structures may increase the suitability of an impoundment.</p> <p>A best practice manual for Australian freshwater fisheries is being developed as part of a Fisheries Research and Development Corporation habitat project at Cressbrook Dam. This is due for completion in 2–3 years.</p> |
| Barriers to fish movement | <p>Certain fish species require unrestricted movement along a waterway in order to complete their life cycles (refer to Appendix 5 for more information). Waterway barriers may therefore be important in achieving the stocking objectives, depending on whether the objective is to allow or prevent completion of the life cycle by stocked fish. For example, many stocking plans include regular maintenance stocking of diadromous species as they are unable to complete their lifecycles within an impoundment (for example Australian Bass), while other species have low levels of maintenance stocking as they can complete their lifecycles within impoundments (for example Saratoga species).</p> |

Source of fingerlings

Fish for stocking must be sourced from one or more of the following:

- a hatchery authorised by a development approval for aquaculture
- a hatchery that does not sell or trade fingerlings and does not require a development approval, but is operating under an equivalent or appropriate quality assurance program
- another catchment (translocation approved by a separate general fisheries permit).

Hatcheries producing fish for aquaculture (i.e. for sale) are authorised by a development approval for aquaculture under the Planning Act. Conditions of the development approval will specify requirements for the hatchery quality assurance program.

If an application for stocking involves a hatchery that does not produce fish for sale (i.e. a hatchery run by a stocking group solely to produce fingerlings for local stocking), a copy of the hatchery's assurance program must be provided to ensure it sufficiently manages risk. As a guide, Fisheries Queensland will seek an equivalent standard to that of a hatchery approved under a development approval. Fisheries Queensland will work with hatcheries to assist with the development of an assurance program if required.

Hatchery quality assurance programs should ensure the following criteria are met before fish are provided for release:

- minimum disease and health criteria
- minimum criteria for survivorship and minimisation of deformities
- correct genetic strain as stated on the stocking permit
- compliance with a genetic resource management plan to minimise inbreeding and outbreeding depression, and to minimise impact on wild populations—production of fingerlings for stocking requires a more stringent regime of maintaining natural levels of genetic diversity compared with those producing fingerlings for aquaculture
- a means to identify hatchery-produced fish—under the *Broodstock and culture stock collection policy*, all broodstock are to be fin clipped at the expense of the permit holder and samples of fin clips must be provided to Fisheries Queensland for each broodstock within one month of collection for each individual (this will enable the use of genetic sequencing techniques of fin clips to determine parentage of offspring for compliance operations if necessary, and a process to ensure freedom from contaminants such as insects, aquatic plants and incidentally included fish species, including inspection of fingerlings and appropriate management and treatment of transport water and equipment).

Translocation of fish from one catchment to another requires approval under a separate general fisheries permit. The following principles are considered when assessing the translocation of fish species:

- new translocations will only be considered if there is very good evidence that the risk to the receiving environment is minimal
- stocking with translocated species will only be considered if a potential economic, social or conservation benefit can be demonstrated and if no alternative native species in the drainage basin have similar potential
- translocation of threatened species is supported for the purpose of conservation stocking—the emphasis of this type of stocking should be the establishment of breeding populations
- translocations, for the purpose of recreational fishing, will not be permitted in catchments where
 - the species translocated is non-indigenous and the catchment is listed in Appendix 4
 - the integrity of native fish communities remains substantially intact
 - there are one or more threatened species of fish (conservation priority catchments) and/or
 - there are species of conservation interest that would be adversely impacted by stocking
- with the exception of threatened species, preference will be given for translocating species that will not reproduce in their target environment
- if a basin or river system is contiguous (shared) with another state, the agreement of that state will be obtained before any translocation can take place—Queensland will seek reciprocal agreements from other states
- all potential translocations will be subject to a disease risk assessment to minimise the risk of disease transfer
- all proposals to translocate fish species or non-indigenous stocks of the same species will be considered on a case-by-case basis according to the decision-making protocols and procedures.

Translocation of barramundi between management units

There are six barramundi management units across Queensland, which are historically isolated and independently evolving sets of populations but not necessarily separate entities:

- south-east Gulf of Carpentaria stock (Point Parker to Pera Head)
- north-west Cape York stock (Pera Head to Escape River)
- east-coast Cape York stock (Escape River to Cooktown)
- mid-north east coast stock (Cooktown to Burdekin River)
- central east coast stock (Repulse Bay to Shoalwater Bay)
- south east coast stock (Fitzroy River to Mary River).

Given the low level of genetic differences between management units, limited translocation between adjacent units is permissible if a clear social and economic benefit can be demonstrated.

Permission from the water storage operator

Written permission from the water storage operator to use the impoundment for fish stocking for recreational purposes is required if the operator is a separate entity to the applicant. For areas with ongoing stocking programs regular consultation between stocking groups and impoundment managers is expected to occur. It is highly recommended that any proposed significant changes to species composition are discussed with water storage managers prior to a new or amended GFP application being submitted. At reissue, water storage operators will be requested to comment on GFP conditions before final permits are granted.

Public access

Proposals to stock for recreational fishing purposes must ensure public access is normally available to stocked fishing locations (noting that from time-to-time infrastructure operators may introduce temporary closures for operational or public safety reasons). Public access is particularly important for the SIPS as public money is used for stocking.

Maintenance of public access may require negotiations with adjacent landholders, water storage operators and other government departments.

Funding model

It is recommended that stocking groups contact Fisheries Queensland first to ensure the activity aligns with the policy.

Funding available to stocking groups to purchase fingerlings is largely through:

- the SIPS
- various commonwealth, state and local government grant schemes for eligible stocking activities
- independent fundraising activities.

The main funding source for fish stocking associated with recreational fishing (enhancement and put–take–grow stocking) is the SIPS—introduced in 2000 with the aim of raising funds to help purchase native fish fingerlings for participating impoundments throughout Queensland. Anglers who fish in a SIPS impoundment are required by law to have a permit. Money raised from the sale of permits is distributed before the end of each financial year. At least 75% of the revenue from the sale of permits is provided to incorporated stocking groups (towards the purchase of fingerlings or other activities aimed at enhancing the fisheries in SIPS impoundments) and other approved activities that improve recreation fishing. Visit

fisheries.qld.gov.au for more information.

Stocking groups also undertake various activities to raise additional funds for the purchase of fingerlings and other costs associated with operating an incorporated group. Money is raised through fishing competitions, grants (local council, state government and industry), raffles, sausage sizzles, memberships, catering and sale of stocking group merchandise (e.g. shirts, caps, drink coolers, stickers).

Risk assessment

The precautionary principle strongly governs freshwater fish-stocking activities in Queensland. The precautionary principle is defined in the Fisheries Act as follows:

... if there is a serious or irreversible environmental damage, lack of scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation, or possible environmental degradation, because of the threat.

Standard risk assessment

The risk assessment tables in Appendix 6 should be used as a guide for assessment of new proposals. The policy recommendations for the three levels of risk ranking are:

- high risk—activity not supported
- medium risk—activity may be supported on a trial basis subject to monitoring and review
- low risk—activity may be supported.

Comprehensive risk assessment

In addition to the previous policy recommendations, the risk assessment for higher risk proposals (medium and high risks) must include:

- comprehensive risk assessment of impacts—genetic impacts, impact to other flora and fauna
- monitoring program (which may include surveys before and after stocking) to determine the impacts on the receiving environment
- a letter of comment or permit from relevant authorities such as the Commonwealth Department of Environment and/or the Wet Tropics Management Authority.

The risk assessment tables in Appendix 6 will still form the basis of assessment.

Fish stocking management plan

The plan must provide details of the stocking regime and manage all the risks identified in the risk assessment. Compliance with the plan will be a condition of the general fisheries permit (if issued) and must include:

1. objectives and milestones (refer to previous section on program goals)
2. full details of fish to be released—source, species etc. (refer to previous sections on choice of species and source of fingerlings)
3. proposed release sites—including any habitat alterations such as fish attracting structures
4. stocking regime—stocking rates, numbers to be stocked, size of released fish, water levels, proposed sequence of stocking over the duration of permit, time of stocking, release methods, species composition and proportions of each type
5. monitoring, evaluation and improvement (see next section on monitoring and evaluation).

Stocking regime details

An important component of the plan will be to determine optimal release strategies. The life history of fish species (refer to Appendix 1) and the ecological attributes of the area should be incorporated into stocking regimes, particularly for enhancement stocking. Where insufficient information is available, small-scale trials may be required to refine stocking parameters under a general fisheries permit.

Table 4: Stocking regime considerations

| Issue | Considerations to guide assessment |
|---|---|
| Stocking rates | <p>The limited data available for some of the more heavily stocked impoundments suggests an initial stocking level of between 500 and 600 fingerlings per hectare of surface area (at full supply level) for the first year, with an annual maintenance stocking level of 100–200 fingerlings (50 mm) per hectare of surface area at full supply level per season.</p> <p>Adequate monitoring of impoundments (survival and harvest/mortality of species) is essential if optimum stocking rates are to be developed for each impoundment.</p> |
| Numbers to be stocked | <p>Annual maintenance stockings are calculated at a maximum of 100–200 fish per hectare per year at full supply level. This rate is calculated at an average fingerling size of 50 mm and is a combined limit for all species stocked. This rate may be reduced where species of conservation interest are present, or where monitoring indicated that fish may be overstocked (i.e. high numbers of undersize fish).</p> <p>Barramundi may be stocked up to a maximum of 300 mm. As the size of these fingerlings increase, the number of fish per hectare will decrease. The sliding rate for size of fish is:</p> <ul style="list-style-type: none"> • 35–50 mm—200 fish per hectare • 50–100 mm—120 fish per hectare • 100–150 mm—80 fish per hectare • 150–200 mm—50 fish per hectare • 200–300 mm—35 fish per hectare. |
| Size of released fish | <ul style="list-style-type: none"> • Generally fingerlings are stocked at a minimum of 35 mm with a maximum size of 100 mm. • Barramundi may be stocked up to a maximum size of 300 mm. No maximum size applies to saratoga. • Fish stocked primarily for conservation purposes may be stocked at sizes less than 35 mm. |
| Proposed sequence of stocking over the duration of permit | To be adjusted for life history of fish, the type of fish stocking and external factors such as harvest rates and fingerling loss. |
| Time of stocking | To be adjusted for life history of fish, the type of fish stocking and external factors such as harvest rates and fingerling loss. |
| Release location and method | To be adjusted for life history of fish, the type of fish stocking and external factors such as harvest rates and fingerling loss. |
| Proportions of each species | To be adjusted for life history of fish, the type of fish stocking and external factors such as harvest rates and fingerling loss. |
| Water level | Consult relevant literature and water storage operators for best advice and local knowledge. |
| Contingency plans for low water levels | <p>The survival of stocked fingerlings in impoundments is greatly reduced by low water levels. Predators become more concentrated and suitable habitat is restricted during periods of low storage capacity. Survival of fingerlings tends to be best if they are stocked when water levels are high.</p> <p>Stocking is not recommended if a dam has been rapidly drawn down to less than 15% of its full supply volume, or less than 20% of its full supply surface area.</p> |

| Issue | Considerations to guide assessment |
|---|--|
| | <p>However, if a dam has been at a low storage level for an extended period (i.e. several years), a balance is likely to have been reached between the existing fish populations and the available food and habitat. In such a situation, stocking of fish at a density in proportion to the new storage surface area could proceed.</p> <p>Every impoundment is different and advice should be sought from Fisheries Queensland during development.</p> |
| Contingency plans for overtopping during floods | This may include barrier nets, timing of stocking etc. |

Monitoring and evaluation

Each proposal should develop an evaluation and monitoring plan (to the satisfaction of Fisheries Queensland) that will:

- assess the project in terms of its stated objectives by using quantitative measures of success
- use adaptive management to evaluate and improve management strategies and tactics—this includes monitoring the stocked fisheries to optimise stocking rates and minimise risks to the environment.

Reporting and auditing requirements

Stocking activities that are part of a SIPS grant will require acquittals for expenditure as required in the deed of grant, including a bank statement, invoice and signed acquittal. All stocking permits require an annual report on stocking activities to be provided to Fisheries Queensland.

9.2 New public impoundment

All the general requirements outlined in section 9.1 will apply to applications to stock a new public impoundment.

9.3 New river/waterway

This section relates to applications that are received for stocking 'new river/waterways' that have not been previously stocked (i.e. rivers not previously stocked and sections of rivers, including downstream of stocked impoundments).

All the general requirements outlined in section 9.1 will apply, in addition to the following considerations:

- a demonstrated need to stock
- land uses
 - land subject to native title
 - proposals within the wet tropics area under the Wet Tropics World Heritage Protection and Management Act may require a permit from the Wet Tropics Management Authority
 - under the Nature Conservation Act, live animals (including fish) must not be taken into a protected area—includes national parks (scientific, Aboriginal land or Torres Strait Islander land), conservation parks and resources reserves
- quality of receiving water
 - the receiving waterbody must provide all of the basic requirements for growth and survival of the stocked species—including suitable water quality with the appropriate range of water

parameters (e.g. temperature) for each species, adequate habitat for feeding and shelter and abundant food in the appropriate size ranges

- many environmental considerations can be addressed by stocking species that are endemic to the release area
- carrying capacity of receiving water is an important concept to consider—every waterway has a limit to how many fish it can support and if a waterway is stocked too heavily, there is likely to be increased mortality (due to predation, starvation and increased disease), reduced growth rates and increased dispersion
- impact on the ecosystem—including threatened species.

9.4 New species or genetic strain to an existing stocking program

All the general requirements outlined in section 9.1 will apply to applications to add a new species or genetic strain to existing stocking program.

In addition, the following process must be undertaken:

1. risk assessment to assess the impact on environment, fauna and flora etc.—the proposal can only continue if the risk assessment concludes the impact will be minimal
2. stocking trial of the new species, with a monitoring program sufficient to identify any significant impacts and determine the success of stocking
3. evaluation of the results of the stocking trial and recommendations—includes identifying any significant environmental, social or economic impacts
4. new species recommended for stocking are added to schedule 1 of the Fisheries (General) Regulation under the Queensland Government legislation review process (if applicable).

The risk assessment process for new species must consider the following:

- availability of hatcheries to produce the species and/or genetic strain
- any requirement to translocate from another area—new translocations will only be considered if there is very strong evidence that the risk to the receiving environment is minimal
- the ability of the species to reproduce in the new environment—may be necessary in some cases (e.g. conservation or enhancement stocking).

Proposals within the wet tropics area under the Wet Tropics World Heritage Protection and Management Act may require a permit from the Wet Tropics Management Authority.

9.5 Mosquito control in fresh waters

All the general requirements outlined in section 9.1 will apply, in addition to the following specific considerations.

Stocking of native freshwater fish for mosquito control is supported in the following circumstances:

- the species of freshwater fish proposed for stocking is found naturally in the local area
- the surrounding habitat is suitable for both mosquito control and stocking of small native freshwater fish.

Different protocols are to be followed depending on whether the stocking is to occur in private or public waters. The species of fish that may be used differs between catchments.

9.6 Decision-making

Decisions are made by officers delegated under the Fisheries Act to perform functions of the Chief Executive. The Chief Executive delegates functions to appropriately qualified public service employees. Delegated officers in Fisheries Queensland consider an application for the issue of an authority (general fisheries permit) under the Fisheries Act. This includes the issue of an authority for fish stocking.

Delegates apply the principles of this policy, the Fisheries Act and good decision-making set by the Queensland Ombudsmen when considering an application and making a decision.

Decisions may be appealed or reviewed under the Fisheries Act and *Judicial Review Act 1991*. The Judicial Review Act establishes a requirement for proper process and fairness in administrative decision-making.

10 Responsibilities

Fisheries Queensland (within the Department of Agriculture and Fisheries) is responsible for ensuring public fisheries resources are managed and used sustainably. This includes issuing general fisheries permits for fish stocking, development of fish stocking management plans, recording of fish stocking events, and administration and management of the SIPS.

Biosecurity Queensland (within the Department of Agriculture and Fisheries) is responsible for the management of disease and pests, including pest fish species such as tilapia and carp. Fisheries Queensland manages non-indigenous fish such as redclaw, crayfish etc.

The Queensland Boating and Fisheries Patrol (within the Department of Agriculture and Fisheries) is responsible for monitoring and enforcement of compliance with fisheries legislation.

Fish stocking groups are responsible for stocking fish in their area. This includes ordering of fingerlings, grant applications and acquittals, fundraising events, some fish salvages, local fishing comps, developing stocking applications, and associated monitoring and risk assessment.

Stocking groups and hatcheries are also responsible for complying with the general biosecurity obligation under the Biosecurity Act. This includes undertaking basic health and contamination checks for disease and pests on, or mixed in with, fingerlings before release.

All fishers are responsible for complying with fishing rules to ensure public fisheries resources are used sustainably.

