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National Environmental Science Program

CRCNA

DEVELOPING NORTHERN AUSTRALIA

REGIONAL PLANNING AND ASSESSMENT FOR SUSTAINABLE DEVELOPMENT IN THE GILBERT RIVER CATCHMENT

Analysis Report

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Cover images

Front: Gilbert River Tagalaka Country trees and rocks. Credit Jeanie Govan, Tagalaka Aboriginal Corporation.

Back: Gilbert River Qld. Credit Nathan Waltham, JCU TropWATER.

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Acknowledgement

We acknowledge the Traditional Owners of Country throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past and present.

Executive summary

The highly contested nature of development in northern Australia needs new solutions if we are to achieve genuinely sustainable development in our regions. In this context, sustainable development at the regional and/or catchment scale is viewed as the integrated achievement of the UN's Sustainable Development Goals (UNSDGs) and the legislative concept of Ecologically Sustainable Development (ESD). Operationalising this relies on applying emerging concepts of Environment, Social and Governance (ESG) thinking at the development project scale.

This research aims to address current failings in the regional-scale planning and development assessment system that currently hinder economic development in rural and Indigenous communities and fail to secure key biological and cultural values within the northern Queensland landscape. Nowhere is this problem more evident than in the Gilbert River catchment in Queensland's Gulf of Carpentaria.

To explore opportunities for improving the system of planning and development assessment across northern Queensland and northern Australia in general, this project has been developed closely with: the Commonwealth's Department of Climate Change; Energy, Environment and Water (DCCEEW); the Marine and Coastal and the Resilient Landscapes NESP hubs; the Cooperative Research Centre for Developing Northern Australia (CRCNA); Regional Development Australia Tropical North Queensland (RDA TNQ); and, the Etheridge Shire Council (ESC).

This **Analysis Report** focuses on issues affecting Queensland's Gilbert River catchment, as one of three sentinel case studies exploring these issues across the northern Australian landscape. The second is in the Douglas Daly Region in the Northern Territory (NT), and the third is in the Pilbara Region of northern Western Australia (WA). Together, these three case studies will develop the partnerships, knowledge and expertise needed to explore new directions for planning and development across northern Australia and contribute to the contemporary policy and standards development work that supports the current reformation processes associated with the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*.

A recent, collaborative analysis of the many complex issues facing future decision-making in the Gilbert River catchment (undertaken as NESP Research Project 1.32) showed tensions between conservation and development, indicating the need for a more regionalised, engaged and evidence-based approach to planning, development assessment and conservation investment decisions.

This report undertakes a more detailed governance systems analysis of the current system of decision-making influencing catchment-based outcomes that are important for sustainable development within the catchment and community. The analysis is based on (i) a detailed literature review of some 21 governance sub-domains that influence the achievement of sustainable development outcomes and, (ii) detailed interviews with 14 important catchment stakeholders.

This **Analysis Report** has enabled consideration of these findings and identified key 'pre-conditions of success' and proposed new approaches to integrated planning and development assessment within the Gilbert. The work has also led to a series of recommended next steps focused on potential solutions for strengthening the current governance system. These are presented in a separate **Solutions Report**. These solutions will explore the application of new mapping and facilitative approaches to help build cross-governmental and regional consensus about appropriate development models. They also explore the need to build long-term local institutional capacity for ecosystem service market attraction and offset management for landscape-scale conservation.

This work in the Gilbert, and sibling analyses in the Douglas Daly and in the Pilbara, are resources that support the development of genuine reforms in planning and development assessment to guide the current Commonwealth 'refresh' of the nation's Developing Northern Australia Whitepaper.

1 Background and context

Federal, State and local governments are seeking to consider priority strategic planning and development assessment issues facing key regions of northern Queensland. This means focusing on places where development pressures significantly impact on, and intersect with, the Commonwealth's *Environment Protection and Biodiversity Conservation Act* (EPBC). This particularly includes Matters of National Environmental Significance (MNES), areas and ecological communities of high biodiversity/environmental importance, and the social, cultural and economic interests of regional communities.

