



# Queensland Crocodile Management Plan

Revised draft for consultation

Prepared by: Wildlife and Threatened Species Operations, Department of Environment, Science and Innovation.

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## Objectives

The Queensland Crocodile Management Plan (the QCMP) is the overarching framework for managing public safety and protecting estuarine crocodiles in the wild.

The objectives of the QCMP are to:

- ensure an evidence-based approach to conserving estuarine crocodiles while increasing public safety
- provide a consistent approach to crocodile management for Queensland
- outline the risks posed by crocodiles in Queensland
- define and explain each of the crocodile management zones and how the Queensland Government manages crocodiles in each zone.

## Introduction

Estuarine crocodiles (*Crocodylus porosus*) are a protected species in Queensland, listed as a vulnerable species under the *Nature Conservation Act 1992* (the NC Act) (Qld). They are also protected nationally under Commonwealth legislation and internationally under the Convention on the International Trade of Endangered Species (CITES). These arrangements affect how crocodiles are managed, farmed and traded.

Crocodiles also are culturally significant for many First Nations peoples across Queensland.

The QCMP supports the Nature Conservation (Estuarine Crocodile) Conservation Plan 2018 (Qld) (the conservation plan), which is made under the NC Act. Together these documents describe the strategic management framework to reduce risks to public safety and protect crocodiles in the wild.

As estuarine crocodiles pose a significantly higher risk to humans than freshwater crocodiles (*Crocodylus johnstoni*), the QCMP is focused on the management of public safety risks associated with estuarine crocodiles.

The QCMP is informed by the findings of key monitoring and research work undertaken by the Queensland Government, including the Queensland Estuarine Crocodile Monitoring Program, to inform updates to the crocodile management zones.

This revised version of the QCMP:

- provides clearer information on the management response for each of the crocodile management zones and outlines the process for how each of the zones was determined
- outlines the shortcomings of commonly proposed alternative management responses to reduce the risk of crocodile attacks in Queensland
- provides an avenue for the community to provide input to the QCMP to help inform future iterations of the QCMP.

## Habitat, distribution and behaviour

Estuarine crocodiles range from India, throughout south-east Asia and Papua New Guinea to northern Australia, and across to the Solomon Islands and as far east as Vanuatu.

In Queensland they are known to occur throughout the Gulf of Carpentaria, Cape York Peninsula, Torres Strait, and along the east coast of Queensland down to Rockhampton, which has the southern-most population.

Crocodiles are rarely present south of the Fitzroy River, and only in very low numbers. This area where they occur is referred to as crocodile country (Croc Country).

The estuarine crocodile population in Queensland is estimated to be between 20,000–30,000 non-hatchlings.

They are primarily riverine (found on or near the banks of a river), with 90% of the population existing in areas less than 20m above sea level.

Estuarine crocodiles are also found in tidal reaches of rivers and associated inlets and wetlands, as well as along beaches and offshore islands in the Great Barrier Reef and Torres Strait, and in freshwater lagoons, rivers, and swamps up to hundreds of kilometres inland from the coast.

The number and density of estuarine crocodiles are highest in northern Cape York Peninsula, with three crocodiles per kilometre (3.0/km), and decline southward, with 1.2 crocodiles per kilometre (1.2/km) in the Gulf of Carpentaria and the Cairns region, down to 0.2 crocodiles per kilometre (0.2/km) in the Fitzroy River, Rockhampton.

Estuarine crocodiles are capable of long-distance movements, up to several hundred kilometres, along the coast and up and down rivers. As a result, there is a possibility that crocodiles may be present in any water body (saltwater and freshwater) north from Gladstone, all the way to the Northern Territory border.

Estuarine crocodiles are semi-aquatic, opportunistic, apex predators that feed on a wide range of prey. Juvenile estuarine crocodiles feed on small insects, crabs, prawns and shrimps. As they grow, so does their range of potential food items. At sizes of around 2m they begin to take an increasing number of vertebrates such as fish, frogs, birds, and rats.

An adult estuarine crocodile, which can reach lengths of over 5m, may prey on sea turtles, goannas, wallabies, cats, pigs, dogs, kangaroos, cattle, horses, buffalo, other crocodiles, and very occasionally, people.

Estuarine crocodiles are water's edge predators that will ambush anything that moves at or near the water's surface. They have very good eyesight, and a well-developed sense of smell which sometimes leads them long distances in search of prey. Their bodies are covered with dermal pressure sensors which can detect the smallest movement of animals or objects in the water.

In comparison, freshwater crocodiles rarely grow more than 2.5m long, have a much narrower snout, and their diet consists of smaller animals (including insects, fish, frogs, lizards, turtles, bats, birds). Because of their smaller size and preference for smaller prey they pose a lower risk to humans than estuarine crocodiles. Freshwater crocodile attacks on humans are very rare and are usually defensive in nature.

## Risks to humans

The predatory response of estuarine crocodiles is based on the detection of movement. Anything that moves on or near the water's surface, including people, will attract a crocodile's attention and may trigger an attack. While the likelihood of being attacked by a crocodile is relatively low the consequence for an individual who is attacked can be severe. Between December 1985—April 2024, 34 non-fatal attacks and 14 fatal attacks by estuarine crocodiles in Queensland have occurred in the wild.

The recovery of the crocodile population since hunting was stopped in the mid-1970s, along with the continuing growth of the human population in North Queensland, means there is an ever-increasing likelihood of contact between people and crocodiles.

Most estuarine crocodile attacks, sightings and captures for management purposes occur on the populated east coast of Queensland, between Ayr and Port Douglas, where higher human populations occur along with relatively high crocodile numbers. In Croc Country, attacks are more likely in waterways that are below 20 metres elevation, where 90% of the crocodile population live.

While all crocodiles are dangerous, some crocodiles can display dangerous behaviours around or towards humans.

A crocodile may be considered as a *crocodile displaying dangerous behaviour* when:

- it has attacked, is about to attack, or is behaving aggressively towards, a person
- its location or behaviour, is a threat, or a potential threat, to the safety or wellbeing of humans
- it develops an association between humans and food availability
- it displays certain territorial behaviours.

Like many risks in the environment, the risk of crocodile attack can be minimised. In Queensland, the QCMP's focus is on the management of crocodiles through selective and targeted removal of crocodiles that pose the greatest risks to public safety by the Queensland Government (or other authorised entities). Other key strategies to significantly minimise the risks posed by crocodiles are:

- installation of warning signs by the Queensland Government
- delivery of an ongoing Be Crocwise public safety campaign through Croc Country
- community members taking personal responsibility for their safety and adopting Be Crocwise behaviours
- scientific research on crocodiles and social research into attitudes, behaviours, and barriers to the uptake of Crocwise behaviours, to inform Be Crocwise messaging
- monitoring the size and density of crocodile populations throughout Croc Country and how these change over time.

## Be Crocwise program

The Queensland Government is committed to reducing the risks to public safety posed by crocodiles.

Regardless of the number of crocodiles that are removed the best way to avoid a crocodile attack is for people to be aware of the risks posed by crocodiles, and for individuals to stay safe when they are in and around waterways in Croc Country.

Information and resources on the Be Crocwise program is available on the [Queensland Government website](#).

## Selective and targeted removal of crocodiles

The conservation plan outlines the limited circumstances under which a crocodile may be considered a *problem crocodile* and therefore targeted for removal from the wild.

These circumstances include where:

- the crocodile has attacked, is about to attack, or is behaving aggressively towards, a person
- the nature of the crocodile's location or behaviour makes the crocodile a threat, or a potential threat, to the safety or wellbeing of humans
- a crocodile has passed over, through or under a crocodile prevention barrier on land, on which aquaculture fisheries resources, stock, or a working dog normally lives and is, or is likely to become, a danger to the resources, stock or dog.

In summary, animal location, animal behaviour and animal size are the key considerations to determine if a crocodile is considered a *problem crocodile*.

A crocodile larger than 2m in length may be considered a *large crocodile*. While most crocodiles can attack humans, *large crocodiles* are more capable of injuring or killing people. Most attacks are carried out by crocodiles larger than 2m.

*Problem crocodiles* are captured through either direct capture (e.g. from a boat) or indirect capture, (e.g. traps), depending on the circumstances as per the methods prescribed in the Australian Code of Practice on the Humane Treatment of Wild and Farmed Australian Crocodiles.