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Simpson, B, Hutchison, M, Gallagher, T & Chilcott, K 2002, *Fish stocking in impoundments: A best*

practice manual for eastern and northern Australia, Department of Primary Industries, Queensland.

Legislation

For Queensland legislation, visit [legislation.qld.gov.au](https://www.legislation.qld.gov.au).

For Commonwealth (Cth) legislation, [legislation.gov.au](https://www.legislation.gov.au).

Biosecurity Act 2014 (Qld)

Environment Protection and Biodiversity Conservation Act 1999 (Cth)

Fisheries Act 1994 (Qld)

Fisheries Declaration 2019 (Qld)

Fisheries (General) Regulation 2019 (Qld)

Nature Conservation Act 1992 (Qld)

Nature Conservation (Wildlife) Regulation 2006 (Qld)

Planning Act 2016 (Qld)

Wet Tropics World Heritage Protection and Management Act 1993 (Qld)

Wet Tropics Management Plan 1998 (Qld)

Useful resources

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Appendix 1: Fish species and catchments suitable for stocking

The basins where each species may be stocked include:

- those in which the fish species occur naturally
- or
- those in which the fish species had been stocked regularly as part of the Queensland Government's stocking program and where recreational fisheries have been established.

Fish species suitable for stocking must have part of their life cycle in fresh water. Appendix 1 includes areas where private stocking may occur, while public stocking of waterways is prohibited. To remove any doubt public stocking for recreational fishing is not supported in the catchments identified in Appendix 3 regardless of if they appear in Appendix 1.

The absence of a species from the catchments maps in Appendix 1 does not definitively rule in or out their presence, only provide a guide as to where stocking may be supported. Stocking in other areas may be supported as new information becomes available or under consideration of the requirements in sections 9.1 and 9.4.

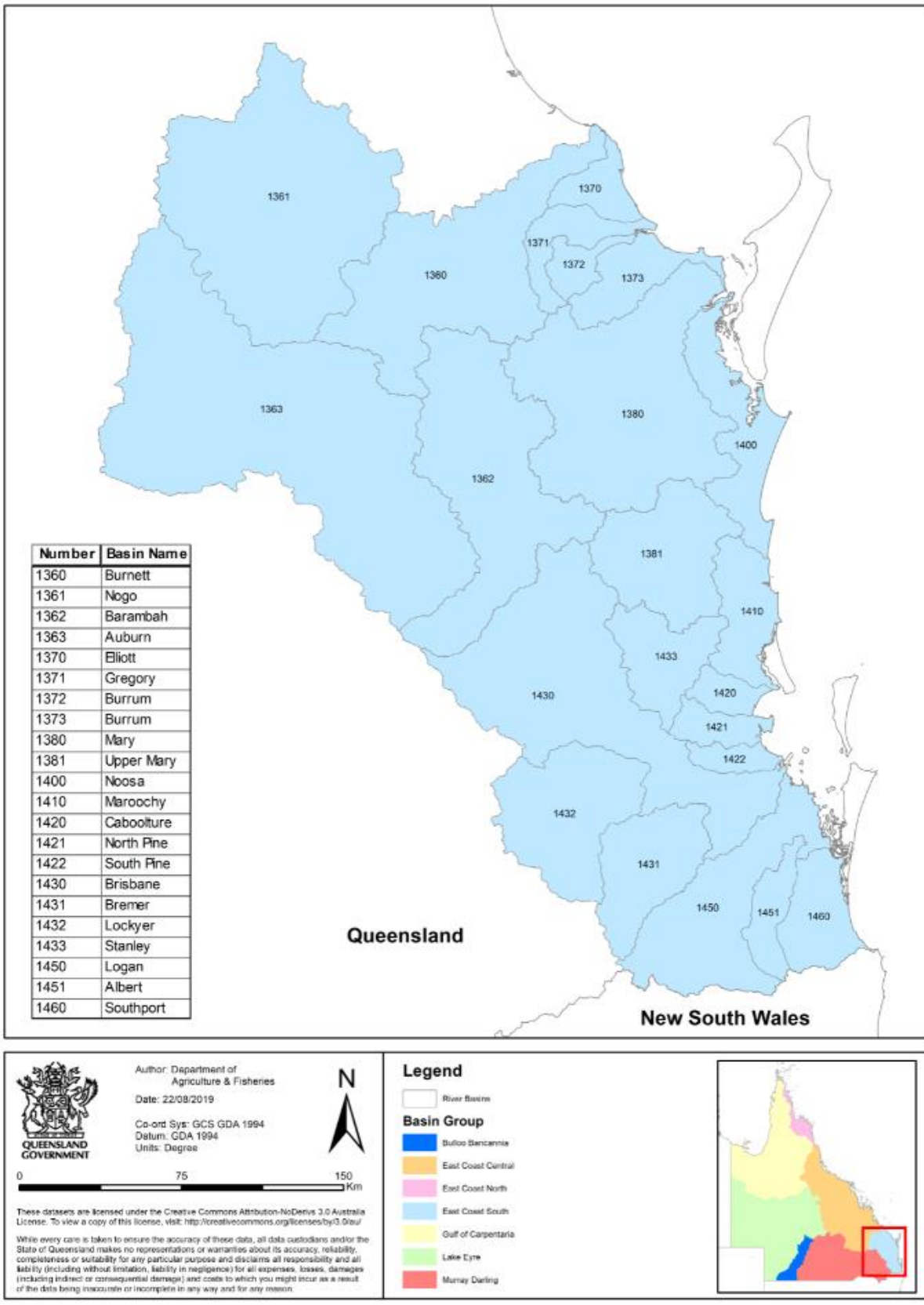
Australian bass

| Australian bass (<i>Macquaria novemaculeata</i>) | |
|--|--|
| Distribution | Rivers and estuaries in south-eastern Queensland, from the Burnett-Mary River to the New South Wales border |
| Habitat | Widespread within river systems, from estuarine areas to high elevation tributaries |
| Diet | <ul style="list-style-type: none">• Juveniles—aquatic insects, microcrustaceans, terrestrial invertebrates, filamentous algae• Adults—larger crustaceans, aquatic insects, fish, molluscs, aquatic vegetation |
| Longevity | 22 years |
| Age (and size) at maturity | <ul style="list-style-type: none">• Males: 2–4 years (18–20 cm)• Females: 5–6 years (20–28 cm) |
| Spawning season | June–August |
| Spawning cue | Decreased temperature and photoperiod |
| Fecundity | Varies with size: 49 000 (female size 270 mm) to 1 429 000 (female size 446 mm) |
| Threats | Natural population reported to have declined due to overfishing, translocations, habitat destruction, stream acidification, flow regulation and barriers to movement |

Hatchery-reared fingerlings of Australian bass were first stocked by the Queensland Government in 1988. They have been stocked in most lakes and dams east of the Great Dividing Range, from Lake Monduran (Gin Gin) in the north to Hinze Dam (Nerang) in the south.

Australian bass appear to have comparatively high survival rates under most conditions, are aggressive takers of artificial lures and baits throughout the year and are excellent table fish. Their biggest drawback is their annual urge to seek estuarine spawning grounds. Large numbers migrate downstream over weir or dam walls, particularly during autumn/winter floods (Simpson et al. 2002). Bass will not reproduce in impoundments as they require salt water to breed.

River basins where Australian bass may be released



Map 1: Catchments in which Australian bass can be stocked

Barramundi

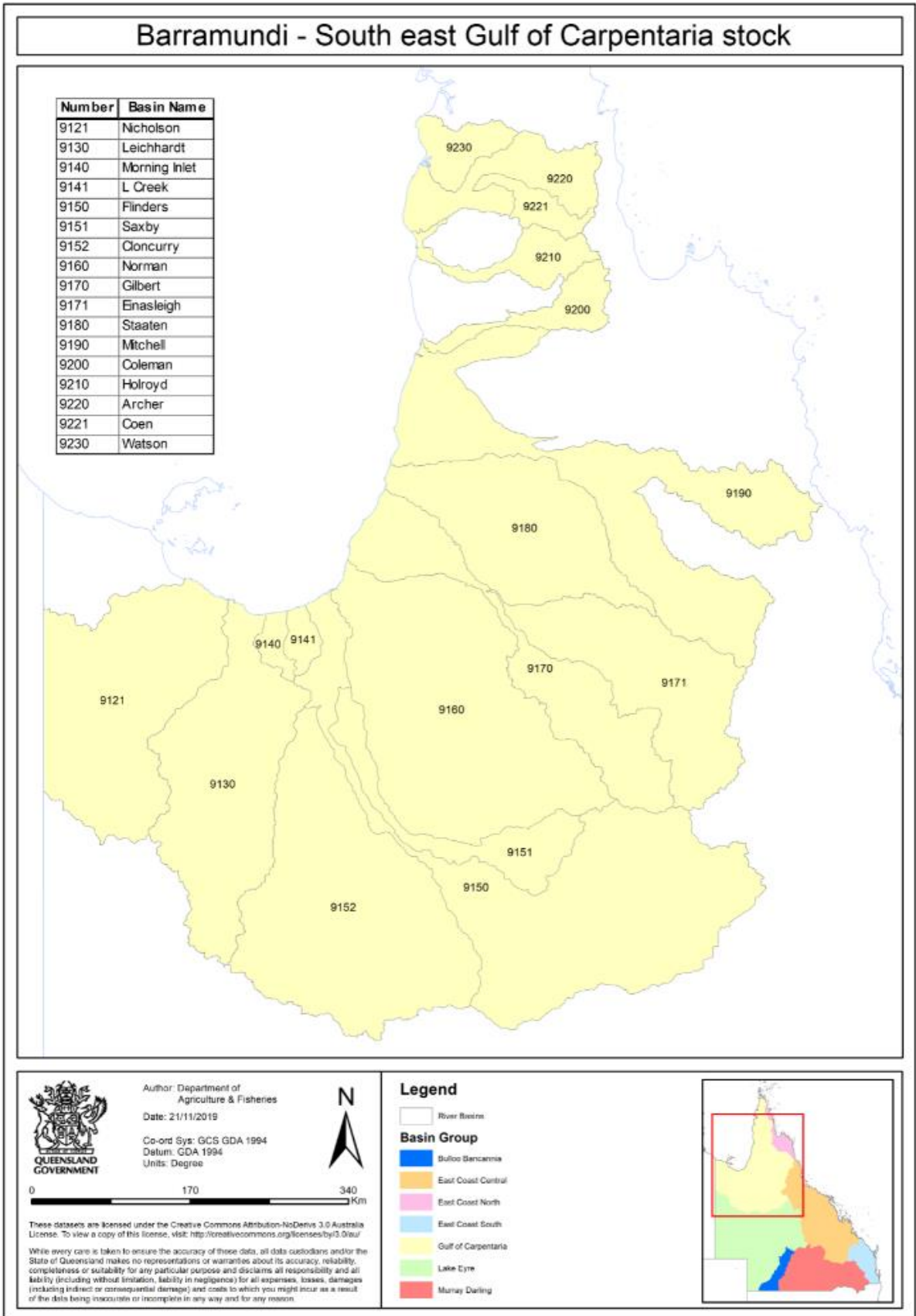
| Barramundi (<i>Lates calcarifer</i>) | |
|---|---|
| Distribution | Wild stocks of barramundi are found in freshwater lagoons, tidal rivers and estuaries from Maryborough to Torres Strait, throughout the Gulf of Carpentaria and across northern Australia |
| Habitat | <ul style="list-style-type: none"> • Large rivers with well-developed floodplains characterised by swamps and lakes, large discharge, low overall gradient and slow runoff • Critical chain of habitats required for different life stages • All life stages may disperse throughout waterways from estuaries to fresh water |
| Diet | Differing diet depending on age classes: <ul style="list-style-type: none"> • <8 cm—microzooplankton, small fish • 8–40 cm—macrocrustaceans, fish • >40 cm—fish commonly from families Clupeidae, Engraulidae, Gobiidae, Eleotridae, Mugilidae, Hemiramphidae, Melanataeniidae, Atherinidae, Chandidae, Plogosidae and Ariidae |
| Longevity | 14–20 years |
| Age (and size) at maturity | <ul style="list-style-type: none"> • Barramundi commence life as males and then turn into females at approximately 80 cm • Males mature at 3 years (60–70 cm) |
| Spawning season | October–February |
| Spawning cue | Water temperature 30 °C, high tide, new and full moon |
| Fecundity | 5 000 000 – 20 000 000 |
| Threats | Overfishing, habitat destruction |

There are six identified genetic strains of barramundi. Care must be taken to ensure that barramundi from one genetic strain are not stocked into river systems containing a different strain. Given the low level of genetic differences between management units, limited translocation between adjacent units is permissible if a clear social and economic benefit can be demonstrated and provided there is no hatchery producing fingerlings for that management unit.

The genetic strains and the catchments into which they can be stocked are listed below:

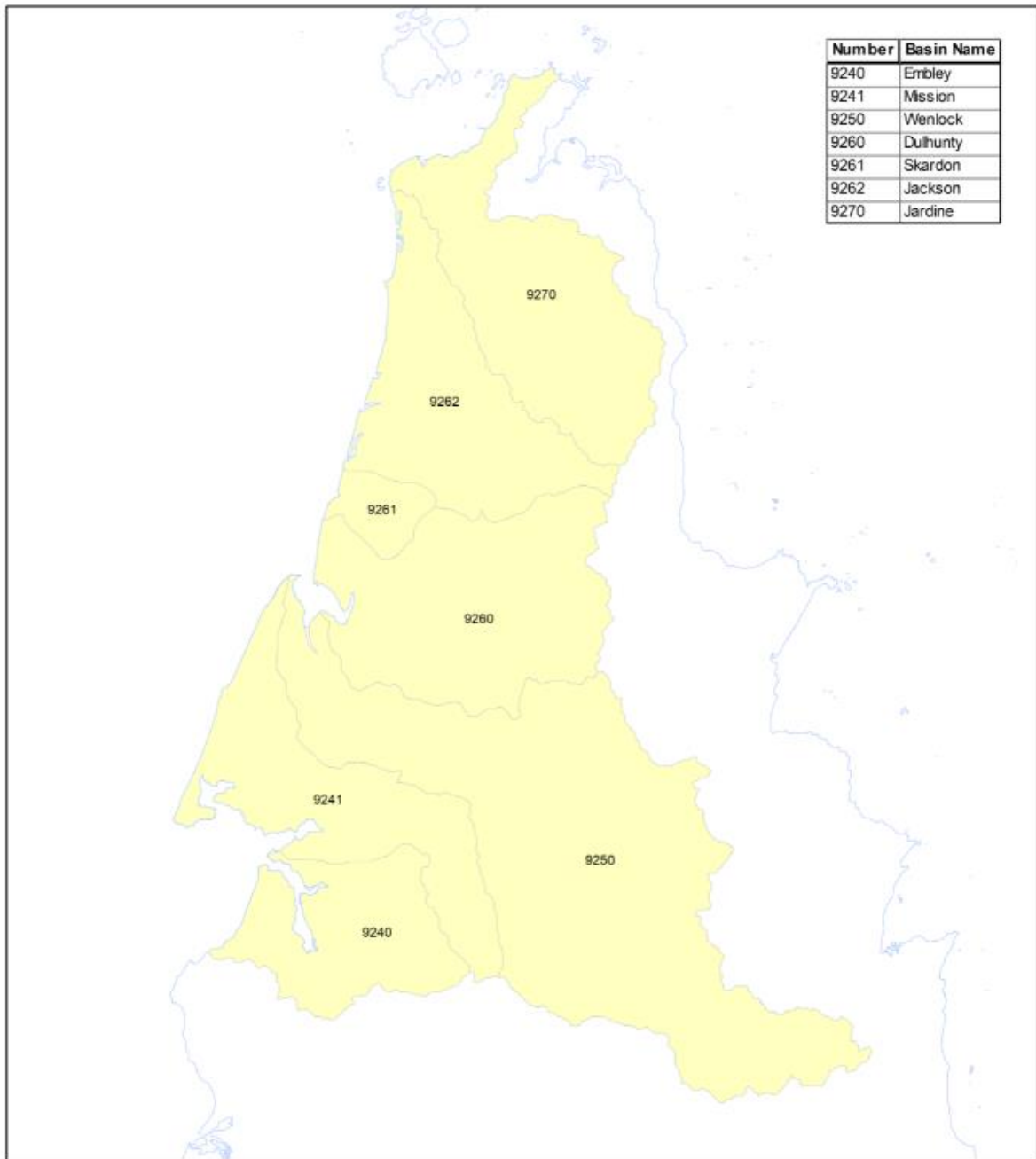
- south-east Gulf of Carpentaria stock (Point Parker to Pera Head)—Archer, Cloncurry, Coen, Coleman, Einasleigh, Flinders, Gilbert, Holroyd, L Creek, Leichhardt, Mitchell, Morning, Nicholson, Norman, Saxby, Staaten, Watso
- north-west Cape York stock (Pera Head to Escape River)—Dulhunty, Embley, Escape, Jackson, Jardine, Mission, Skardon, Wenlock
- east-coast Cape York stock (Escape River to Cooktown)—Hann, Jacky Jacky, Lockhardt, Normanby, Olive, Pascoe, Stewart
- mid-north east coast stock (Cooktown to Burdekin River)—Barron, Black, Burdekin, Daintree, Endeavour, Haughton, Herbert, Hinchinbrook Island, Mossman, Mulgrave, Murray, North Johnstone, Ross, Russell, South Johnstone, Tully, Hull, Moresby
- central east coast stock (Repulse Bay to Shoalwater Bay)—O’Connell, Pioneer, Plane, Shoalwater, Styx
- south east coast stock (Fitzroy River to Mary River)—Auburn, Baffle, Barambah, Boyne, Curtis Island, Dawson, Elliot, Fitzroy, Gregory, Isaac, Burnett, Burrum, Calliope, Comet, Kolan, Mackenzie, Mary, Nogo, Nogo.