To explore these issues, a collaboration has been established involving the Commonwealth Department of Environment, Climate Change, Environment, Energy and Water (DCCEEW) *and* the Gilbert River regional community, particularly via Regional Development Australia Tropical North Queensland (RDA TNQ) and the Etheridge Shire Council (ESC). The work is informed by both recent research and stakeholder engagement delivered by *NESP MAC Hub Project 1.32* (Dale et al. 2022) examining the future of regional planning in Northern Australia, and the broader engagement currently undertaken by the CRCNA and the two NESP Hubs. The research component of the current collaboration is supported by the key universities associated with the NESP Resilient Landscapes and Marine and Coastal Hubs, and the CRCNA.

This more detailed analysis of the governance system concerning regional planning and development assessment processes that influence sustainable development outcomes has facilitated a shared focus on these complex issues within Queensland's Gilbert River catchment. Specifically, it has delved further into:

- a detailed Governance Systems Analysis of the current wider system of governance influencing catchment outcomes with implications for important *EPBC Act* matters; and
- consideration of the key 'pre-conditions of success' that will support better early-stage thinking about new and innovative approaches and/or integrated environmental assessment (e.g., regional governance systems reform, important knowledge management systems and improved data layers and collection and new approaches to offset framing and delivery).

This Analysis Report will enable us to progress the development of key recommendations in our **Solutions Report** that, if collaboratively progressed, will strengthen the regional planning system affecting landscape-scale outcomes in the Gilbert River catchment.

Finally, this process should enable shared decision-making regarding the prioritisation of progressive stages of continued research collaboration and support in the catchment beyond the end of June 2024. Through connection with similar work in the Douglas Daly (in the NT) and the Pilbara (in WA), this case study research will also contribute to the development of targeted findings aimed at improving the regional planning system across the greater north of Australia.

2 Overview of the Gilbert River Region

2.1 Regional resource values

NESP MAC Hub Project 1.32 briefly introduced the Gilbert River catchment as a regional planning case study of importance to northern Australia (see Map 1); the following overview builds on this as a basis for further discussion (see Dale et al. 2022).

The combined non-Indigenous and Indigenous community of the Gilbert River catchment comprises around 2,000 people. Very importantly, the region encompasses the traditional lands of the Kurtijar, Ewamian and Tagalaka Peoples. There are five native title determinations across approximately 90% of the catchment. The vast majority of this determined area is non-exclusive native title, with a few small areas of exclusive native title. This includes the following:

- east upstream of the junction of the Gilbert and Einasleigh rivers, native title rights and interests as confirmed by determinations QCD2013/006 and QCD2013/007 and managed by the Ewamian People Aboriginal Corporation RNTBC on behalf of Ewamian people;
- west upstream of the junction of the Gilbert and Einasleigh rivers, native title rights and interests as confirmed by determinations QCD2012/012 and QCD2012/013 and managed by the Tagalaka Aboriginal Corporation RNTBC on behalf of Tagalaka people; and
- west downstream of the junction of the Gilbert and Einasleigh rivers, native title rights and interests as confirmed by the determination QCD2022/009, and managed by the Mpundwithal Aboriginal Corporation RNTBC on behalf of Kurtijar people.

The catchment covers approximately 46,000km2 in northwest Queensland, and has a predominantly monsoonal and highly variable climate. It drains westwards from the western edge of the Wet Tropics region into the Gulf of Carpentaria.

Significant volumes of available unallocated water may be able to support new and existing agricultural development in the region where relevant approvals such as vegetation management requirements can be resolved. The largest current existing uses of land and water are pastoral operations, mines, tourism and fishing. There are a few emerging agricultural developments in parts of the Gilbert and some proposals for large new cropping-based developments. Pressure is starting to emerge in relation to wind industry development opportunities in the eastern parts of the catchment.

The western extent of the region has a complex estuarine environment and coastal vegetation that includes extensive intertidal mudflats, as well as supratidal salt flats, mangrove forests, saline grasslands and saltmarsh communities. Upland areas are vegetated with dry rainforests, eucalypt woodlands and low Acacia woodlands. The region's vegetation is largely intact, with less than 5 % of any sub-catchment cleared.