While removal of problem crocodiles is generally led by wildlife officers from the Department of Environment, Science and Innovation (the department), in some circumstances, removals are undertaken or assisted by other trained stakeholders including Indigenous Land and Sea Rangers.

Any capture, handling and transportation of crocodiles authorised by the department is done in accordance with the requirements of the Australian Code of Practice on the Humane Treatment of Wild and Farmed Australian Crocodiles.

## Crocodile management zones

Queensland's management of crocodiles is based on *crocodile management zones*. Different parts of the state are located within different management zones, which are determined by the overall risk to public safety.

Factors used in evaluating the risks to public safety in different parts of the state include:

- the size of the human population in an area
- the size of the crocodile population in an area
- the viability of various management options in an area.

The criteria for determining that a crocodile is a *problem crocodile* are slightly different in each zone, taking into consideration the differing risk factors.

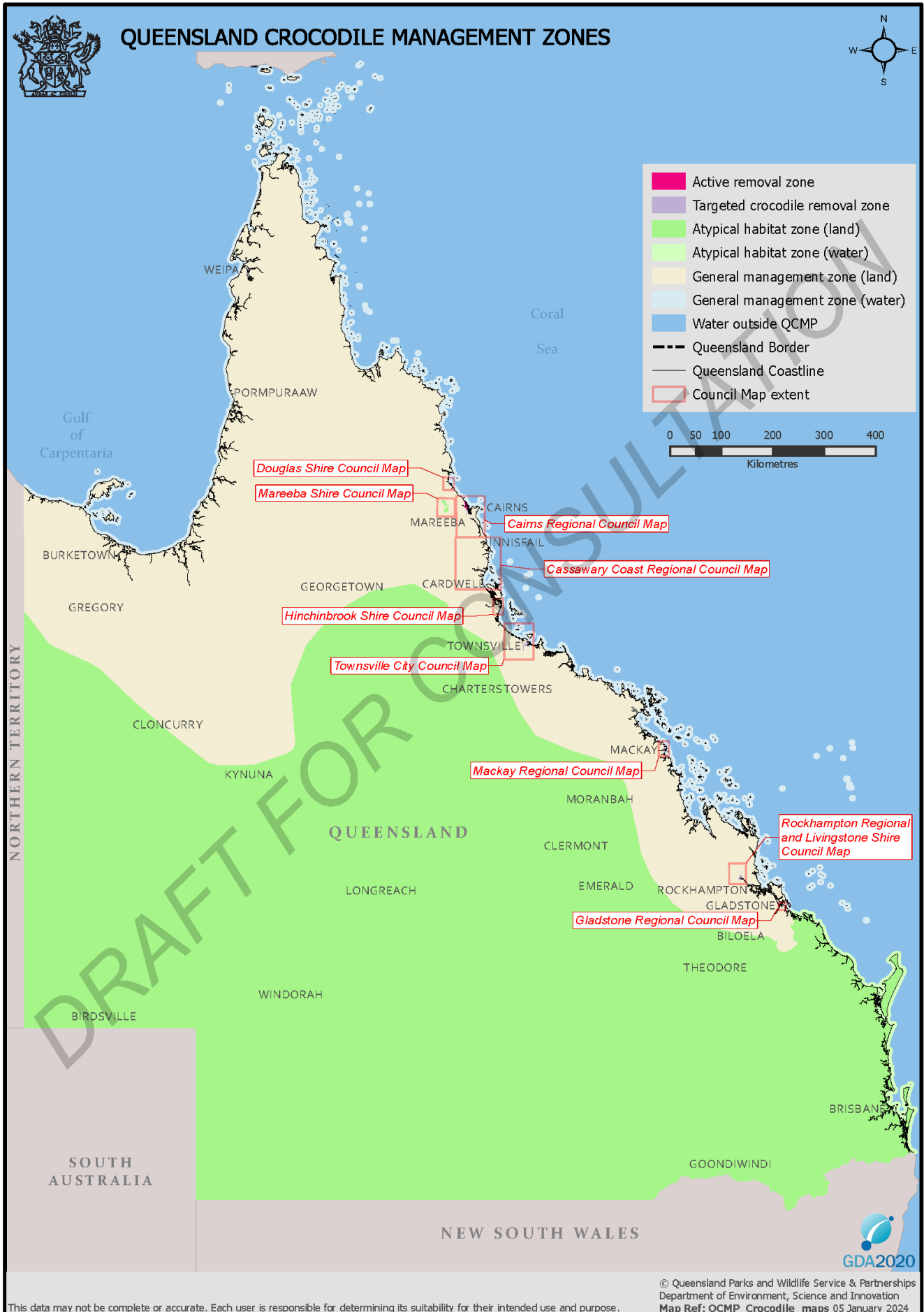
Boundaries for the *crocodile management zones* are determined by the department's Chief Executive, in consultation with stakeholders, with the aim of minimising risks to public safety and ensuring the conservation of crocodiles in the wild.

The crocodile management zones have been consolidated and simplified from Version 1 of the QCMP.

Each area of Queensland is now zoned as one of the following *crocodile management zones*.

- Active removal zone (AR zone)
- Targeted crocodile removal zone (TCR zone)
- General management zone (GM zone)
- Atypical habitat zone (AH zone).

The updated crocodile management zones for Queensland are shown on the map below. Additional zone maps for other areas are available in Appendix B. All updated crocodile zone maps are available on the [department's website](#).



## Active removal zone (AR zone)

An active removal zone (AR zone) applies to areas where the risk of human–crocodile interaction is high—due to the significant number of people living in these areas and high likelihood of crocodiles entering the area from surrounding crocodile habitat.

Management in this zone seeks to significantly reduce the number of estuarine crocodiles near large urban areas and other high use areas.

In AR zones, **all estuarine crocodiles**, regardless of size or behaviour are targeted for removal. The management approach can involve a combination of permanent, regularly monitored traps in some creeks, and patrolling to detect and target crocodiles for removal. Crocodiles are also targeted for removal if a sighting is received from the public.

In some instances, physical barriers (generally existing barriers such as weirs) prevent crocodiles entering the area. All crocodiles reported to have passed these barriers are targeted for immediate removal.

Through these practices the risk of crocodile attack may be mitigated to an extent but cannot be removed entirely.

At any given time, there may be undetected crocodiles within the zone, known crocodiles yet to be removed, or new crocodiles entering the zone. Even when a crocodile has been removed, it leaves a vacated territory for another crocodile to fill.

## Targeted crocodile removal zone (TCR zone)

A targeted crocodile removal zone (TCR zone) applies to areas near urban centres and popular leisure sites where the risk of human–crocodile interaction is high. These zones are frequented by large numbers of people and frequented by estuarine crocodiles. *Large crocodiles* are often likely to be living or transitioning through this zone.

Management in this zone involves targeting the removal of all *large crocodiles* and any *crocodile displaying dangerous behaviour* (following a problem crocodile determination).

Crocodiles identified on beaches are generally transitory rather than resident animals which makes removal of these animals unmanageable unless the animal can be identified as a resident of a waterway located within this zone.

It is not possible, nor the intent of management, to make this zone free of crocodiles. Crocodiles will be present and the chance of attack from a crocodile remains.

The removal of a *large crocodile* or *crocodile displaying dangerous behaviour* may reduce the likelihood of a crocodile attack but also makes space for another crocodile to fill.

## General management zone (GM zone)

A general management zone (GM zone) applies to all areas of Queensland's Croc Country not designated as an AR zone, TCR zone or AH zone.

In this zone, the risk of human–crocodile interaction is variable due to the range of habitats and varying numbers of people found within this zone. Typically, estuarine crocodile habitat in this zone is not located near large urban centres. *Large crocodiles* or *crocodiles displaying dangerous behaviour* may be living within this zone.

Management in this zone involves community education regarding Be Crocwise behaviours and removing *crocodiles displaying dangerous behaviour* (following a *problem crocodile* determination).

While the removal of *crocodiles displaying dangerous behaviour* from this zone reduces the likelihood of attacks from individual crocodiles, the chance of a crocodile attack remains, particularly in areas of high-quality crocodile habitat.