Dams and river systems in north and central Queensland have been stocked with hatchery-reared fingerlings. In Queensland, it is recommended that barramundi for stocking purposes should be tested for nodavirus as per the translocation policy for barramundi . The fish-eating nature of barramundi may mean that stocking barramundi could be a threatening process for other fish and crustaceans. Barramundi will not reproduce in impoundments as they require saltwater to breed. Barramundi can be highly mobile, particularly during flow events and can move downstream in large numbers over barriers.




Map 2: Catchments in which barramundi (south-east Gulf of Carpentaria stock) can be stocked


Barramundi - North west Cape York stock



| Number | Basin Name |
|--------|------------|
| 9240 | Embley |
| 9241 | Mission |
| 9250 | Wenlock |
| 9260 | Dulhunty |
| 9261 | Skardon |
| 9262 | Jackson |
| 9270 | Jardine |



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Units: Degree




Legend

□ River Basins

Basin Group

- Bulloo/Bancannia
- East Coast Central
- East Coast North
- East Coast South
- Gulf of Carpentaria
- Lake Eyre
- Murray Darling



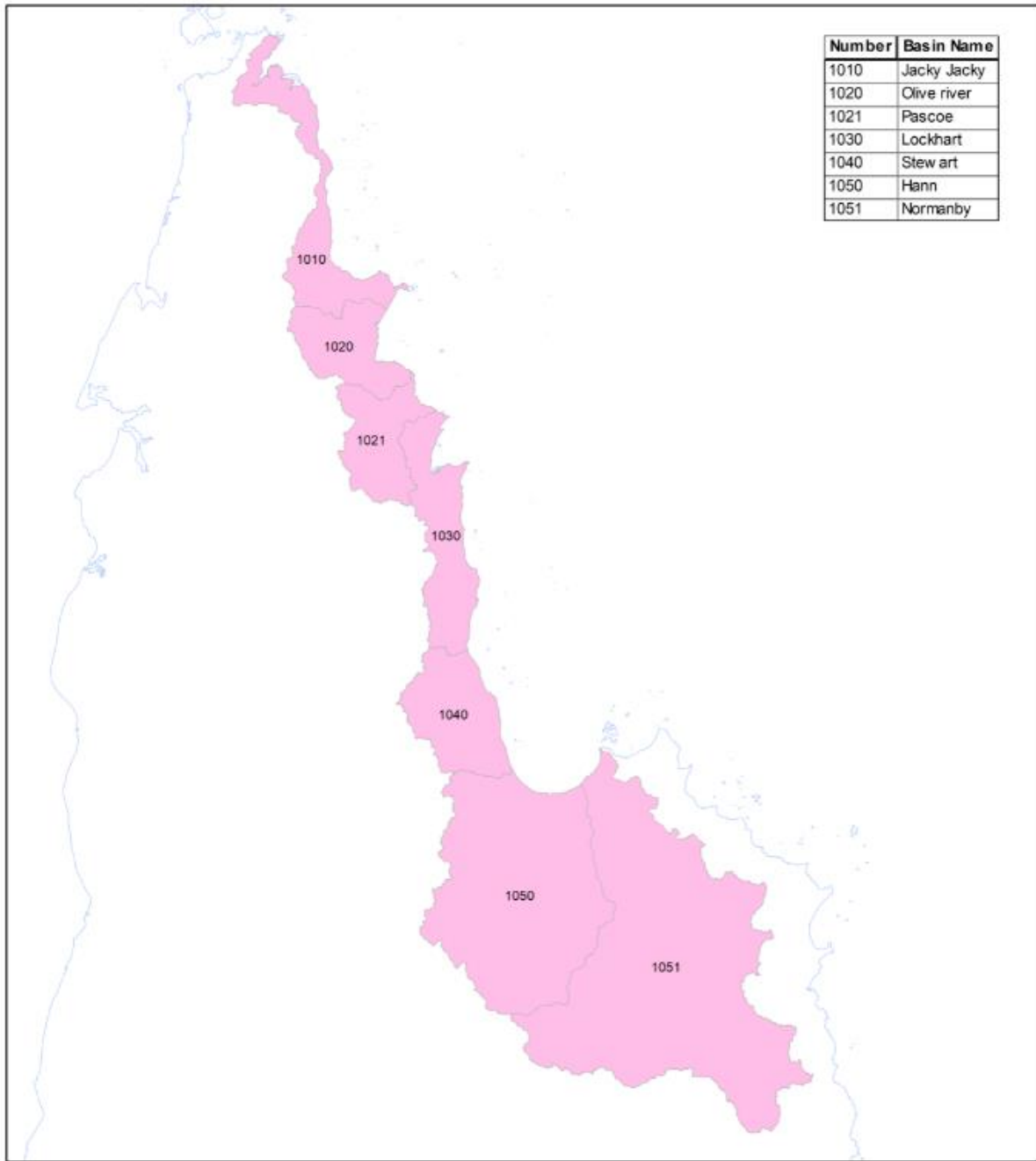
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Map 3: Catchments in which barramundi (north-west Cape York stock) can be stocked

Barramundi - East Coast Cape York stock



| Number | Basin Name |
|--------|-------------|
| 1010 | Jacky Jacky |
| 1020 | Olive river |
| 1021 | Pascoe |
| 1030 | Lockhart |
| 1040 | Stew art |
| 1050 | Hann |
| 1051 | Normanby |



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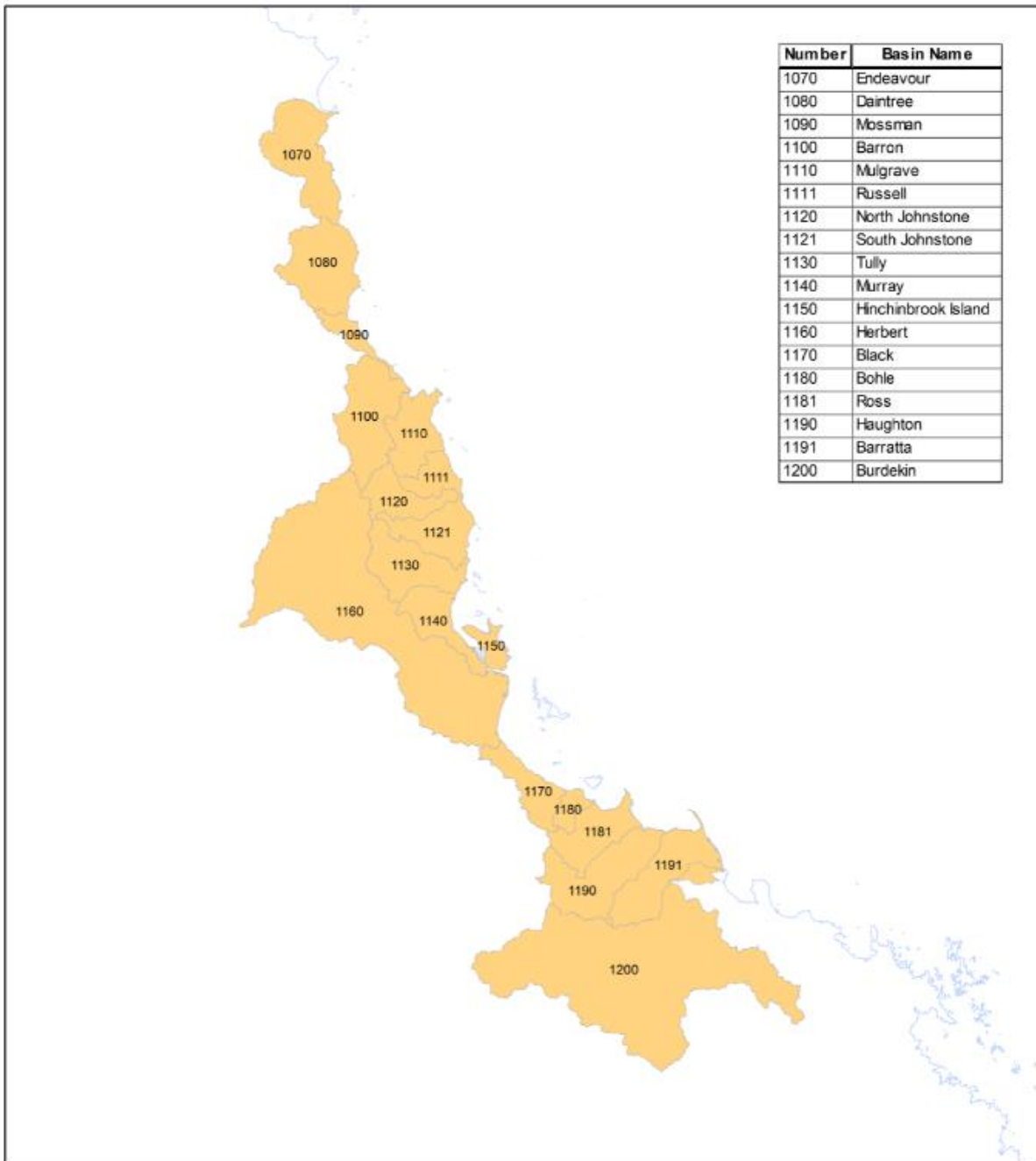
Legend


- River Basins
- Basin Group**
- Bulloo/Barnumia
- East Coast Central
- East Coast North
- East Coast South
- Gulf of Carpentaria
- Lake Eyre
- Murray Darling




Map 4: Catchments in which barramundi (east-coast Cape York stock) can be stocked

Barramundi - Mid-north east coast stock





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Legend

□ River Basins

Basin Group

- Bulloo/Barnum
- East Coast Central
- East Coast North
- East Coast South
- Gulf of Carpentaria
- Lake Eyre
- Murray Darling

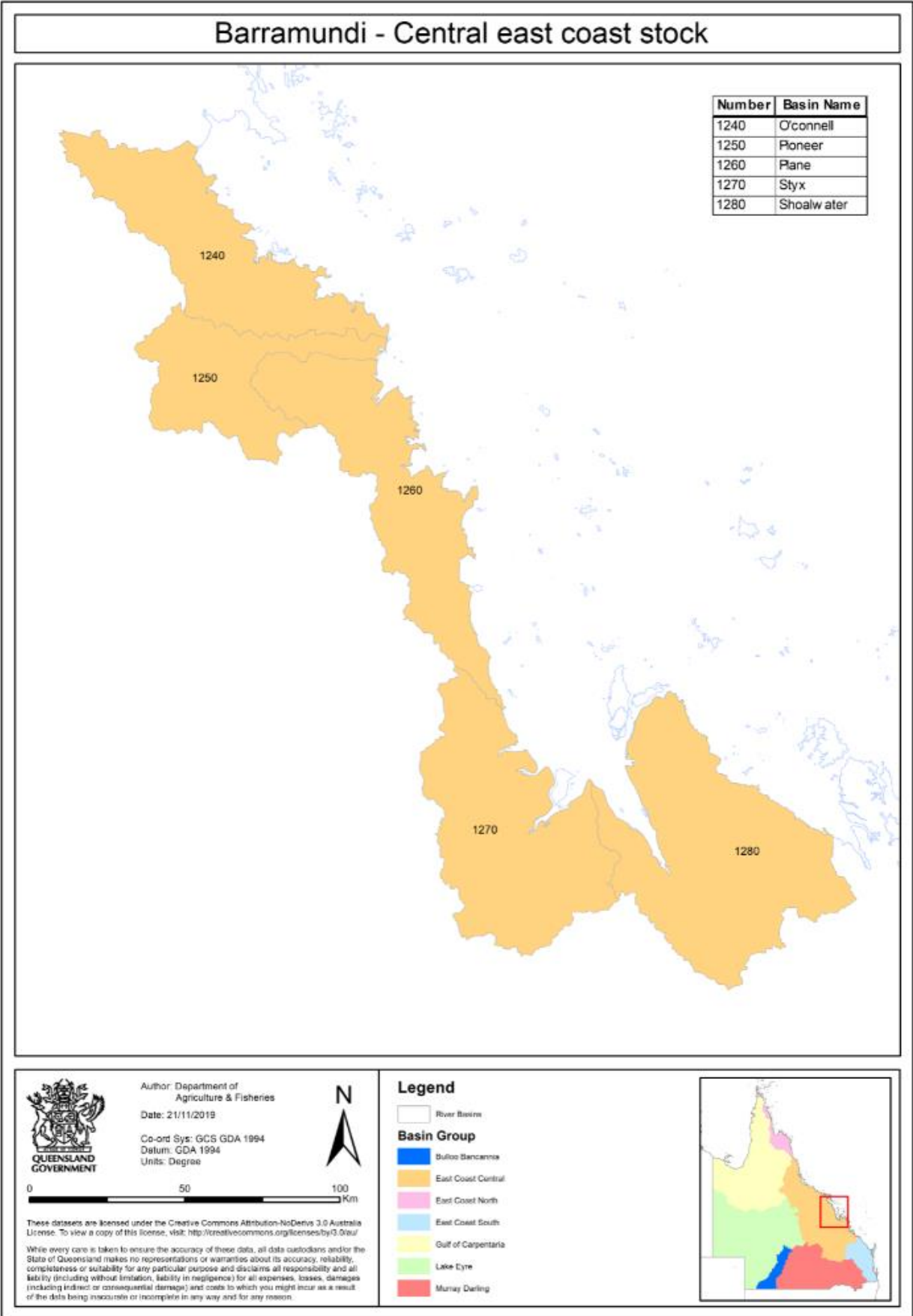


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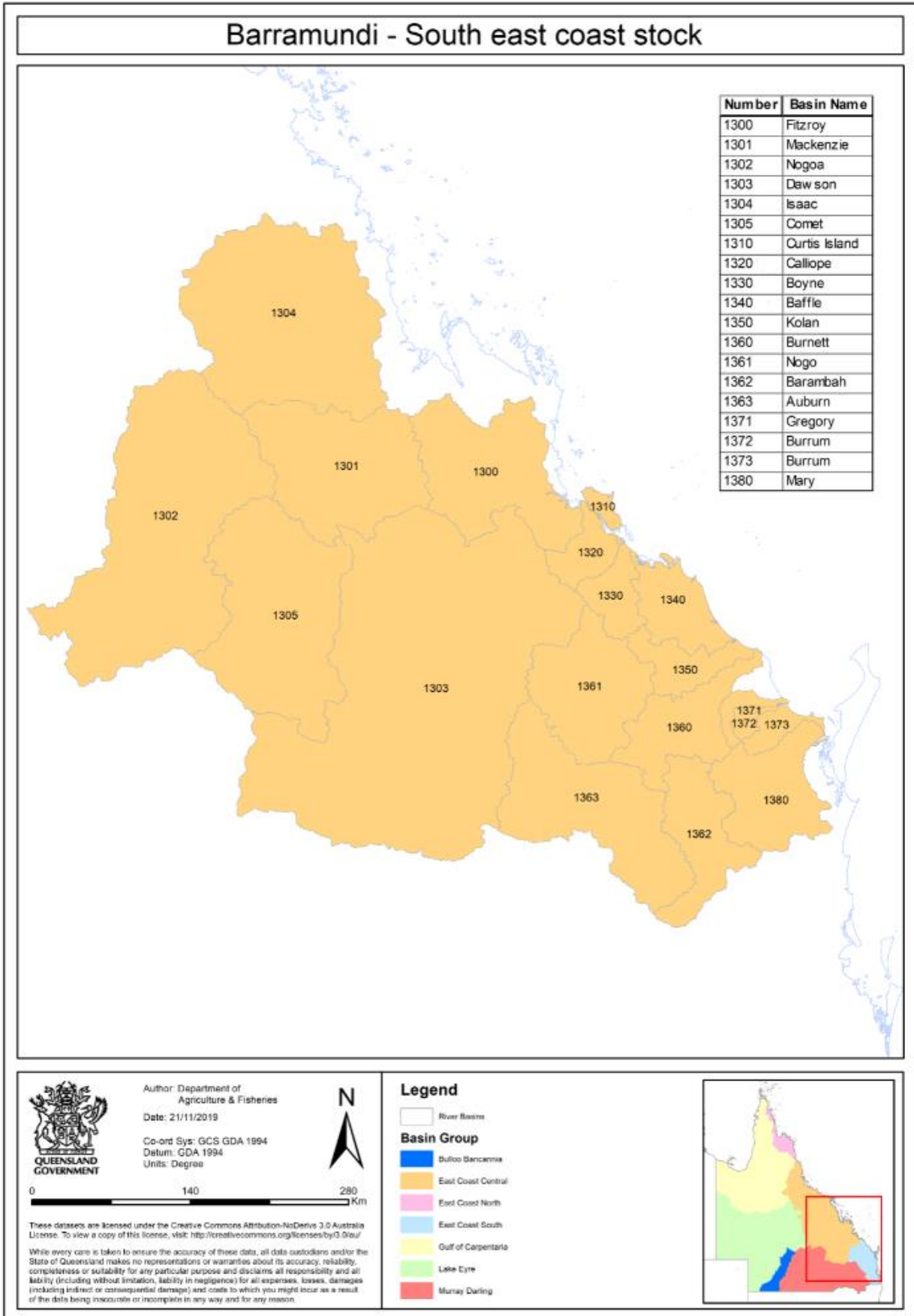
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Map 5: Catchments in which barramundi (mid-north east coast stock) can be stocked