The Gulf Savannah NRM Plan identifies the region as one of the least studied areas for biodiversity in Australia (Gulf Savanna NRM 2023). A combination of local knowledge and sporadic data collection has, however, identified a rich and diverse array of vertebrate fauna. This includes at least 118 mammals, 196 reptiles, 63 amphibians and 455 bird species, including a number of endangered species such as the Golden-shouldered Parrot (Phsephotus chrysopterygius), Gouldian Finch (Erythrura gouldiae), Star Finch (Neochmia ruficauda), Red Goshawk (Erythrotriorchis radiatus), Northern Quoll (Dasyurus hallucatus) and the Yakka Skink (Egernia rugosa; see Dale et al. 2022). Areas of high biodiversity value are found in the Einasleigh Uplands (Bush Blitz 2023). Important wildlife refuges also occur in estuarine parts of the Gulf Coast, providing critical nursery grounds for commercially important species, including prawns, mud crabs (Scylla serrata) and barramundi (Lates calcarifer), as well as endangered and critically endangered migratory shorebirds.

There have been a number of studies of the environmental values of the Gulf's river systems and estuaries, but limited formal recording of cultural values, despite the region's great significance to its Traditional Owners. Natural resource studies were conducted within the Commonwealth Environmental Research Facility (CERF), the Tropical Rivers and Catchment Knowledge (TRACK) program, the National Environmental Research Program (NERP), past NESP projects, the CSIRO-led Flinders-Gilbert Agricultural Resource Assessment (FGARA) studies, and most recently, a CSIRO led Fisheries Research and Development (FRDC) modelling study.

There have been very few studies of the catchment's freshwater environment, though significant work is now commencing through the CRCNA-funded Northern Australian Universities (NAUA) Water Security Alliance. However, collectively, the Flinders, Gilbert and Mitchell estuaries are recognised as highly productive (Burford and Faggotter 2021, Burford et al. 2021a,b, Lowe et al. 2022 and Venarsky et al. 2022).

Freshwater waterholes are refugia in the dry season for many important species, including sawfish, barramundi, and crocodiles (Waltham et al. 2013). Annual wet season flooding ensures sufficient connectivity for fish and other species to move up and down the rivers and out onto the floodplains and wetlands where they feed and breed, as also in Mitchell River (O'Mara et al. 2021). Freshwater inputs also contribute greatly to the productivity of gulf fisheries (Burford et al. 2021a).

Migratory shorebirds that frequent the region include critically endangered and endangered species and other *EPBC Act* listed MNES. Some water bird species within the wider Gulf coastal region are at nationally or internationally significant numbers during summer months (Driscoll 1997, 2001, 2014 and Burford et al. 2021b). Several endangered aquatic species have also been identified by Waltham (2013). Finally, the region also has significant geological heritage values, but there also are limited protected areas across the catchment.

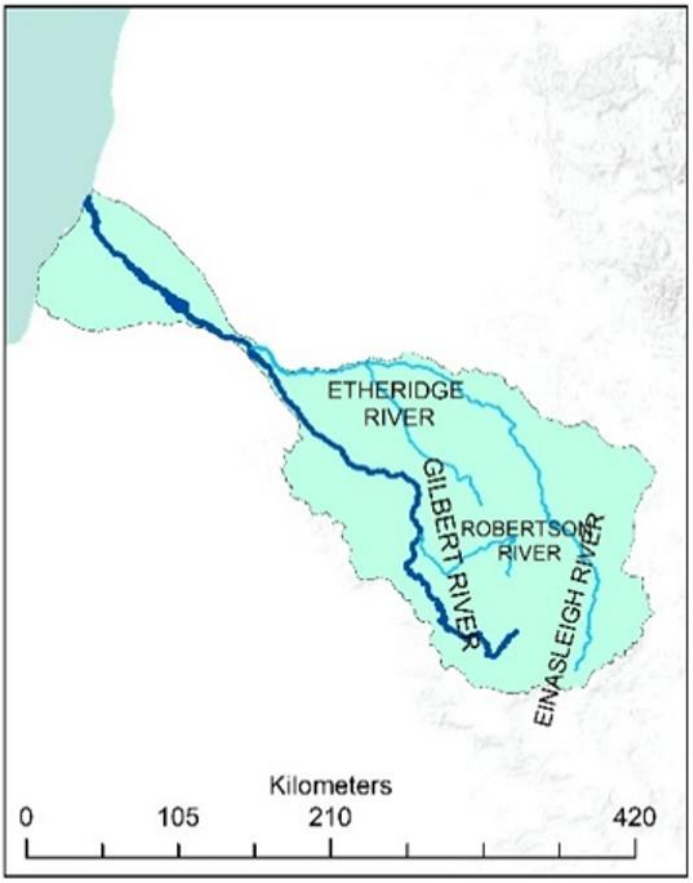


Figure 1: Map of the Gilbert River catchment (Supplied by TropWATER JCU).