## Atypical habitat zone (AH zone)

An atypical habitat zone (AH zone) applies to the areas of Queensland that are not typical habitat for estuarine crocodiles. Generally, the risk of human–crocodile interaction is very low due to the low likelihood of estuarine crocodiles being present beyond their typical range limit and the targeted removal all crocodiles found in the area.

Management in this zone seeks to keep the area free of crocodiles and involves targeting all crocodiles for removal once their presence has been confirmed.

It is generally unlikely, but still possible, that crocodiles may be present within this zone (e.g. if an animal escapes from a local crocodile captive facility). To minimise the risks to public safety during a period of confirmed crocodile presence, local education and community engagement activities will be undertaken.



## Crocodile rehoming

Generally, estuarine crocodiles removed from the wild are rehomed in zoos or crocodile farms. However, in limited circumstances, where rehoming of the crocodile is impractical and inhumane due to transport from remote locations, the animal may be humanely euthanised as a last resort. Where possible, communications with Traditional Owners occurs early and their input is sought regarding decisions on whether the crocodile should be euthanised.

Captured crocodiles are no longer relocated in the wild in Queensland, due to the capability of the species to travel long distances and their homing ability once relocated.

The government is committed to continue rehome *problem crocodiles* wherever possible and will continue to consult with relevant representatives of the crocodile farming and zoological industries regarding their capacity (and willingness) to accept crocodiles removed from the wild.

## In-situ trials

Recent genetic research on estuarine crocodiles within Queensland shows that, even though they are capable of swimming quite long distances, they tend not to move as far across their range as had been thought. Research shows that most crocodiles within Queensland stay 50km from where they hatched. This lack of dispersal has led to the recognition of 6 distinct sub-populations within the state. Due to the lack of movement between these sub-populations, management arrangements within one sub-population are unlikely to have a significant impact on the other sub-populations.

The Fitzroy River contains the southern-most breeding population of estuarine crocodiles in the world. The system contains low densities of crocodiles, and the local climate plays a major role in slowing growth rates of crocodiles, compared to those animals found closer to the equator. This reduction in physical growth rate appears to translate to a constraint on population growth through delayed maturity and limited reproduction. Given this population's standing on the southern extreme of the species breeding range, the department will conduct animal in-situ trials. These proactive measures intend to support both crocodile management to protect human safety, and crocodile conservation. In-situ management will involve 'aversive' conditioning (such as hazing) trials to change individual crocodile behaviour (increase wariness) or to drive crocodiles upstream in an effort to reduce the incidence of human-crocodile interaction in more urban areas. These trials will be closely evaluated for their effectiveness.

The Proserpine River contains the highest density of large crocodiles in Queensland. To better understand both the environmental conditions and population dynamics at play, the department is engaging in several research projects focussing on the estuarine crocodile population within this system and the surrounding area. Part of this work involves the tracking of individual animal's movements to help determine finer scale dispersal patterns. In combination with state-wide genetic and localised oceanographic studies, this tracking data will help to gain a clearer understanding of how crocodiles move around within this region.

## Other management practices

Management practices including egg harvesting, culling and wild harvesting are not endorsed as practical management solutions under this plan.

The conservation plan does include provisions to authorise the sustainable harvesting of estuarine crocodile eggs under a harvesting licence should certain conditions be met. Due to naturally very high rates of egg mortality for the species, wild harvest of estuarine crocodile eggs has been proven to have no detrimental impact on crocodile populations in both Queensland and the Northern Territory.

Widespread commercial harvest of crocodiles for their skins in Queensland was common practice up until the mid-1970s, when protection measures were introduced. The wild population to that point had been reduced to the extent that it was no longer commercially viable to continue harvesting.

Culling to reduce crocodile populations is viewed as unacceptable by large portions of the community along with the tourism industry which profits from tourists being able to observe crocodiles in the wild. Large-scale culling would also lead to a false sense of safety in and around waterways in Croc Country, while the risk of crocodile attacks would remain.

Harvesting wild crocodile skins is also no longer commercially viable, as the imperfections accrued naturally by animals in the wild compromise the commercial value of the skins to the point where they do not meet strict industry quality standards.

## **Plan review, feedback and updates**

The QCMP will be reviewed every five years to identify areas where management actions can be improved and will incorporate any learnings, findings from scientific research and population changes occurring since the previous update.

It is not proposed for the QCMP to be rewritten should there be changes to legislation and administrative arrangements that do not materially affect the operation of the plan, unless the Chief Executive determines that a new plan is required.

A four (4) week period in September will be provided each year for members of the public to request changes or seek a review of crocodile management zones.

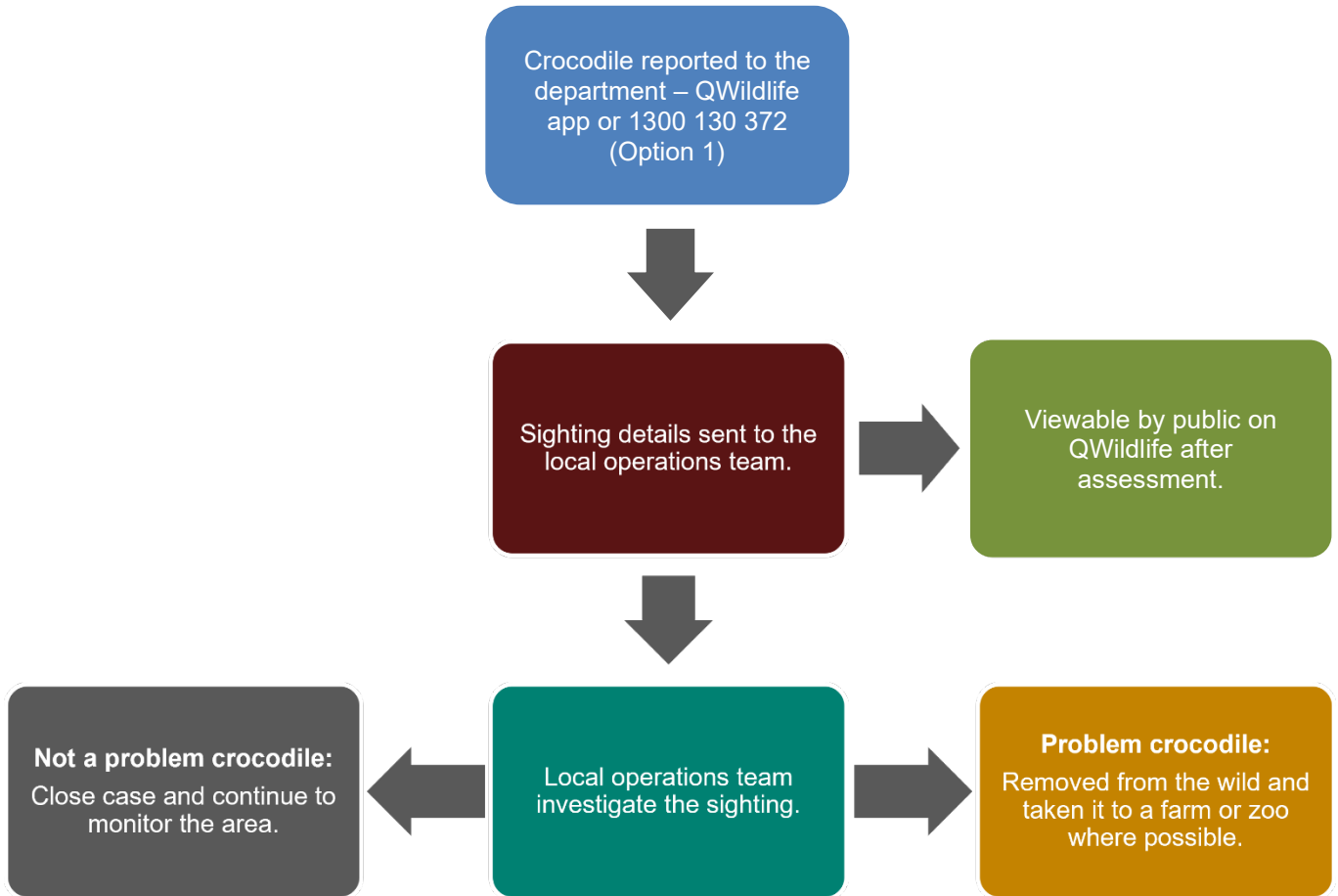
The annual feedback period will direct members of the public to an online request form which once submitted will be considered by the department.