Map 6: Catchments in which barramundi (central east coast stock) can be stocked



Map 7: Catchments in which barramundi (south east coast stock) can be stocked

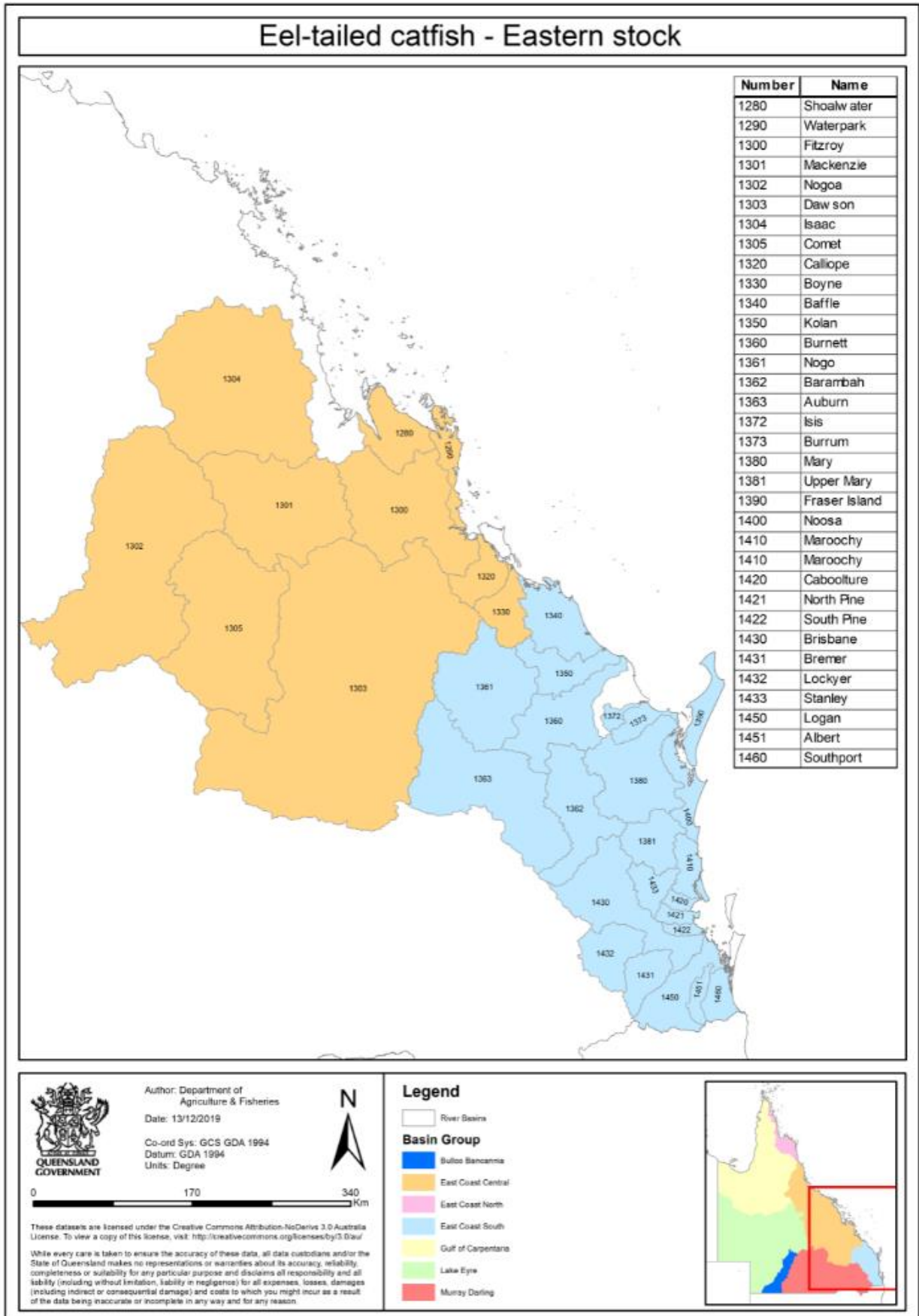
Eel-tailed catfish

| Eel-tailed catfish (<i>Tandanus tandanus</i>) | |
|---|--|
| Distribution | The natural distribution of eel-tailed catfish is in the Murray–Darling basin and eastern coastal drainages, from the border of New South Wales to the Burdekin River |
| Habitat | <ul style="list-style-type: none"> • Found in a variety of habitats, including small coastal streams, rainforest streams, large rivers, dune lakes and stream systems with sand gravel and cobble bottoms • Moderately abundant in waterways with instream cover, but not common where paragrass is abundant |
| Diet | <ul style="list-style-type: none"> • Juveniles—aquatic insects, microcrustaceans, terrestrial invertebrates • Adults—large crustaceans, aquatic insects, particulate detritus, molluscs, terrestrial invertebrates, fish |
| Longevity | 8 years |
| Age (and size) at maturity | 5 years (33–40 cm) |
| Spawning season | <ul style="list-style-type: none"> • Burnet Basin: October–January • Murray–Darling Basin: January–March |
| Spawning cue | Increased water temperature and water levels |
| Fecundity | 26 000 |
| Threats | Introduced species (e.g. carp), habitat degradation, water infrastructure, disease |

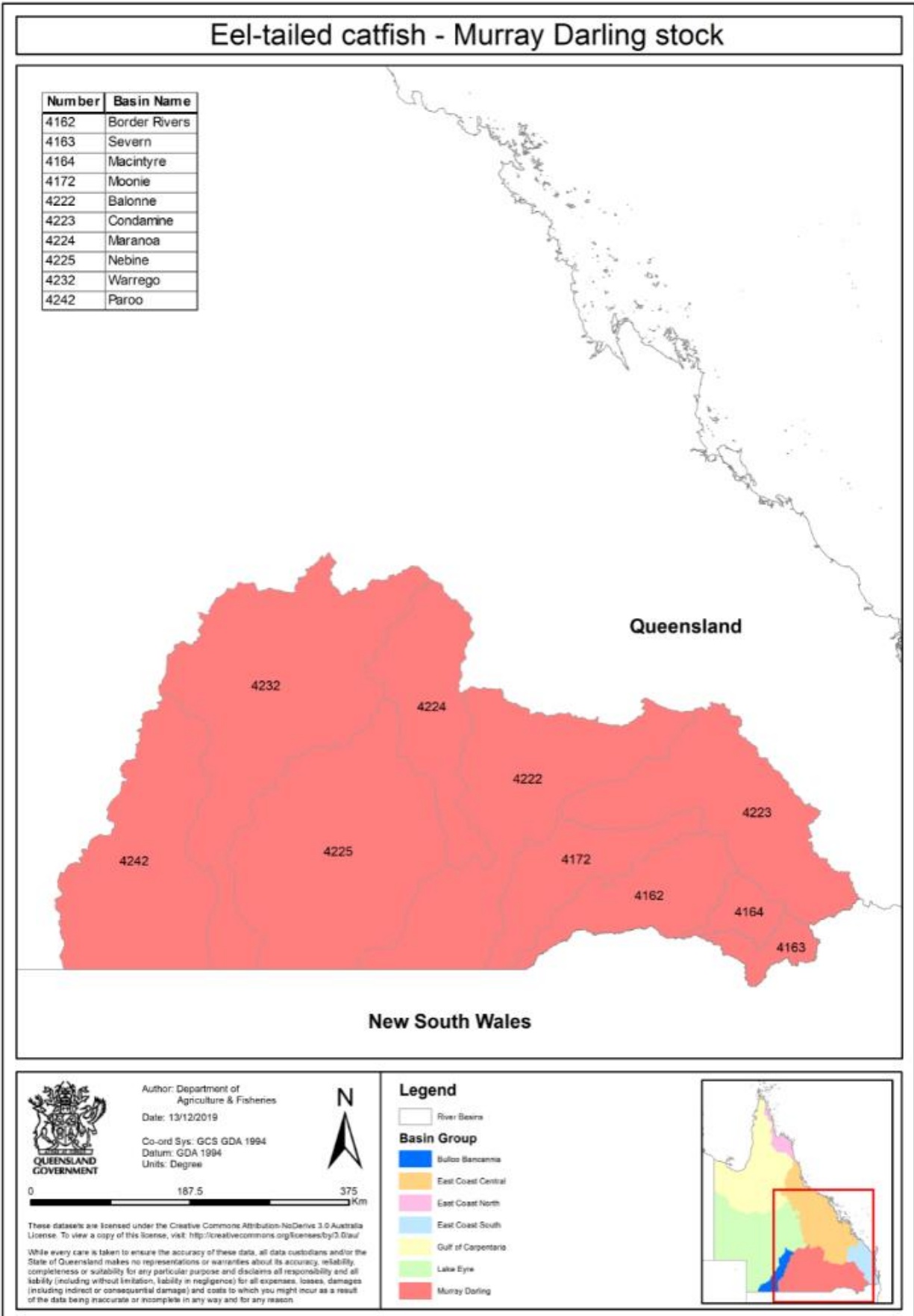
Eel-tailed catfish spawn and complete their entire life cycle in fresh water and will therefore reproduce in impoundments. Their nests are characterised by a circular, saucer-shaped depression in the substrate, 0.5–2 m in diameter, and are made of coarse sand or gravel with a central depression of coarser material such as rocks and sticks. They are a sedentary species with small home ranges.

There have been many introductions and translocations of hatchery-reared eel-tailed catfish to rivers and impoundments within and beyond their natural range. Eel-tailed catfish have been successfully introduced to the Burdekin and Fitzroy rivers where they did not naturally occur. There is some debate as to whether the population in the Pioneer River catchment is northern limit of *T.tandanus* or a translocated population. Further genetic work is needed to determine the status and origin of this population.

A second species of eel-tailed catfish (*Tandanus tropicanus*) is found in coastal rivers within the wet tropics region, including the Daintree, Mulgrave-Russell, Johnstone, Tully and Five Mile drainage basins. Distinct populations in Queensland are also thought to exist in the Murray–Darling Basin and rivers in south-eastern Queensland and the Fitzroy River.



Map 8: Catchments in which eel-tailed catfish (eastern stock) can be stocked



Map 9: Catchments in which eel-tailed catfish (Murray–Darling stock) can be stocked

Golden perch

| Golden perch (<i>Macquaria ambigua</i>) | |
|---|--|
| Distribution | Golden perch are found west of the Great Dividing Range throughout the Murray–Darling Basin (except in the upper reaches at high elevations), in the Dawson and Fitzroy rivers, and in the internal Lake Eyre and Bulloo River drainage basins. |
| Habitat | <ul style="list-style-type: none"> • Lives in a variety of habitats, but prefers slow-moving, warm, turbid sections of streams • Can also be found in flooded lakes, backwaters and impoundments • Are tolerant of water temperatures between 4 °C and 35 °C, and salinity levels up to 35 parts per thousand |
| Diet | Aquatic insects, macroinvertebrates, macrocrustaceans, microcrustaceans, fish, algae |
| Longevity | 11 years |
| Age (and size) at maturity | <ul style="list-style-type: none"> • Males: 2–3 years (32.5 cm)* • Females: 4 years (39.7 cm)* <p>*can be variable, particularly under drought conditions</p> |
| Spawning season | September–March |
| Spawning cue | Rising water levels, increased daylight |
| Fecundity | 300 000 – 500 000 |
| Threats | Habitat degradation due to weirs, altered natural flows, barriers to movement, introduced fish, loss of hydraulic diversity |

There are three genetically distinct stocks of golden perch in Queensland. Care must be taken to ensure that golden perch from one river system are not used in stocking programs for another river system. Most golden perch that are stocked outside their natural range in coastal catchments are sourced from Murray–Darling stock.

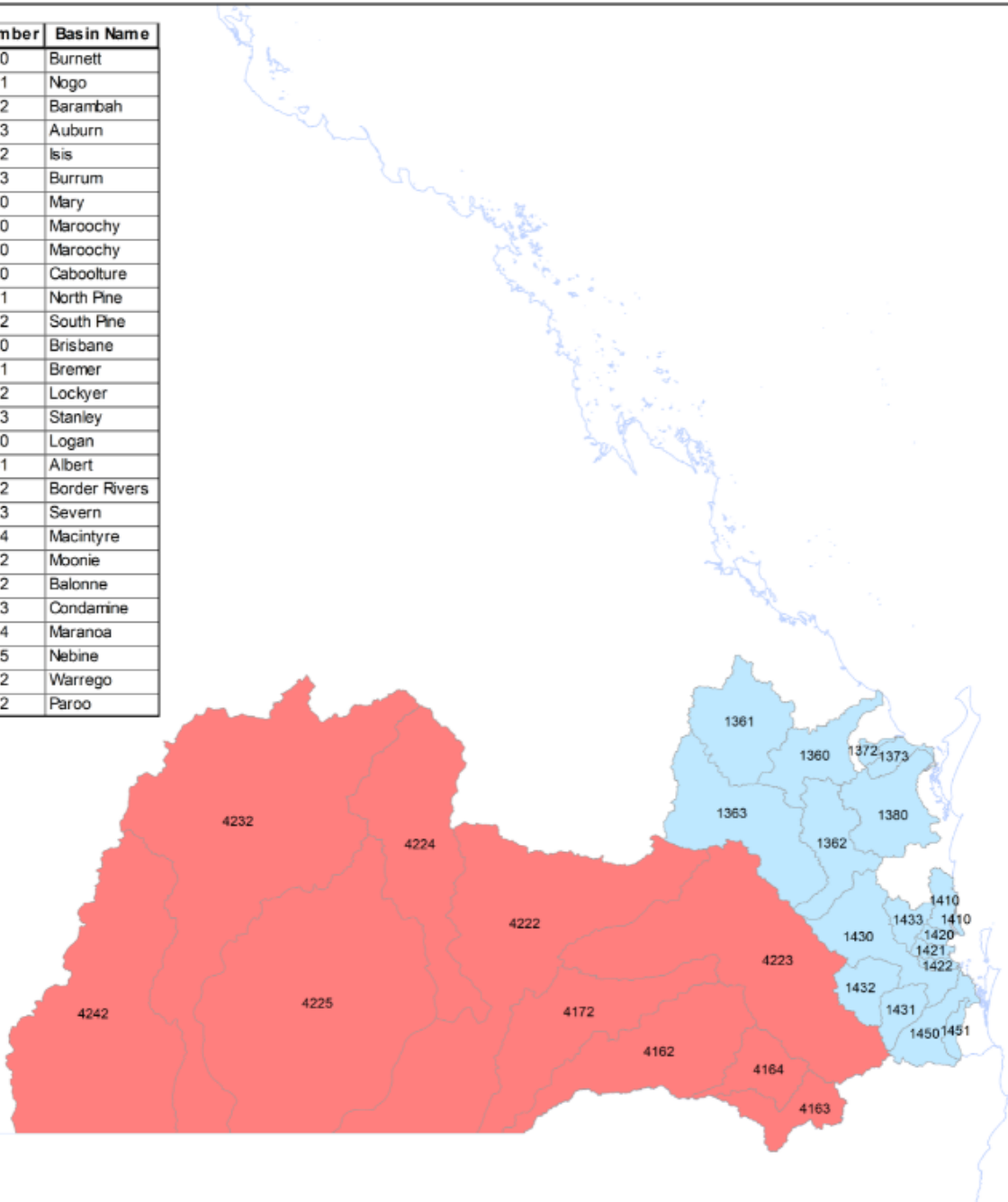
- Lake Eyre drainage (*Macquaria sp.*)—Barcoo, Cooper, Diamantina, Georgina, Mulligan, Thomson
- Murray–Darling (*M. ambigua ambigua*)—Albert, Auburn, Balonne, Barambah, Border Rivers, Bremer, Brisbane, Burnett, Burrum, Caboolture, Condamine, Lockyer, Logan, Macintyre, Maranoa, Maroochy, Mary, Moonie, Nebine, Nogo, North Pine, Paroo, Severn, Southcoast, South Pine, Stanley, Warrego
- east coast Dawson drainage (*M. ambigua oriens*)—Comet, Dawson, Fitzroy, Isaac, Mackenzie, Nogoa.