2.2 Development opportunities and emerging threats to values

As mentioned above, the Gilbert River has potential for significant water based-development, primarily in the form of water extraction and water capture for irrigated agriculture and agricultural value-adding. Preliminary cotton, sorghum and other cropping development has already occurred in some limited areas (e.g. at Strathmore Station and Forest Home) and more areas are now being investigated across the catchment. The Queensland government's Gulf Water Plan (2007) identifies some 467 gigalitres of unallocated water for potential agricultural, industrial, and urban uses. This sits in the Plan's General Reserve. This is likely to change as a result of new hydrological model under development for Gulf Water Plan (2007) review. As part of the North Queensland Irrigated Agriculture Strategy, CSIRO conducted the Flinders and Gilbert (the FGARA Report). The 2013 final report concluded that, in the Gilbert, large instream dams could support 20,000 to 30,000 ha of irrigation in some 85 % of years (Petheram *et al.* 2013). CSIRO has also reported on Indigenous water values, rights, interests and development objectives in the Gilbert and related catchments (Lyons and Barber 2018).

More specific development actions that might be considered in the future economic development of the catchment include: in-stream dams, major private sector water storages and the innovative use of groundwater resources, under-ground dams, bed sand storage, and managed aquifer recharge particular to the Gilbert catchment (BRA&DP 2022). There are also significant future mining (critical minerals) development opportunities within the region, as well as potential for additional tourism developments. Environmental conflict in the western Wet Tropics may also result in increasing pressure for wind industry development in the eastern parts of the region.

Knowing the extent of some of these development pressures, it is important to point out that very significant water development within the catchment could reduce productivity in the estuaries due to a decrease in nutrient loads (Burford and Faggotter 2021) and reduced freshwater connectivity within rivers (Waltham et al. 2013, Ndehedehe et al. 2020). This could also contribute to the loss of wetlands and floodplain functions used by a range of species as demonstrated in the nearby Mitchell River (Molinari *et al*. 2021a, b and 2022). In addition, changing the water clarity in the Gilbert River freshwater sections (to a turbid environment) would alter the water column thermal profile and its consequent suitability for fish (Wallace et al. 2015, 2016). Alvarez (2015) also surveyed a number of complex management issues related to grazing, biosecurity, and erosion within the region. These combined works suggest emerging development efforts would need a deeper understanding of:

- how highly seasonal rainfall and interannual variability will affect freshwater systems;
- the impacts of shifting to more turbid water under development or hydrology changes (Waltham et al. 2013, McJannet et al. 2014), with implications for the water temperature profile in waterholes and supporting refugia habitat for fish (Wallace et al. 2015, 2016);
- how the delivery of freshwater flows will influence fisheries production;
- the impact of water extraction on groundwater-dependent ecosystems;
- how impacts interact with invasive species (particularly tilapia and pigs); and
- the modelled impact of other complex issues like climate change and mangrove die-back.

As mentioned before, native title has been determined over almost the entire catchment, in recognition of the ongoing cultural connection between First Nations peoples and the region. Therefore, the cultural values of the Ewamian, Kurtijar and Tagalaka Peoples must be considered and protected from any emerging development.

2.3 The state and trend of key EPBC outcomes

The proposed reform of the *EPBC Act,* and its extended timeframe, need careful consideration as part of any planning and development efforts in the Gilbert River catchment. Key fundamental areas highlighted in the *EPBC Act* reform are the need for:

- a clearer set of outcomes for the environment, that provide strong oversight and build trust and confidence that *EPBC Act* decisions deliver outcomes and adhere to the law;
- environmental management that accommodates Australia's future development needs, but in a sustainable way;
- implementation of the right level of protection to make a difference for the environment and to support adjustments where changes are needed; and
- inclusivity that harnesses and respects First Nation's values in ways that best inform how the environment is managed.