As new verified risks are identified, changes to the location and/or boundaries of the Crocodile management zones will be considered as required, and not be restricted to the 5-year review cycle.

In making decisions about amending a crocodile management zone map, the Chief Executive may consider matters relevant to the conservation of crocodiles as well as matters relevant to overall public safety.

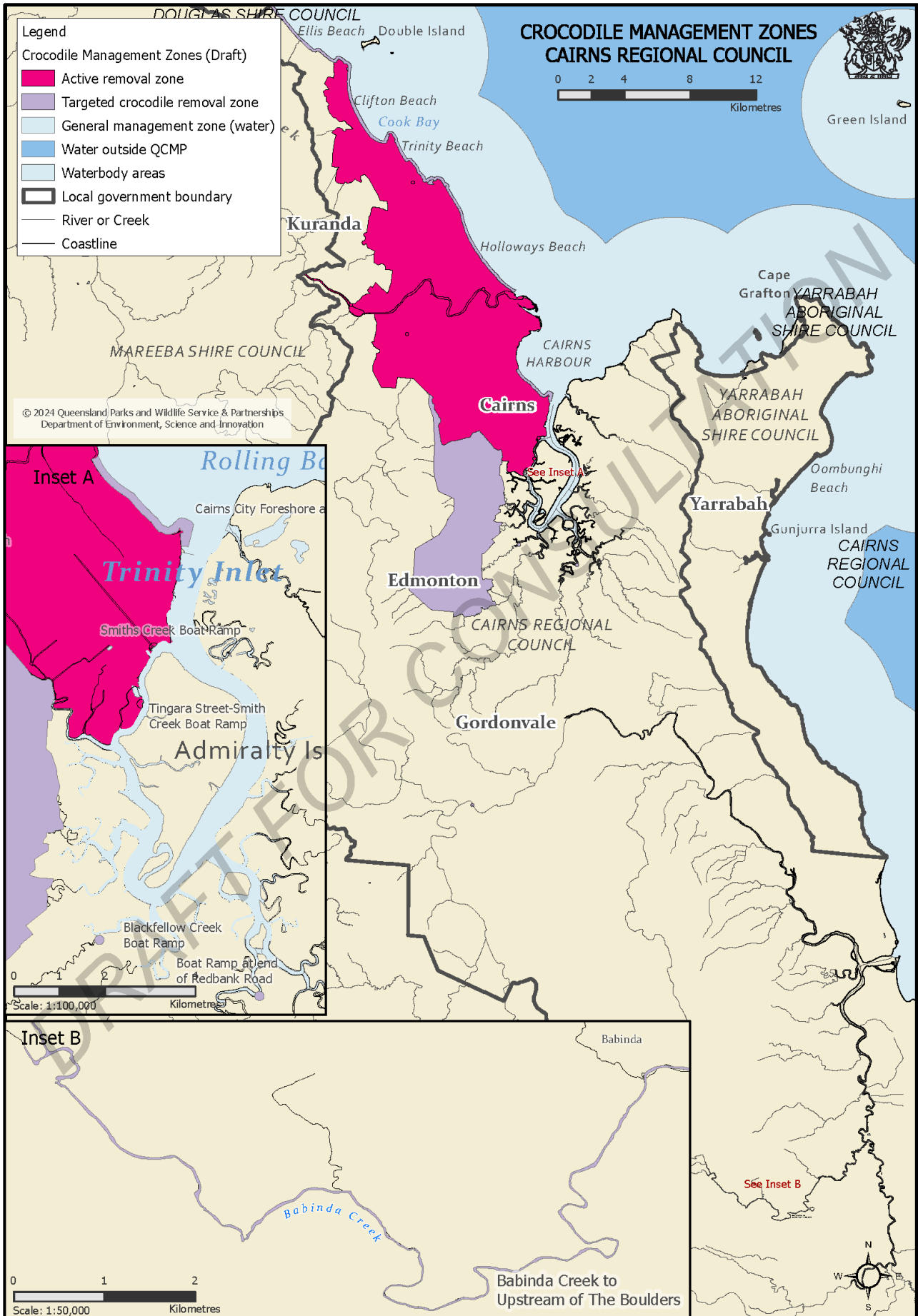
<b>Definitions</b>	
<b>Problem crocodile determination</b>	<p>The process by which crocodile sightings/reports are assessed by the chief executive of the agency administering the <i>Nature Conservation Act 1992</i> to determine if the crocodile should be declared a problem crocodile and targeted for removal from the wild (this process is outlined in Appendix A).</p> <p>While this determination is being made sightings are publicly reported on the QWildlife App as 'sighting under investigation'.</p>
<b>Conservation Plan</b>	The Nature Conservation (Estuarine Crocodile) Conservation Plan 2018.
<b>Croc Country</b>	The coastal areas from the Boyne River near Gladstone to the northern tip of Queensland and west to the Northern Territory border. It can stretch some hundreds of kilometres inland from the coast, while also encompassing many coastal islands.
<b>Crocodile</b>	An animal of the species <i>Crocodylus porosus</i> or <i>Crocodylus johnstoni</i> .
<b>Crocodile management zones</b>	Areas defined by maps referred to in the 'Crocodile management zone' section of this QCMP.
<b>Crocodile displaying dangerous behaviour</b>	A crocodile that has attacked, is about to attack, or is behaving aggressively towards, a person; or a crocodile the chief executive of the agency administering the <i>Nature Conservation Act 1992</i> reasonably believes, due to its location or behaviour, is a threat, or a potential threat, to the safety or wellbeing of humans.
<b>Estuarine crocodile</b>	An animal of the species <i>Crocodylus porosus</i> .
<b>Large crocodile</b>	A crocodile that is two metres or greater in length.
<b>NC Act</b>	The <i>Nature Conservation Act 1992</i>
<b>Problem crocodile</b>	A crocodile that the chief executive of the agency administering the <i>Nature Conservation Act 1992</i> determines satisfies the definition in section 5 of the Nature Conservation (Estuarine Crocodile) Conservation Plan 2018, as further detailed in the 'Crocodile removal' section of this QCMP, and in accordance with the problem crocodile determination procedure (Appendix A).
<b>QCMP</b>	The Queensland Crocodile Management Plan.