Golden perch are the most stocked native fish species in Australia, accounting for just over 50 per cent of fish stocking for recreational purposes in northern and eastern Australia (Simpson et al. 2002). They are a popular target species for angling in impoundments and rivers, as they readily take artificial lures and baits and are considered a good table fish.

Golden perch are a solitary species. Although this species reproduces and spends all of its life cycle in fresh water, golden perch will not usually spawn in impoundments.

Golden Perch - Murray-Darling stock

| Number | Basin Name |
|--------|---------------|
| 1360 | Burnett |
| 1361 | Nogo |
| 1362 | Barambah |
| 1363 | Auburn |
| 1372 | Isis |
| 1373 | Burrum |
| 1380 | Mary |
| 1410 | Maroochy |
| 1410 | Maroochy |
| 1420 | Caboolture |
| 1421 | North Pine |
| 1422 | South Pine |
| 1430 | Brisbane |
| 1431 | Bremer |
| 1432 | Lockyer |
| 1433 | Stanley |
| 1450 | Logan |
| 1451 | Albert |
| 4162 | Border Rivers |
| 4163 | Severn |
| 4164 | Macintyre |
| 4172 | Moonie |
| 4222 | Balonne |
| 4223 | Condamine |
| 4224 | Maranoa |
| 4225 | Nebine |
| 4232 | Warrego |
| 4242 | Paroo |



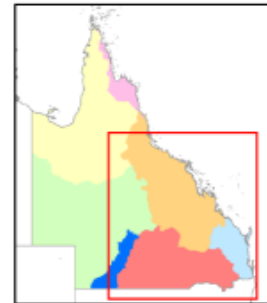
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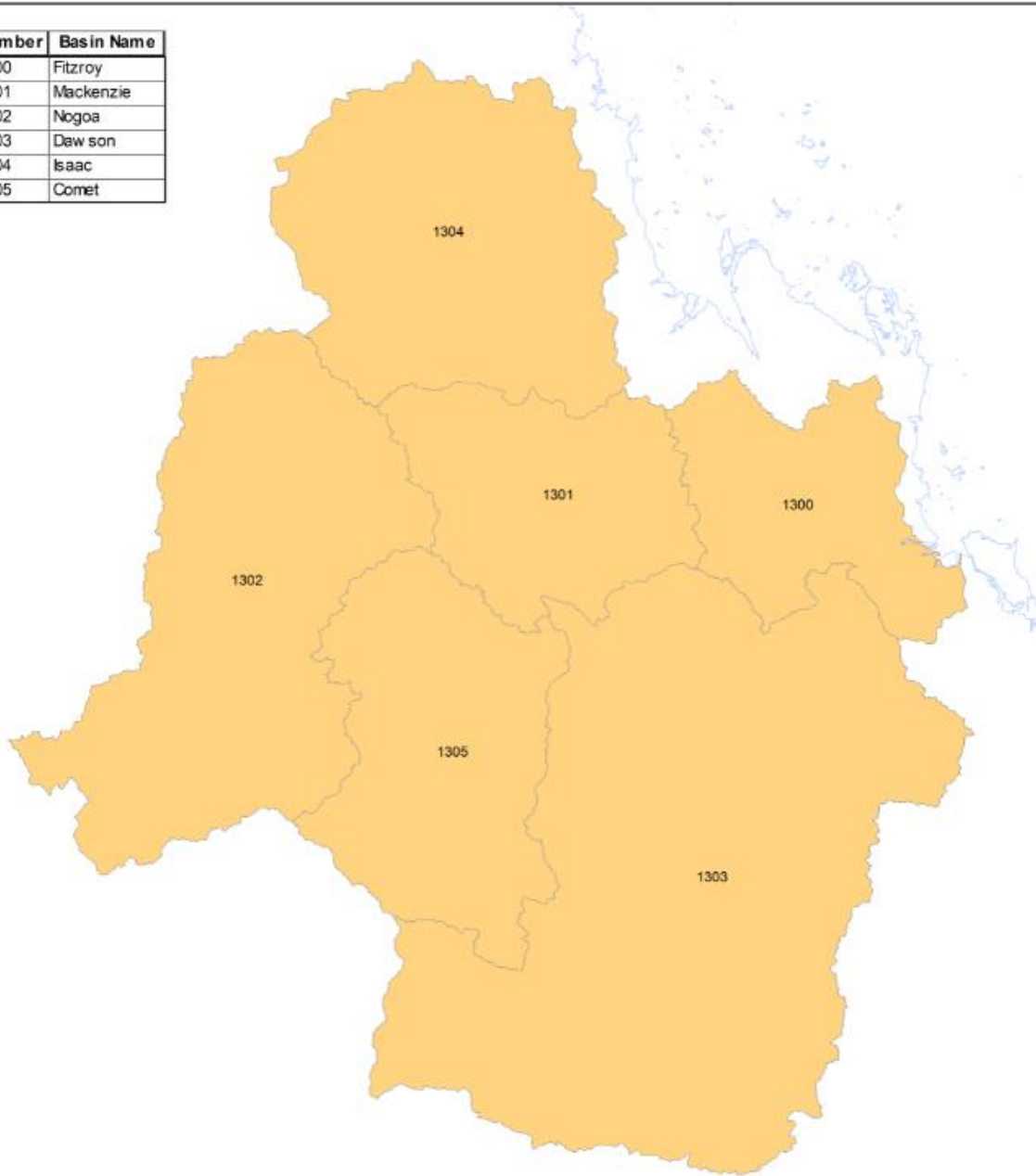
- River Basins
- Basin Group**
- Bulloo/Bancarnia
- East Coast Central
- East Coast North
- East Coast South
- Gulf of Carpentaria
- Lake Eyre
- Murray-Darling



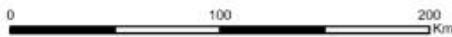
Map 11: Catchments in which golden perch (Murray–Darling stock) can be stocked

Golden Perch - East coast Dawson stock

| Number | Basin Name |
|--------|------------|
| 1300 | Fitzroy |
| 1301 | Mackenzie |
| 1302 | Nogoa |
| 1303 | Dawson |
| 1304 | Isaac |
| 1305 | Comet |



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Legend

River Basins

Basin Group

- Bulloo/Barramie
- East Coast Central
- East Coast North
- East Coast South
- Gulf of Carpentaria
- Lake Eyre
- Murray Darling



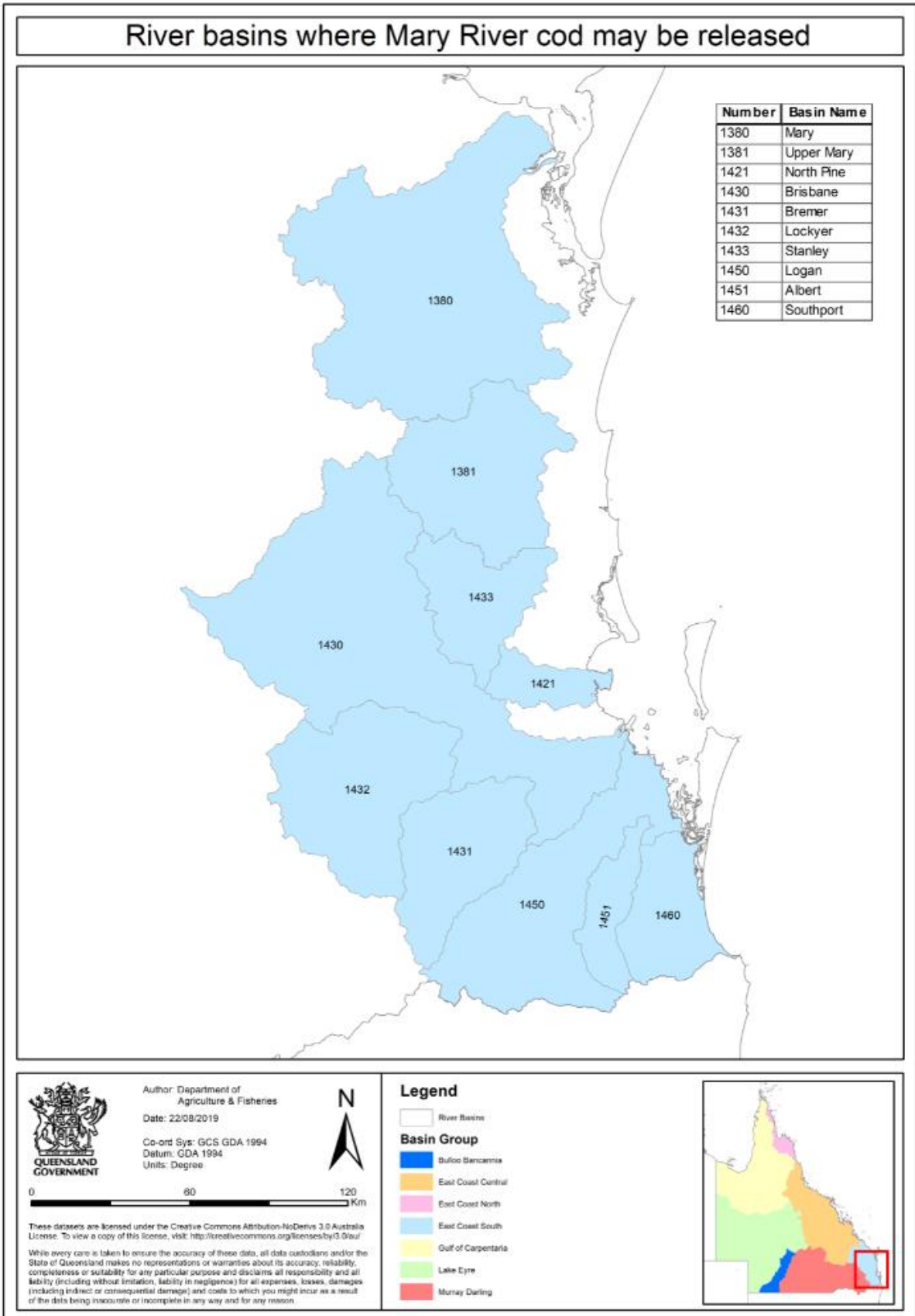
Map 12: Catchments in which golden perch (east coast Dawson stock) can be stocked

Mary River cod

| Mary River cod (<i>Maccullochella peelii mariensis</i>) | |
|---|--|
| Distribution | Naturally found in a few tributaries of the Mary River system |
| Habitat | <ul style="list-style-type: none"> • Occur in a variety of types of habitat in the Mary River system, from high gradient upland rocky streams to large slow-flowing pools in lowland areas • Their ideal habitat appears to be deep, shaded, slow-flowing pools with muddy substrates, woody debris and overhanging vegetation • Cod are caught in water that ranges from 0.8 m to 3.4 m in depth |
| Diet | Crustaceans, fish, frogs, snakes, waterbirds, mice |
| Longevity | Unknown, but thought to be similar to Murray cod |
| Age (and size) at maturity | 30 cm |
| Spawning season | Spring |
| Spawning cue | Water temperature rises above 20 °C |
| Fecundity | 2000 eggs per kilogram of mature female |
| Threats | Water infrastructure, competition with other cod populations |

Numbers of Mary River cod are very low in the wild. They are listed as endangered under the EPBC Act. A recovery plan has been introduced that includes the protection and rehabilitation of remaining habitat, improvement of hatchery-rearing techniques, research to determine specific habitat requirements and regulatory measures to protect the remaining populations from over-exploitation.

This species has been widely stocked into south-eastern Queensland dams and rivers from the Mary River in the north to Hinze Dam in the south. Fingerlings are only available for stocking through commercial hatchery operators. Mary River cod complete their entire life cycle in fresh water and are therefore capable of spawning in impoundments, although it is unknown whether the larvae and juveniles survive.



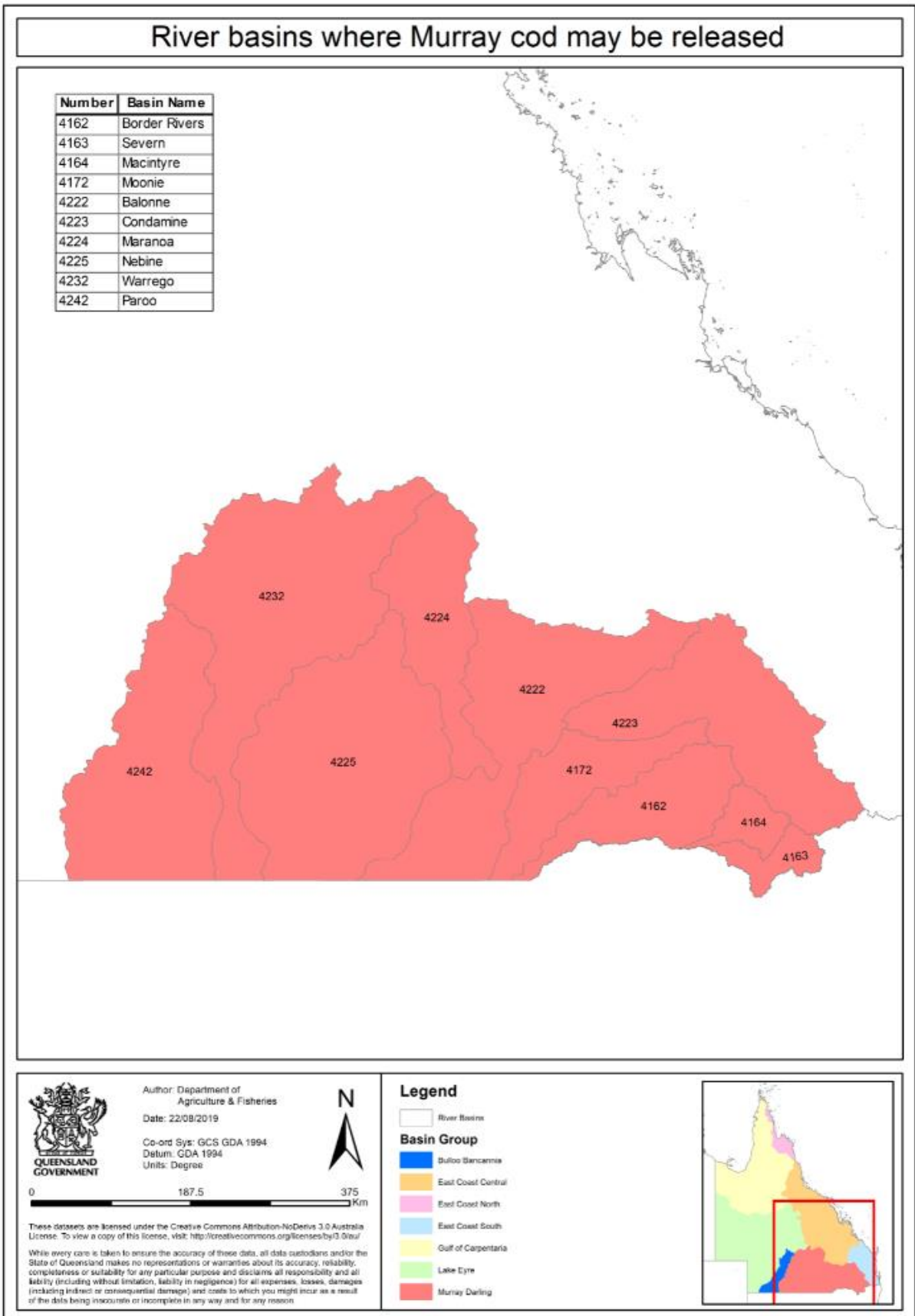
Map 13: Catchments in which Mary River cod can be stocked

Murray cod

| Murray cod (<i>Maccullochella peelii peelii</i>) | |
|--|--|
| Distribution | Murray cod occur in the Murray–Darling river system, west of the Great Dividing Range |
| Habitat | <ul style="list-style-type: none"> • Slow-flowing, turbid waters of low elevation rivers and streams • Also found in fast-moving, clear rocky upland streams • Often found in deeper water around boulders, logs, undercut banks and overhanging vegetation |
| Diet | Crustaceans, fish, molluscs, turtles and small terrestrial animals such as birds, mammals and snakes |
| Longevity | 60 years |
| Age (and size) at maturity | 5–6 years (40–50 cm) |
| Spawning season | Spring – early summer |
| Spawning cue | Annual flooding |
| Fecundity | Data scarce, 22 kg Murray cod has 90 000 eggs |
| Threats | Modifications to riverine environment |

Murray cod have been stocked within their natural distribution. Translocations have also occurred in Boondooma Dam (Burnett catchment), Fairbairn Dam (Fitzroy–Dawson catchment) and Longreach (Lake Eyre). Due to the predatory nature of this species, previous stockings outside its natural range are considered inappropriate and are no longer permitted.

Murray cod are capable of spawning in impoundments; however, levels of recruitment are unknown. Murray Cod are considered vulnerable under the EPBC Act.



Map 14: Catchments in which Mary River cod can be stocked

Northern saratoga

| Northern saratoga (<i>Scleropages jardini</i>) | |
|--|--|
| Distribution | <ul style="list-style-type: none"> Patchy distribution across northern Australia west of the Great Dividing Range and a few scattered locations on Cape York Peninsula, including the Olive, Pascoe and Lockhart rivers, Harmer Creek and an unnamed lake in the Shelburne Bay area Northern saratoga have a minimum water temperature tolerance of 15 °C. |
| Habitat | Commonly near the surface of slow-flowing sections of streams with overhanging vegetation or billabongs |
| Diet | Terrestrial and aquatic insects, crustaceans, small fish, plant material |
| Longevity | 6–7 years |
| Age (and size) at maturity | 48–49 cm |
| Spawning season | September–November |
| Spawning cue | Water temperature approaches 30 °C |
| Fecundity | 30–130 |
| Threats | Unknown, some threat from recreational fishing |

Natural populations of northern saratoga are found in the northern Queensland river systems from the Jardine River and south throughout the Gulf of Carpentaria. Hatchery-reared fingerlings have been stocked into Eungella Dam, Tinaroo Falls Dam, Lake Julius and Moondarra Dam.

Northern saratoga are suspected to reproduce in impoundments; however, stocked species are rarely recaptured. It is unknown whether saratoga require certain conditions to reproduce or if fecundity is very low, thus hindering the establishment of self-sustaining populations.

Redclaw crayfish

| Redclaw crayfish (<i>Cherax quadricarinatus</i>) | |
|--|--|
| Distribution | Rivers systems of Queensland and Northern Territory that drain into the Gulf of Carpentaria, and a few northern east coast rivers on Cape York |
| Habitat | Found in a variety of habitats from shallow, clear, rocky creeks to deep, turbid, slow-moving waters with overhanging vegetation |
| Diet | Decaying plant and animal matter |
| Longevity | 5 years |
| Age (and size) at maturity | 1 year: 50–100 g |
| Spawning season | Spring–summer |
| Spawning cue | Water temperature and day length |
| Fecundity | 100–1000 eggs per female |
| Threats | Seasonal flooding and drying of habitat cause population sizes to vary dramatically |

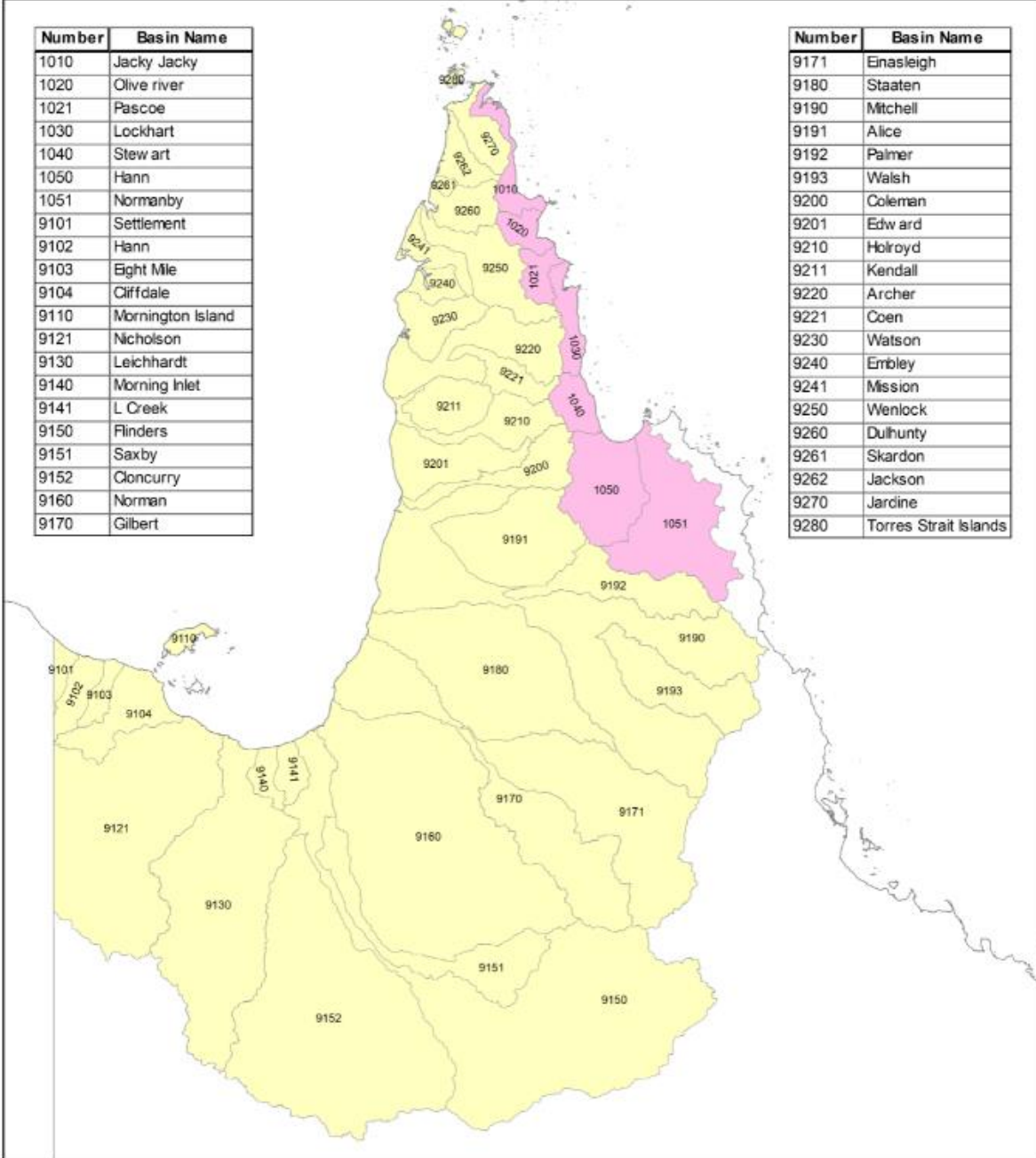
Redclaw have been stocked in Tinaroo Falls Dam in the past under a general fisheries permit. Several populations have flourished through the illegal introduction of redclaw into impoundments outside their natural range (Maroon, North Pine, Wivenhoe, Awoonga, Fairbairn, Mt Morgan, Burdekin Falls, Theresa Creek, Koombooloomba and Peter Faust dams).

Illegal stocking of redclaw has also seen them introduced into the Lake Eyre Basin, where they are now considered to be a significant threat to local crayfish species. Occasional records have been reported from the Murray Darling Basin.

River basins where redclaw crayfish may be released

| Number | Basin Name |
|--------|-------------------|
| 1010 | Jacky Jacky |
| 1020 | Olive river |
| 1021 | Pascoe |
| 1030 | Lockhart |
| 1040 | Stew art |
| 1050 | Hann |
| 1051 | Normanby |
| 9101 | Settlement |
| 9102 | Hann |
| 9103 | Eight Mile |
| 9104 | Cliffdale |
| 9110 | Mornington Island |
| 9121 | Nicholson |
| 9130 | Leichhardt |
| 9140 | Morning Inlet |
| 9141 | L Creek |
| 9150 | Flinders |
| 9151 | Saxby |
| 9152 | Cloncurry |
| 9160 | Norman |
| 9170 | Gilbert |

| Number | Basin Name |
|--------|-----------------------|
| 9171 | Einasleyh |
| 9180 | Staaten |
| 9190 | Mitchell |
| 9191 | Alice |
| 9192 | Palmer |
| 9193 | Walsh |
| 9200 | Coleman |
| 9201 | Edw ard |
| 9210 | Holroyd |
| 9211 | Kendall |
| 9220 | Archer |
| 9221 | Coen |
| 9230 | Watson |
| 9240 | Embley |
| 9241 | Mission |
| 9250 | Wenlock |
| 9260 | Dulhunty |
| 9261 | Skardon |
| 9262 | Jackson |
| 9270 | Jardine |
| 9280 | Torres Strait Islands |





Author: Department of Agriculture & Fisheries
Date: 22/08/2019
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Datum: GDA 1994
Units: Degree



0 220 440 Km

Legend

□ River Basins

Basin Group

- Bulloo/Barnaclea
- East Coast Central
- East Coast North
- East Coast South
- Gulf of Carpentaria
- Lake Eyre
- Murray Darling



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Map 15: Catchments in which redclaw can be stocked

Silver perch

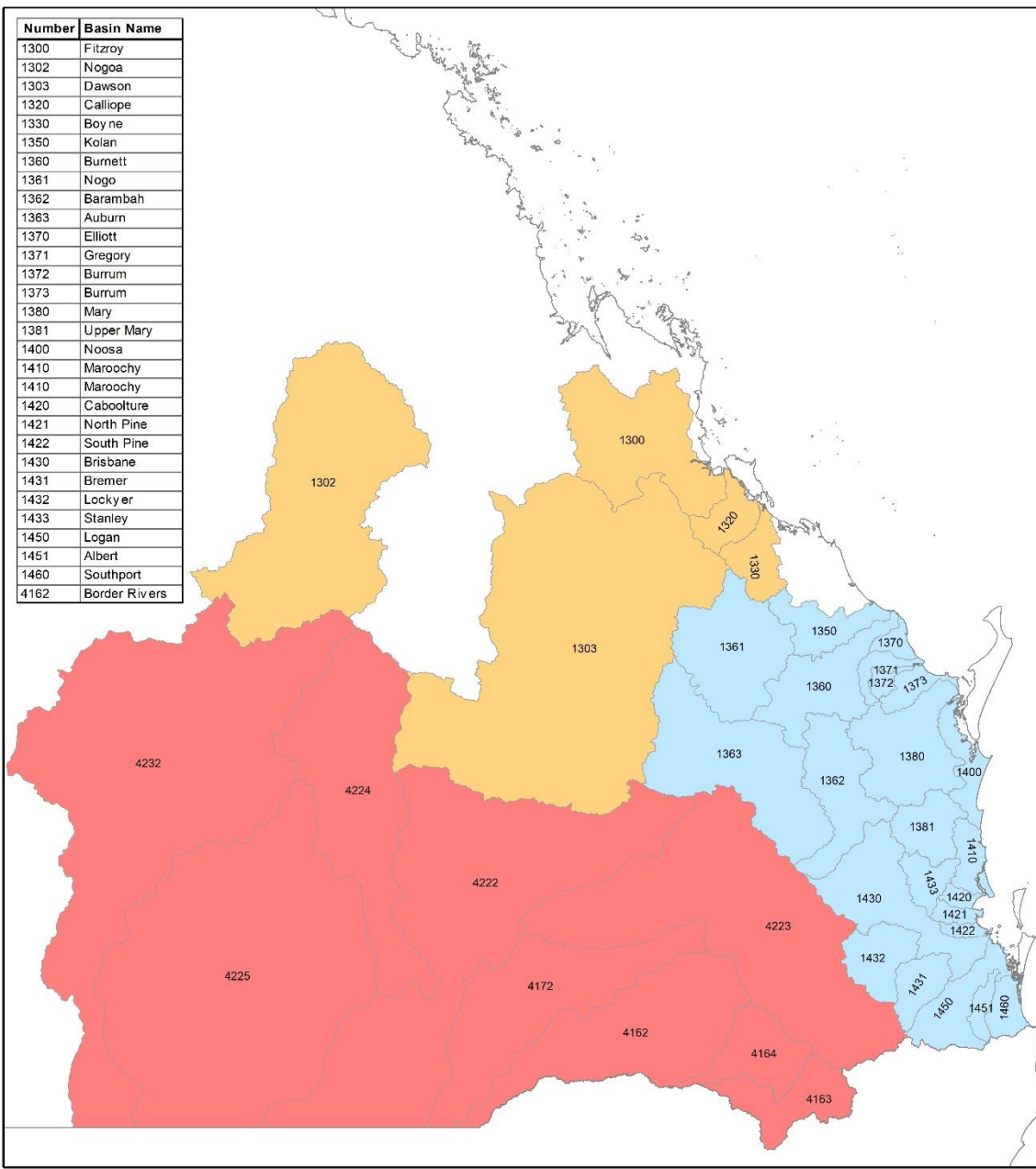
| Silver perch (<i>Bidyanus bidyanus</i>) | |
|---|---|
| Distribution | Silver perch occur naturally throughout the Murray–Darling system |
| Habitat | Rivers, lakes and reservoirs, prefers areas of rapid flow |
| Diet | Insects, molluscs, annelid worms and algae |
| Longevity | At least 26 years |
| Age (and size) at maturity | 2–3 years |
| Spawning season | November–January |
| Spawning cue | Water temperatures rise above 23 °C, flooding |
| Fecundity | 500 000 eggs per 1.8 kg |
| Threats | Water infrastructure |


Silver perch numbers are low and the species is considered critically endangered under the EPBC Act. Hatchery-reared fingerlings have been stocked in the Murray–Darling catchment and in impoundments east of the Great Dividing Range and north to the Fitzroy–Dawson catchment.

Silver perch are the second-most stocked species in Australia. Recreational catches of this species from stocked impoundments has been variable, juveniles are commonly caught on lures or baits, and catchability often decreases with the age of the fish (it is thought that this is because larger fish become predominantly vegetarian). Silver perch will not reproduce in impoundments.


River basins where silver perch may be released

| Number | Basin Name |
|--------|---------------|
| 1300 | Fitzroy |
| 1302 | Nogoa |
| 1303 | Dawson |
| 1320 | Calliope |
| 1330 | Boyne |
| 1350 | Kolan |
| 1360 | Burnett |
| 1361 | Nogo |
| 1362 | Barambah |
| 1363 | Auburn |
| 1370 | Elliott |
| 1371 | Gregory |
| 1372 | Burru |
| 1373 | Burru |
| 1380 | Mary |
| 1381 | Upper Mary |
| 1400 | Noosa |
| 1410 | Maroochy |
| 1410 | Maroochy |
| 1420 | Caboolture |
| 1421 | North Pine |
| 1422 | South Pine |
| 1430 | Brisbane |
| 1431 | Bremer |
| 1432 | Lockyer |
| 1433 | Stanley |
| 1450 | Logan |
| 1451 | Albert |
| 1460 | Southport |
| 4162 | Border Rivers |





Author: Department of Agriculture & Fisheries
Date: 22/08/2019
Co-ord Sys: GCS GDA 1994
Datum: GDA 1994
Units: Degree

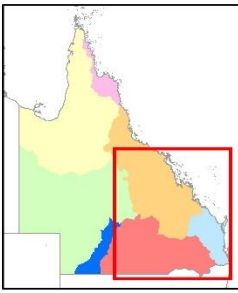


Legend

□ River Basins

Basin Group

- Bulloo Bancannia
- East Coast Central
- East Coast North
- East Coast South
- Gulf of Carpentaria
- Lake Eyre
- Murray Darling