## Appendix A – Problem crocodile determination procedure

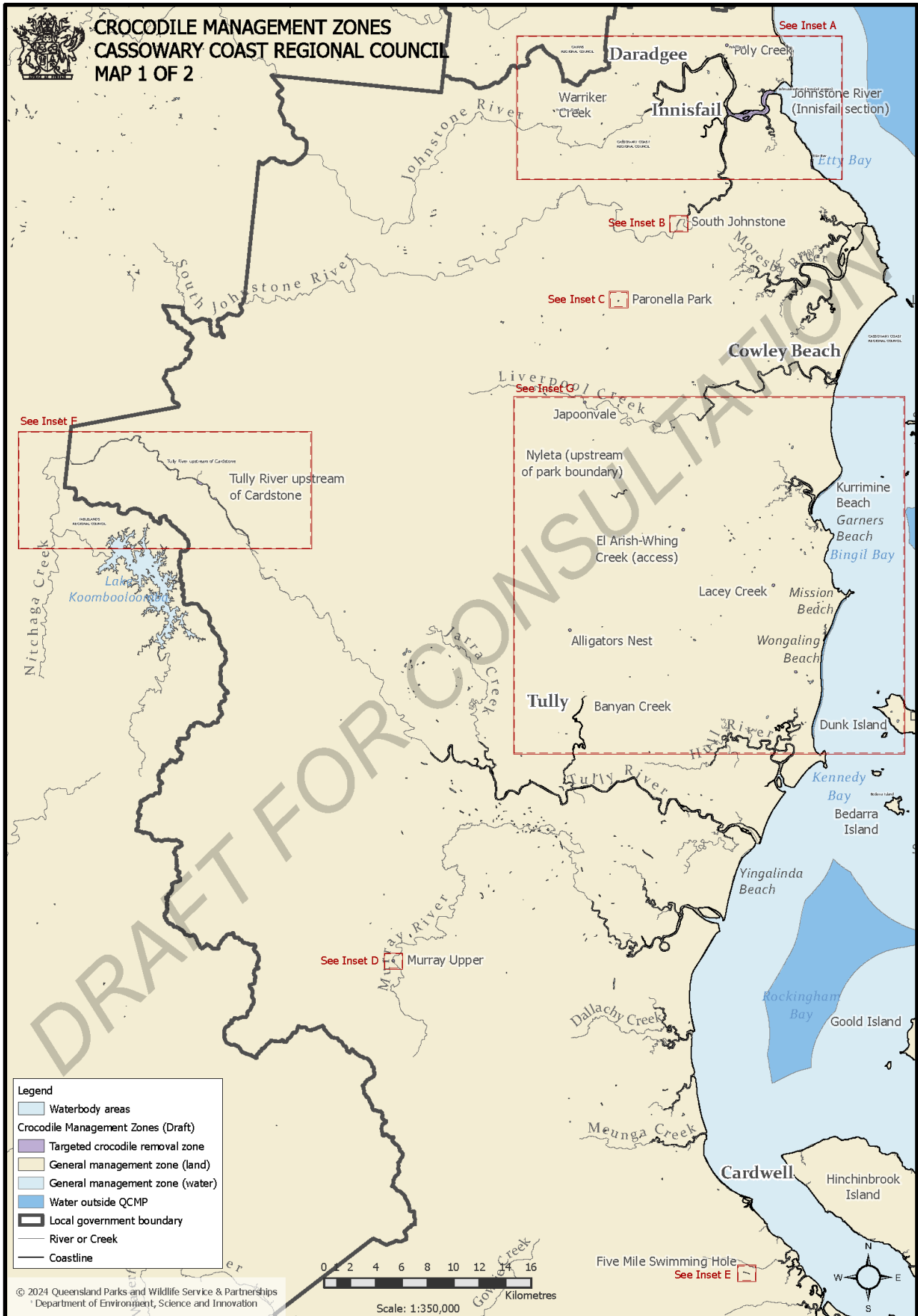


## **Appendix B – Crocodile management zones maps for Queensland**

Cairns Regional Council map

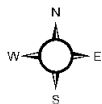
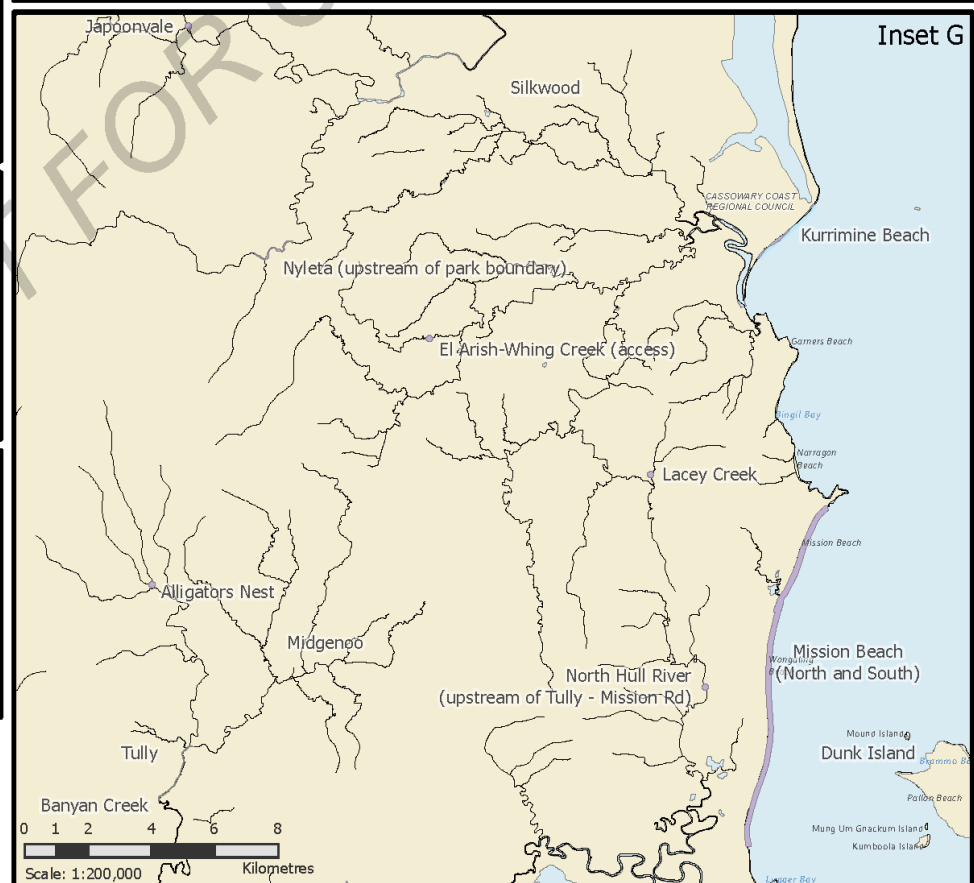
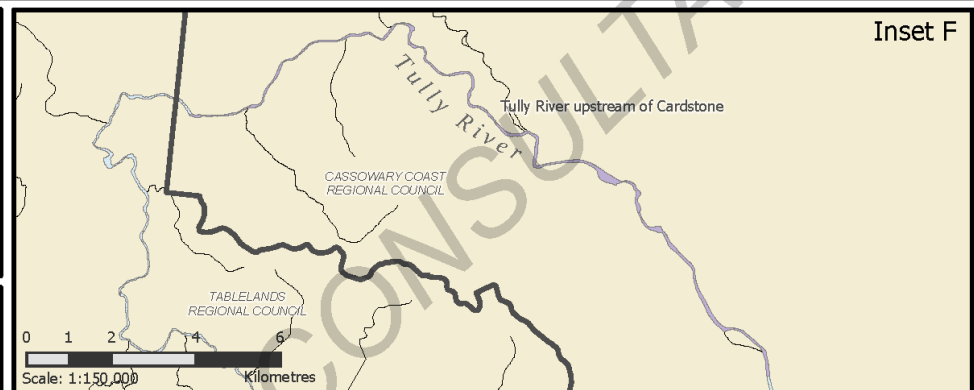
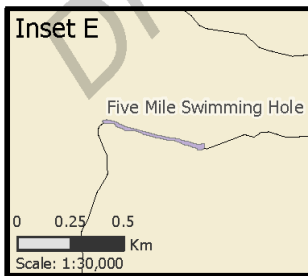
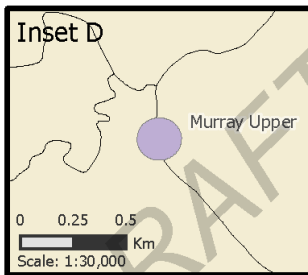
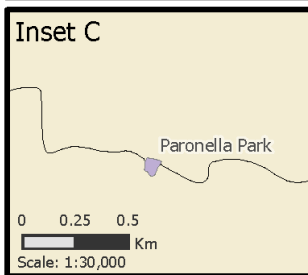
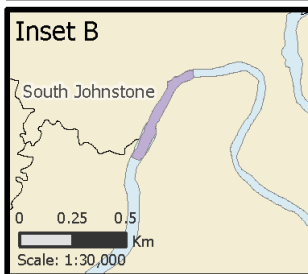
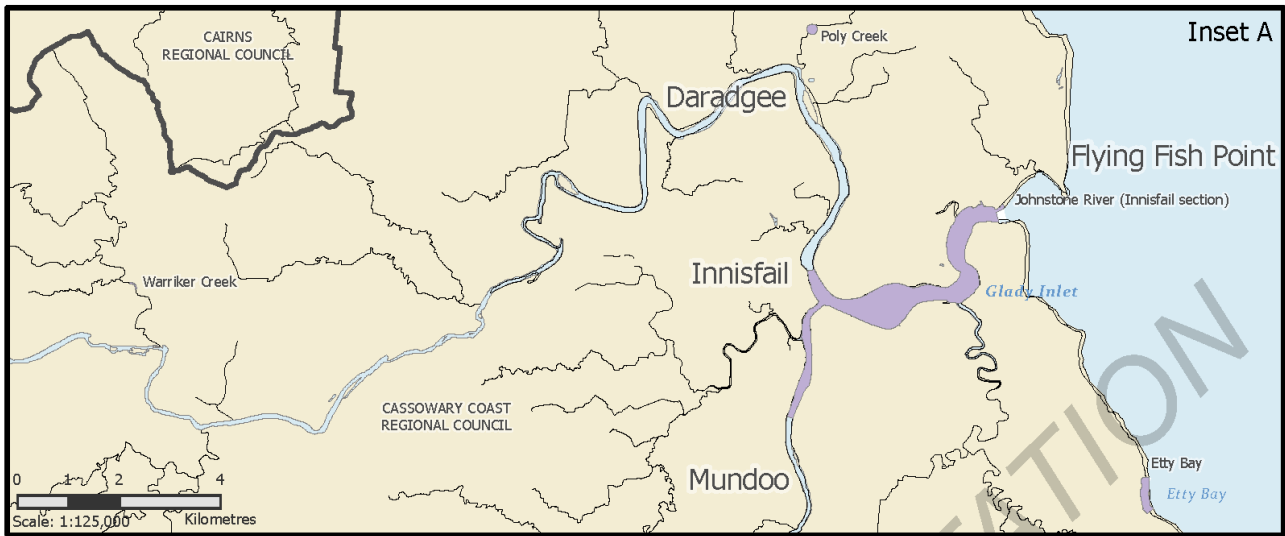