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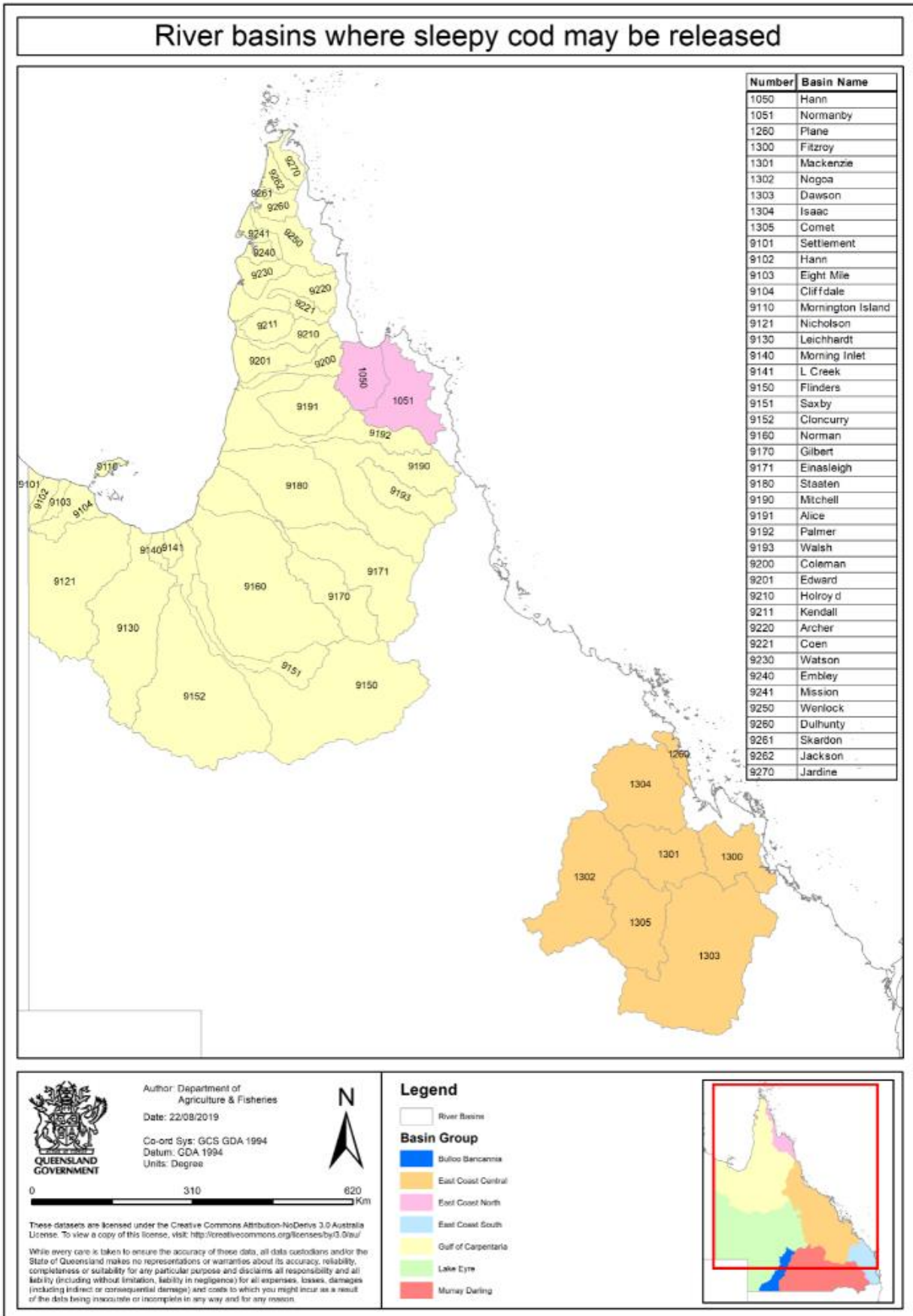
Map 16: Catchments in which silver perch can be stocked

Sleepy cod

| Sleepy cod (<i>Oxyeleotris lineolatus</i>) | |
|--|--|
| Distribution | Native to the coastal rivers north of the Fitzroy River and throughout the Gulf of Carpentaria |
| Habitat | Sleepy cod have an affinity for, and need of, instream cover such as woody debris, aquatic vegetation and root cover |
| Diet | Aquatic insects, macroinvertebrates, molluscs, fish, terrestrial vertebrates, fish, microcrustaceans |
| Longevity | Probably 5–7 years |
| Age (and size) at maturity | <ul style="list-style-type: none">• Age unknown• Females: 28.5 cm• Males: 33 cm |
| Spawning season | October–February |
| Spawning cue | Increased water temperatures above 24 °C and rainfall |
| Fecundity | Average 100 000 |
| Threats | De-snagging, altered environmental flows, disease (tropical epizootic ulcerative syndrome) |

Hatchery-reared sleepy cod fingerlings have been stocked into a number of northern impoundments and rivers, and have established reproducing populations. Illegal stockings of sleepy cod in the Burnett River and Bjelke-Petersen Dam have also resulted in a reproducing population. Sleepy cod will reproduce in impoundments.

Striped sleepy cod are native to Gulf of Carpentaria catchments. They have been translocated or were already present in Gulf impoundments, where they have subsequently flourished. Movement of individuals between two populations is discouraged.



Map 17: Catchments in which the different genetic strains of sleepy cod can be stocked

Snubnose garfish

| Snubnose garfish (<i>Arramphus sclerolepis</i>) | |
|---|---|
| Distribution | Snubnose garfish occur naturally in coastal estuaries throughout Queensland |
| Habitat | Lower rivers reaches, though can be found up to 150km up stream |
| Diet | Filamentous algae, insect larvae |
| Longevity | Unknown |
| Age (and size) at maturity | 21.5–22.5 cm |
| Spawning season | Summer |
| Spawning cue | Surface water temperatures reaching 28 °C |
| Fecundity | Unknown |
| Threats | Barriers to movement, increased water turbidity |

Snubnose garfish are not available from commercial hatcheries, and have not been stocked in the past. Some stocking groups are permitted to collect wild stocks of garfish to transfer to other waterbodies.

Snubnose garfish are known to reproduce in southern impoundments and are stocked as a food fish for larger predatory species and a recreational species. Great care must be taken to ensure that stocks are not translocated to inappropriate catchments.

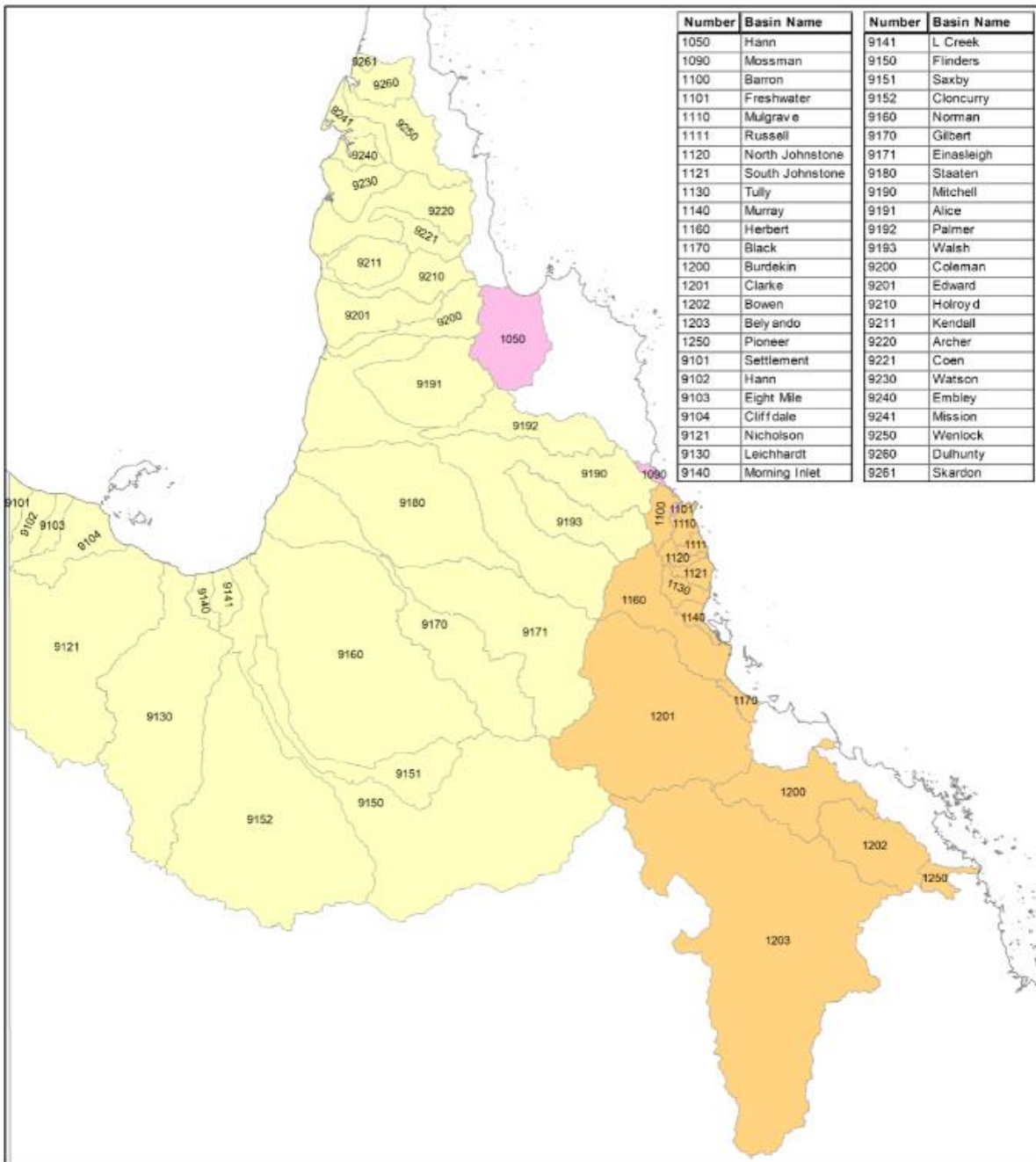
Snubnose gar are able to reproduce in fresh water and a single release of several hundred garfish has led to a large population in North Pine, Cressbrook, Cania and Somerset dams and Cassava Lagoon. This practice is unlikely to continue to be supported.

Sooty grunter

| Sooty grunter (<i>Hephaestus fuliginosus</i>) | |
|--|---|
| Distribution | <ul style="list-style-type: none">• Sooty grunter occur naturally in the coastal rivers north of the Burdekin River, in the Gulf of Carpentaria and west to the Daly River in the Northern Territory• There is some anecdotal evidence that populations in Lake Julius are endemic |
| Habitat | Large flowing streams over sandy or rocky bottoms with sparse aquatic plant growth |
| Diet | Algae, aquatic insects, aquatic macrophytes, molluscs, macroinvertebrates, crustaceans |
| Longevity | 5–7 years |
| Age (and size) at maturity | <ul style="list-style-type: none">• 6–8 months• Males: 5–6 cm• Females: 8–9 cm |
| Spawning season | November–March |
| Spawning cue | Increased temperature and water levels |
| Fecundity | 177 000 per kilogram of mature female |
| Threats | Over-exploitation, water infrastructure, habitat alteration |

Hatchery-reared sooty grunter fingerlings have been stocked into many northern Queensland dams, which has resulted in successful fisheries. Self-sustaining populations have developed in some impoundments and rivers outside natural distribution, including Koombooloomba Dam, Lake Julius and Burdekin Falls Dam. However, most stocking does not result in self-sustaining populations. Sooty grunter will reproduce in impoundments that have suitable inflowing streams.

River basins where sooty grunter may be released



Author: Department of Agriculture & Fisheries
 Date: 22/09/2019
 Co-ord Sys: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



0 240 480 Km

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Legend

- River Basins
- Basin Group**
- Bulloo/Bancannia
- East Coast Central
- East Coast North
- East Coast South
- Gulf of Carpentaria
- Lake Eyre
- Murray Darling



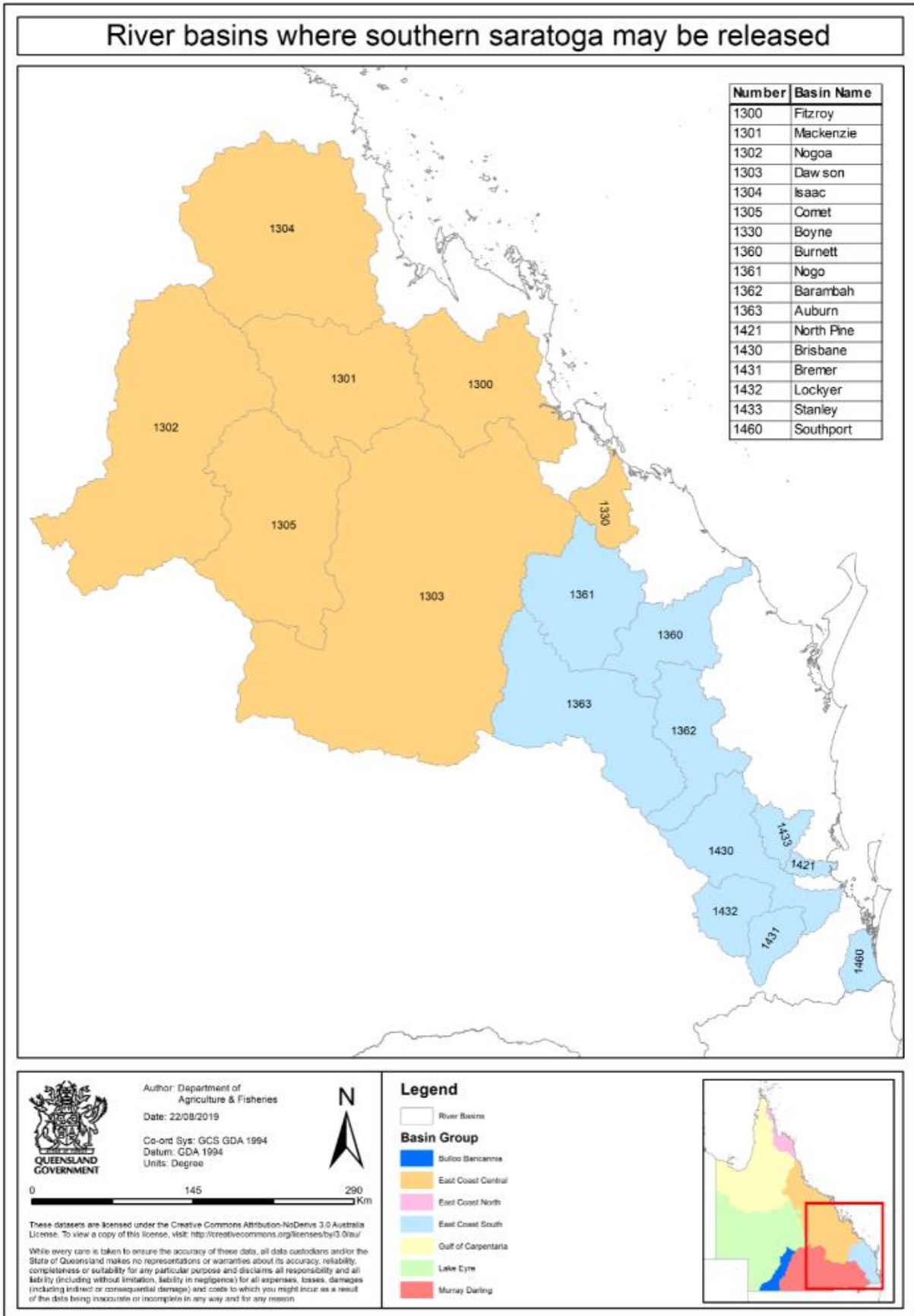
Map 18: Catchments in which sooty grunter can be stocked

Southern saratoga

| Southern saratoga (<i>Scleropages leichardti</i>) | |
|---|--|
| Distribution | The natural distribution of southern saratoga is limited to the Fitzroy–Dawson catchment in central Queensland |
| Habitat | Turbid billabongs or large pools in slow-flowing streams |
| Diet | Insects, crustaceans, frogs, fish |
| Longevity | At least 7 years |
| Age (and size) at maturity | 4–5 years (36 cm) |
| Spawning season | October–November |
| Spawning cue | Water temperature |
| Fecundity | 30–130 |
| Threats | Water regulation, lack of knowledge, delayed maturity and reduced fecundity |

In the late 1980s, limited numbers of southern saratoga were introduced to most impoundments east of the Great Dividing Range and south of the Fitzroy–Dawson catchment to Hinze Dam and north to Peter Faust Dam.

Southern saratoga are known to reproduce in some impoundments and have formed self-sustaining populations in Borumba Dam, Hinze Dam, Cania Dam and Lake MacDonald.



Map 19: Catchments in which southern saratoga can be stocked—please note that southern saratoga are no longer allowed to be stocked in the Mary River catchment

Appendix 2: New fish species considered for trial stocking

Jungle perch

| Jungle perch (<i>Kuhlia rupestris</i>) | |
|--|---|
| Distribution | Jungle perch occur from the Cape York to Tallebudgera Creek |
| Habitat | <ul style="list-style-type: none"> • Occur in fast-flowing freshwater streams and rivers, usually in rainforest areas and also in estuaries and inshore coastal waters, occasionally recorded from oxbow lakes, prefer clear water streams to tannin-stained streams • Found in altitudes up to 240 metres • Females tend to occupy the lower reaches and the males occupy the upper reaches of the river with the males moving downstream to females during breeding season |
| Diet | Small fish, terrestrial and aquatic insects, crustaceans and fruits that fall from overhead trees |
| Longevity | At least 13 years—some captive specimens exceeded this age |
| Age (and size) at maturity | <ul style="list-style-type: none"> • 2–4 years (generally 2 years for captive specimens) • Males: 18–21 cm fork length • Females: 21–23 cm fork length • Males grow slower than females and have a smaller maximum size—maximum male size is 32 cm fork length (1 kg), maximum female size is 52 cm fork length (4 kg) |
| Spawning season | November–April |
| Spawning cue | <ul style="list-style-type: none"> • Migrate to salt water to spawn • Southern fish require full salinity sea water |
| Fecundity | 200 000 to over 1 million eggs per spawn (varying with size of fish) |
| Threats | Barriers to fish passage, clearing of riparian zone, reduced flows and siltation |

Jungle perch have a gradual shift in genetics from north to south, with the northern (Cairns) and southern (Fraser Island) strains being distinct and individuals from central Queensland (Mackay) being a mix of both strains. Only small remnant populations remain on the mainland south of Mackay. Significant research over the past decade has been undertaken to develop knowledge to successfully breed jungle perch.