Cassowary Coast Regional Council (map 1 of 2)



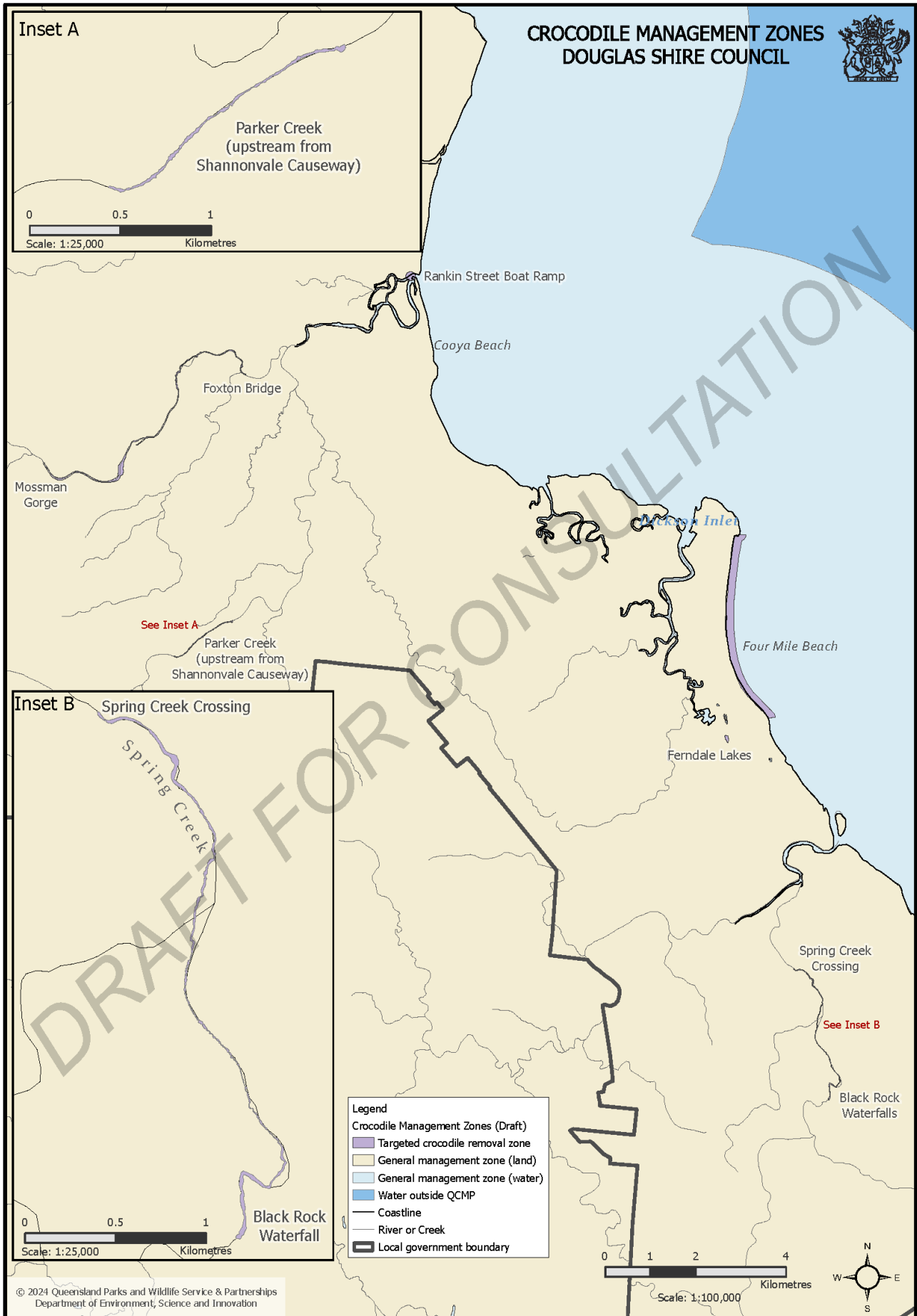
Cassowary Coast Regional Council (map 2 of 2)