Fisheries Queensland will work with stocking groups to develop a number of trial stockings in small impoundments within the historical range of the species (i.e. up to 200 km upstream of the tidal limit and not upstream of natural barriers such as waterfalls). These trials will require a dedicated monitoring plan as set out in section 9.4. When the species is proven to be suitable for stocking as a recreational species, consideration will be given to a wider stocking program.

Mangrove jack

| Mangrove jack (<i>Lutjanus argentimaculatus</i>) | |
|--|---|
| Distribution | Mangrove jack occur in all Queensland waters, including the lower reaches of freshwater streams |
| Habitat | <ul style="list-style-type: none">• Occur in a variety of habitat types, including deeper reef areas, mangrove estuaries and freshwater streams.• Are associated with complex structural habitat in rivers |
| Diet | Fish, crabs, prawns and insects |
| Longevity | Greater than 50 years |
| Age (and size) at maturity | <ul style="list-style-type: none">• Males: 7 years (45 cm)• Females: 8 years (51 cm) |
| Spawning season | October–March |
| Spawning cue | Lunar cycle |
| Fecundity | 526 000 eggs per kilogram of mature female |
| Threats | Overfishing, habitat destruction |

Mangrove jack are a popular recreational saltwater and freshwater species. They spend their juvenile phase in fresh water and migrate to salt water to spawn. Loss of habitat and barriers to movement have reduced the numbers of mangrove jack in freshwater systems. In 1998 and 1999, stocking was first officially trialled in Lake Morris near Cairns to determine survival and growth potential. Following this trial, Awoonga Dam (Gladstone) and Lake Tinaroo (Atherton) were stocked and an additional trial was undertaken in Aplin Weir (Townsville).

Fisheries Queensland is moving towards further stocking trials on a case-by-case basis—in the lower reaches of freshwater systems (up to 30 km above tidal limits, including in dams where the foot of the dam wall is no more than 100 m above sea level) in the Gulf of Carpentaria and east coast drainage divisions. These trials will require a dedicated monitoring plan as set out in section 9.4.

Sea mullet

| Sea mullet (<i>Mugil cephalus</i>) | |
|--------------------------------------|---|
| Distribution | Sea mullet occur in coastal and fresh waters throughout Queensland |
| Habitat | Coastal, estuarine, and fresh waters |
| Diet | Detritus, phytoplankton and zooplankton |
| Longevity | 16 years |
| Age (and size) at maturity | <ul style="list-style-type: none">• 3-4 years• Males: 30 cm• Females: 33 cm |
| Spawning season | Winter |
| Spawning cue | Unknown, may be triggered by offshore winds |
| Fecundity | Up to 4.8 million |
| Threats | Overfishing, waterway barriers, river regulation |

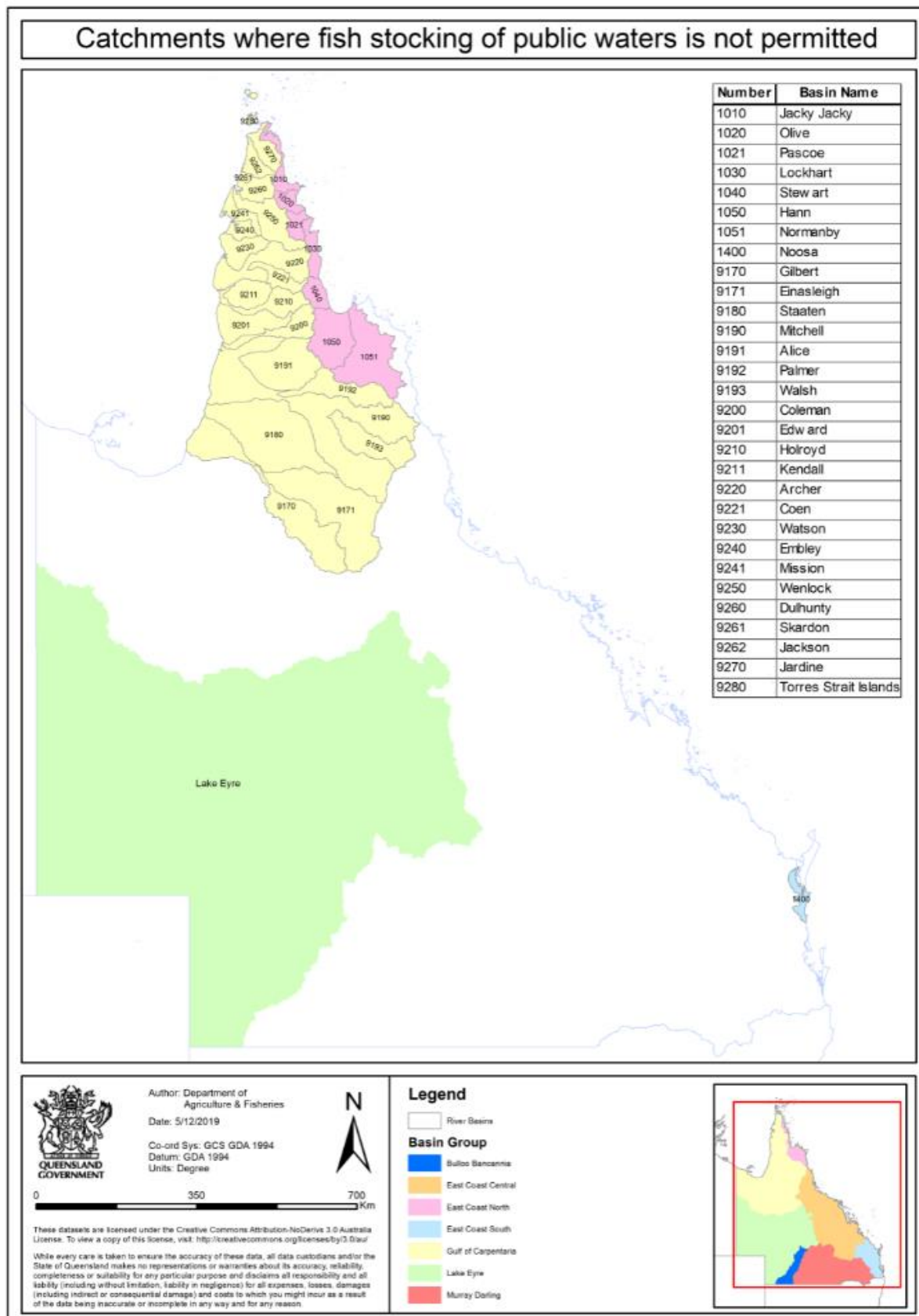
Sea mullet were once common in freshwater streams throughout coastal Queensland and could be found significant distances (100 km) upstream. They prefer slow-flowing habitat and will generally not enter small fast-flowing tributaries (Pusey, Kennard & Arthington 2004).

Sea mullet migrate from fresh to salt water to spawn and can undertake this journey many times in their life cycle. The introduction of waterway barriers has severely limited the upstream distribution of this species and its ability to complete its life cycle.

Sea mullet have consistently been released in Lake Awoonga (Gladstone) since 1999. Results indicate that the species have become well established in the dam and upstream river systems, however, they appear to prefer the dam environment. They have also been stocked into the Caboolture River to undertake bioremediation activities.

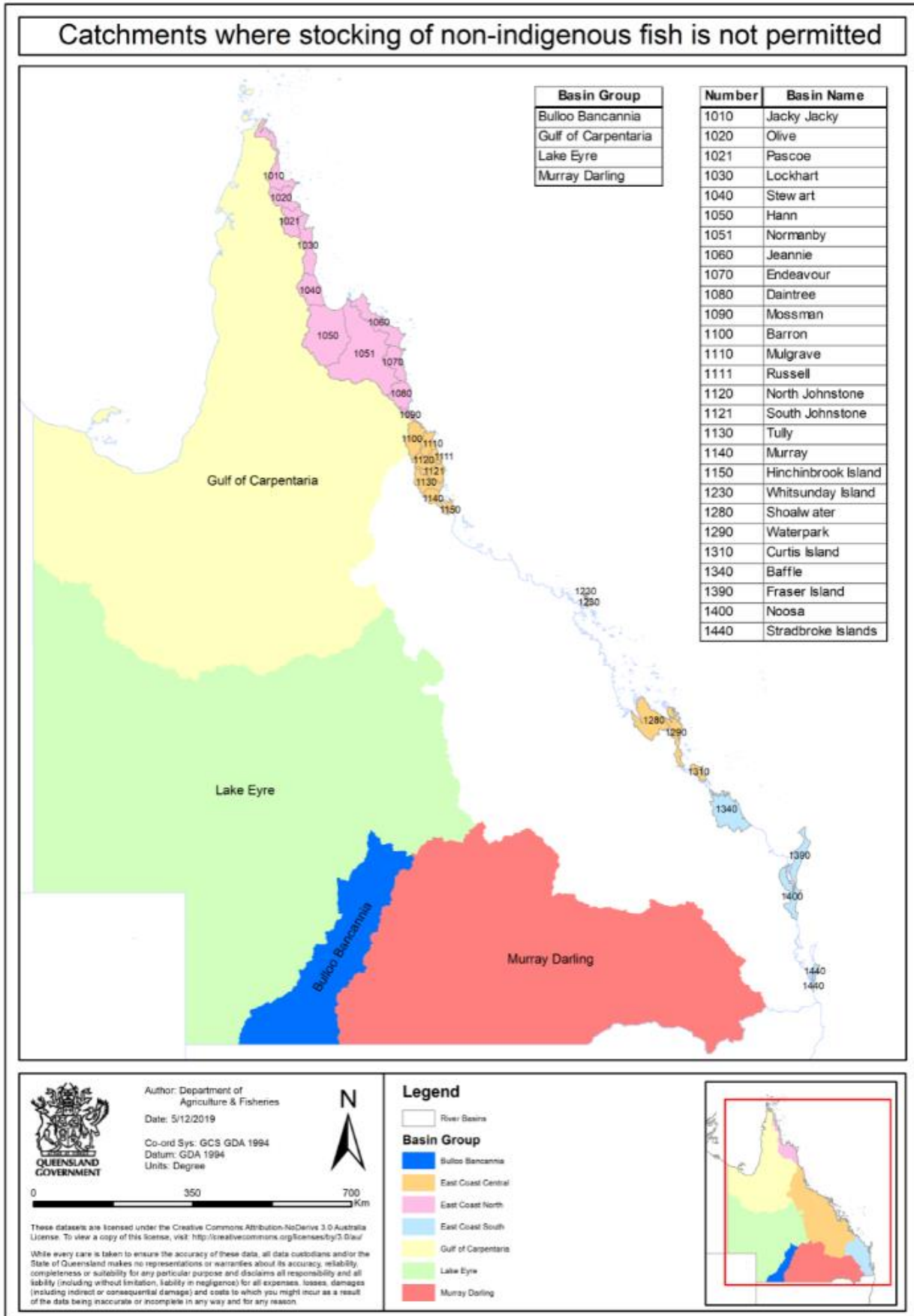
Fisheries Queensland is moving towards further stocking trials on a case-by-case basis—in the lower and mid reaches of freshwater systems (200–300 km upstream of the tidal limit and below natural barriers such as waterfalls) in the east coast drainage divisions. These trials will require a dedicated monitoring plan as set out in section 9.4.

Appendix 3: Prohibited stocking of public waters for recreational fishing



Map 20: Areas and catchments in which fish stocking of public waters for recreational fishing is not permitted

Appendix 4: Prohibited translocations of non-indigenous fish



Map 21: Areas and catchments in which translocations of non-indigenous fish is not permitted

Appendix 5: Fish movement information

Some native fish move long distances at certain times of the year as part of the breeding cycle. When stocked into an artificial impoundment, these riverine fish retain their instinctive movement patterns and may try to migrate upstream or downstream out of the impoundment. The movement of key Queensland native fish is provided below.

| Species | Type of movement | Timing | Habitat |
|--------------------|---|--|--|
| Australian bass | Adults move from river to estuary to spawn | May–Aug | Coastal rivers, lakes, estuaries |
| | Juveniles and adults move upstream for dispersal and summer feeding | Sept–Dec | |
| Barramundi | Adults move from river to sea to spawn | Sep–Jan | Rivers, swamps, lagoons, storages, upstream as far as major waterfalls |
| | Juveniles move from sea to river for dispersal, food and growth | Sep–Mar | |
| Eel-tailed catfish | Move, but reasons for movement unknown | Possibly following flow events | More abundant in lakes |
| Golden perch | Adults move in early spring/summer flow pulses for spawning. Has been recorded moving over thousands of kilometres. | On rising temperatures and following large flow events Sep–May | Warmer, turbid, sluggish streams or lakes |
| | Juveniles drift/move downstream on flows. | | |
| Jungle perch | Adults move to salt water to spawn and return to freshwater, Juveniles may also migrate to salt water during the same period. | Nov–May | Freshwater streams and rivers and also in estuaries and inshore coastal waters |
| Mangrove jack | Adults move from river to sea to spawn | Sep–Mar | Offshore reefs, rivers, swamps, lagoons, storages, upstream as far as major waterfalls |
| | Juveniles move from sea to river for dispersal, food and growth | Nov–Apr | |
| Mary River cod | Move within fresh water for habitat/dispersal, probably similar to Murray cod | Unknown—may be similar to Murray cod | Variety of habitats |
| Murray cod | Adults move up and downstream within fresh water for spawning then return to their previous position. May move considerable distances of 10 to 100 of kilometres | Sep–Nov | Areas with cover and snags, undercut banks, prefer deep holes |

| Species | Type of movement | Timing | Habitat |
|-------------------|--|---------------------|---|
| Northern saratoga | Unknown, thought to be local movement (appear not to move great distances) | Unknown | Clear streams, fast-flowing waters and billabongs |
| Sea mullet | Adults move from river to sea to spawn | Jun–Aug | Variety of habitats from offshore to upstream freshwater habitats |
| | Juveniles move from sea to river for dispersal, food and growth | Jun–Sep | |
| Silver perch | Adults move upstream in response to increased temperature in late winter/spring and spawn on flows. Silver perch have been recorded moving well over one thousand kilometres | Sep–Jan | Fast-flowing waters, especially rapids |
| | Juveniles move upstream for dispersal into tributaries on flows | Throughout the year | |
| Sleepy cod | Juveniles move upstream | Nov–May | Weedy, slow-flowing areas with snags and logs |
| Snubnose garfish | Moves into fresh water to breed in weed beds Can complete life history in fresh water | Sep–Apr | Swim near surface, require weedy areas to spawn, also found over shallow sandy areas in current |
| Sooty grunter | Adults move upstream to spawn in rapids | Aug–Feb | Varied environments, offstream lagoon, most abundant fish in upstream reaches of many rivers |
| | Juveniles move upstream and over flooded plains for dispersal | Dec–Apr | |
| Southern saratoga | Unknown | Unknown | Long deep turbid waterholes with overhanging vegetation and abundant snags |

Appendix 6: Risk assessment matrix

The risk assessment matrix is described in the tables below.

Table A1: Definition of consequence levels for the impact of stocking on receiving ecosystems

| Level | Score | Environmental consequence |
|--------------|-------|---|
| Minor | 0 | Short-term localised impacts, rapid recovery |
| Moderate | 1 | Incidental changes to biomass/biota in affected area, insignificant changes to ecosystem function |
| Severe | 2 | Impact will cause a detectable effect on local ecosystems |
| Major | 3 | Significant effect on local ecosystems, recovery measured in years to decades |
| Catastrophic | 4 | Large-scale detrimental effects, highly significant effects on local ecosystems |

Table A2: Definition of likelihood of occurrence

| Level | Score | Descriptor |
|------------|-------|--|
| Remote | 1 | Never heard of but not impossible |
| Rare | 2 | May occur in exceptional circumstances |
| Unlikely | 3 | Uncommon but could occur at some time |
| Possible | 4 | Evidence suggests that it is possible |
| Occasional | 5 | May occur |
| Likely | 6 | Is expected to occur |

Table A3: Risk evaluation matrix

| | | Consequence | | | | | |
|------------|------------|-------------|----------|--------|-------|--------------|----|
| | | Minor | Moderate | Severe | Major | Catastrophic | |
| | | 0 | 1 | 2 | 3 | 4 | |
| Likelihood | Remote | 1 | 0 | 1 | 2 | 3 | 4 |
| | Rare | 2 | 0 | 2 | 4 | 6 | 8 |
| | Unlikely | 3 | 0 | 3 | 6 | 9 | 12 |
| | Possible | 4 | 0 | 4 | 8 | 12 | 16 |
| | Occasional | 5 | 0 | 5 | 10 | 15 | 20 |
| | Likely | 6 | 0 | 6 | 12 | 18 | 24 |

Table A4: Risk ranking definitions and consequences

| Risk | Ranking | Consequence |
|-------------|---------|---|
| Low risk | 0–3 | Activity may be supported |
| Medium risk | 4–9 | Activity may be supported on a trial basis subject to monitoring and review |
| High risk | 10–24 | Activity not supported |