CROCODILE MANAGEMENT ZONES CASSOWARY COAST REGIONAL COUNCIL INSET MAPS MAP 2 OF 2

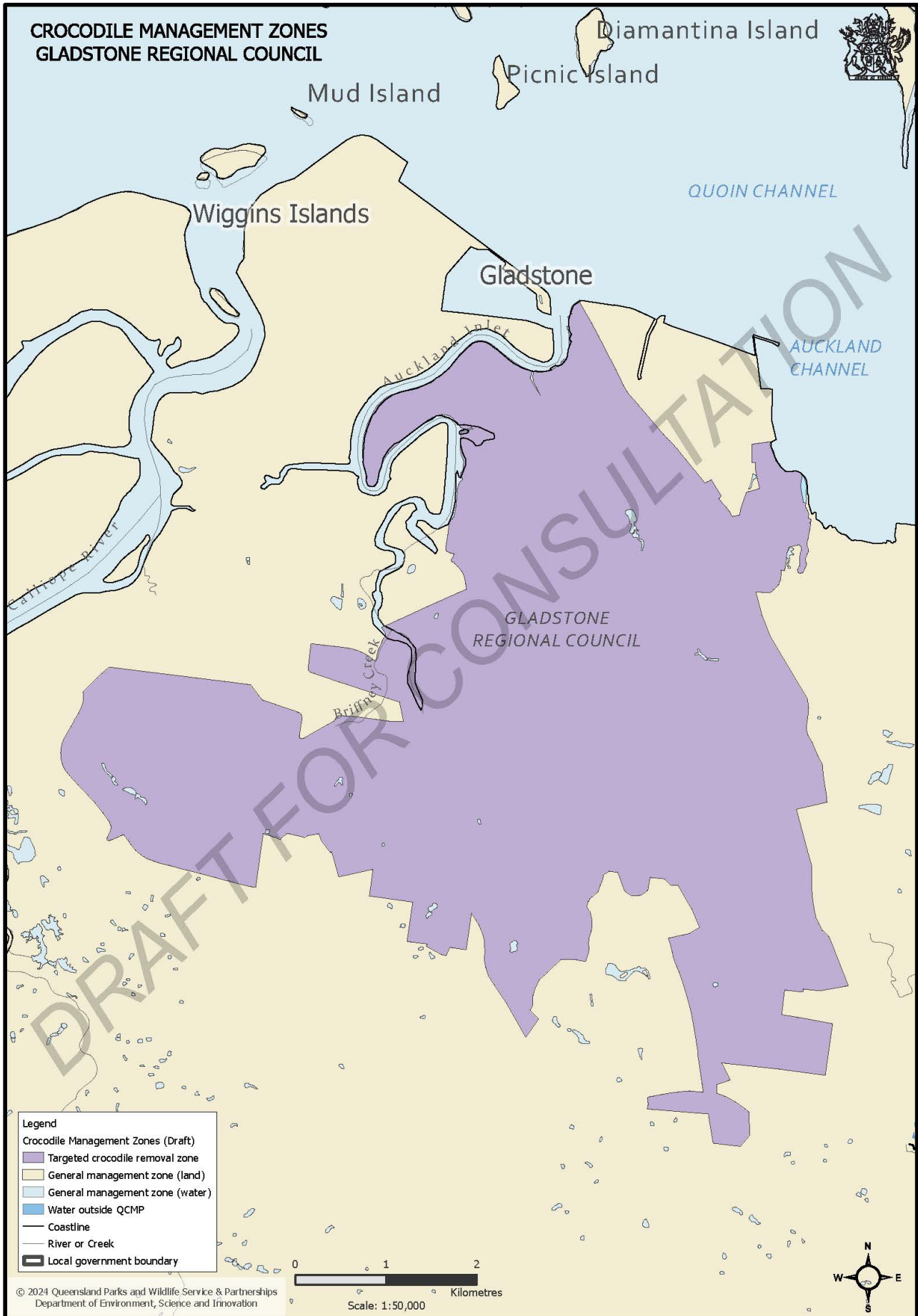




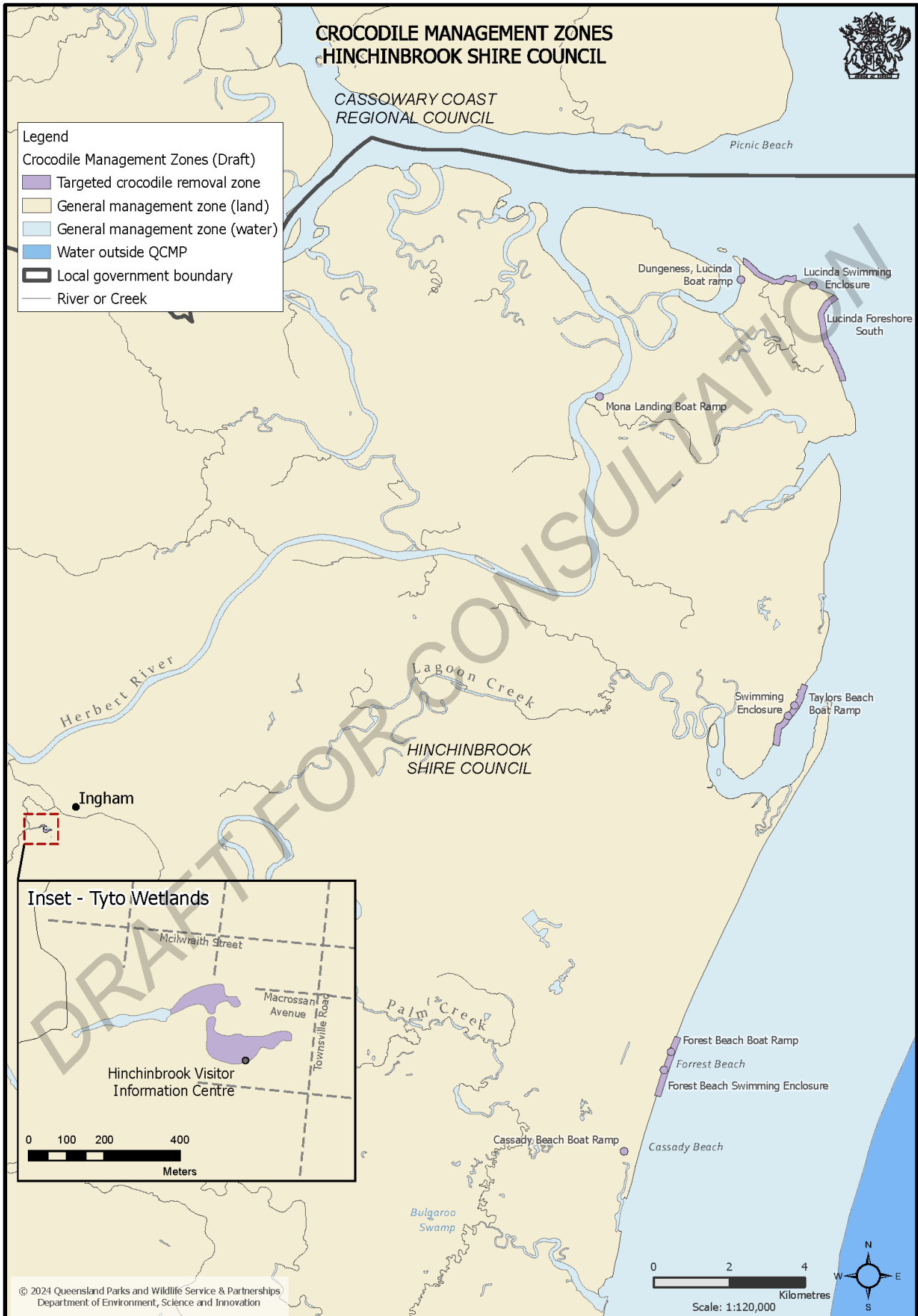
Douglas Shire Council map



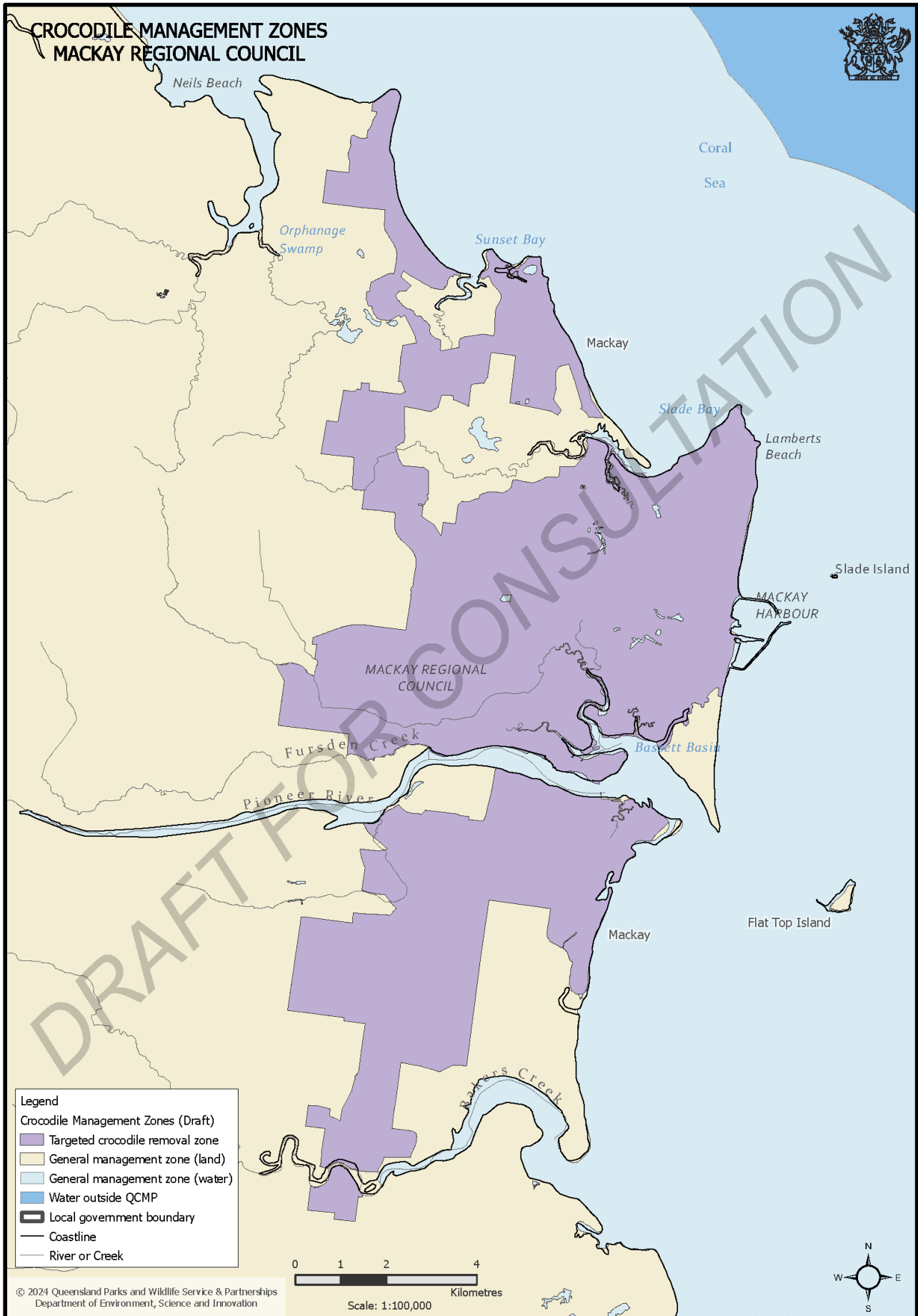
Gladstone Regional Council map



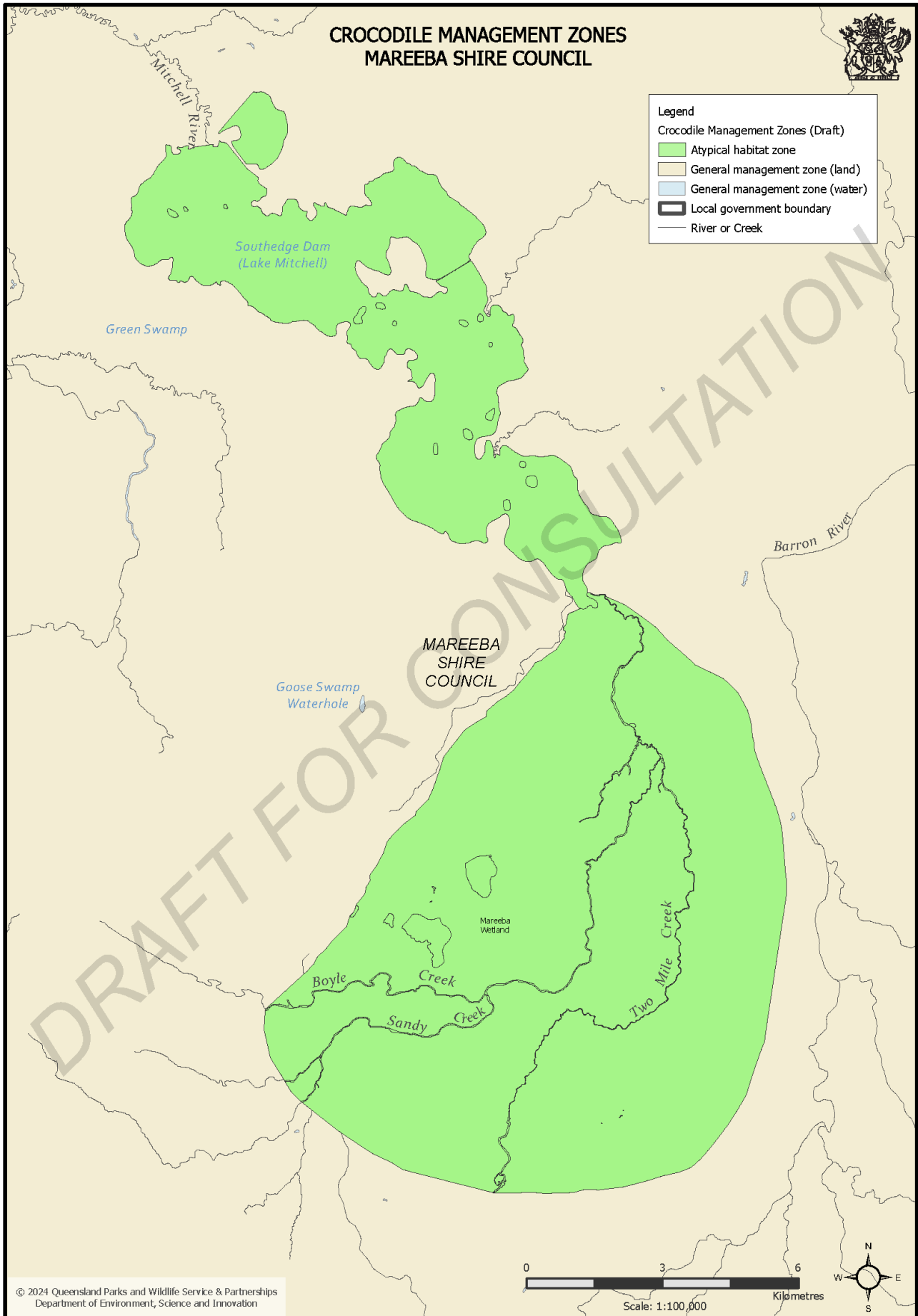
Hinchinbrook Shire Council map



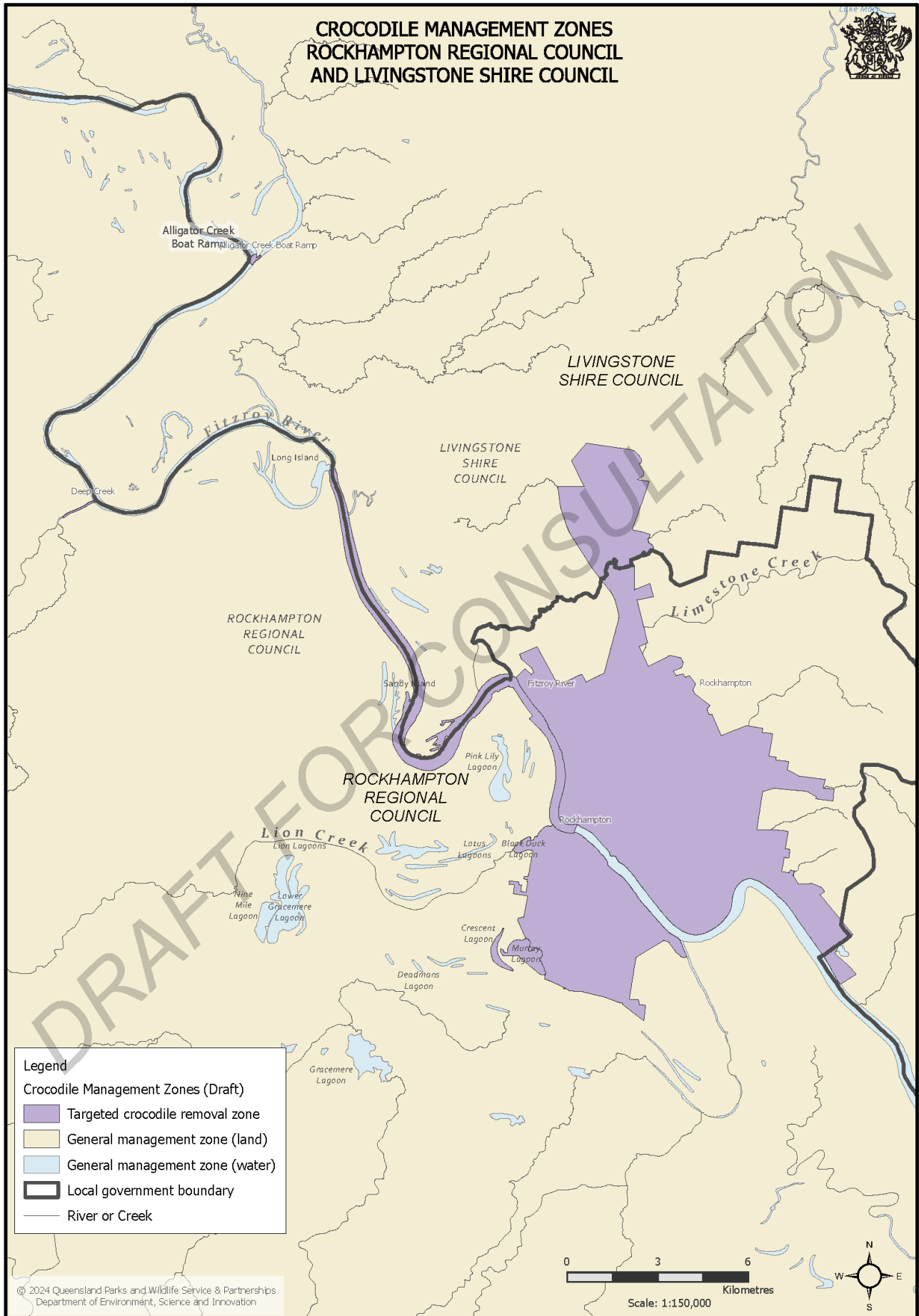
Mackay Regional Council map



Mareeba Shire Council map



Rockhampton Regional and Livingston Shire Council map



Townsville City Council map