Any scenario of increasing agricultural development in the Gilbert River catchment will need to be aligned with the reforms planned for the *EBPC Act* (see DCCEEW 2022). Doing so will require a strong understanding of the state and trend of key MNES-related matters. This is, however, a substantive knowledge gap within this region of interest. Holistic and sensitive consideration of culture, economics, ecology and other environmental factors have been key foci within this current project, which may become an exemplar catchment study for future developments in northern Australia.

3 Identified development pressures and biodiversity values

The potential commercial viability of irrigated land development in northern Australia has generated much interest from community, government, industry and Indigenous groups. Research into the suitability and feasibility of irrigation development has also been investigated in the Gilbert, with the first major FGARA study occurring in 2012-2013. More recently, a strategic assessment of potential agricultural development areas in the catchment has been completed (Alluvium Consulting, 2022).

These studies outline areas that are potentially suitable for agricultural development, but also outline some of the important environmental challenges that need to be considered to ensure that conservation values, the floodplain and nearshore/offshore fisheries are not impacted negatively. In the case of the more recent Alluvium study, the impact of future projected warmer conditions was seen to be a major limitation on agricultural potential. Most of the development opportunities appear to be in the middle to upper parts of the catchment (Figure 2), but many of these areas, particularly in the upper catchment, also encompass important biodiversity values. Upstream development may also impact both upstream and downstream aquatic systems. This highlights the need to carefully plan development, explore relevant trade-offs and the conservation/cultural heritage management delivery systems needed to get the balance right should development commence in the catchment.

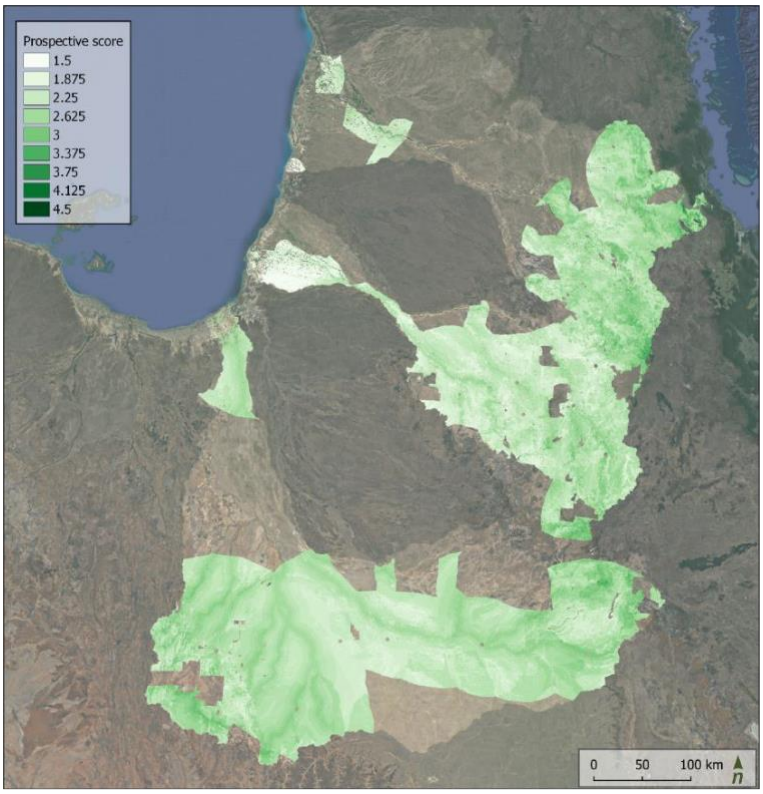


Figure 2: Suitability of land identified following the multicriteria analysis (score of 5 most suitable and 1 least suitable) as feasible under a less limited assessment scenario (reproduced from Alluvium Consulting 2022).

It is still not clear what form of irrigation-based infrastructure might eventuate within the catchment. These efforts could range from off stream capture and storage, which could be designed to have lower impact on aquatic systems (provided the return irrigation water is either reused or stored in dams), through to limited instream dam development possibilities. Either way, water extraction will likely place pressure on aquatic ecosystems within the catchment.

There are documented aquatic species of major significance in the catchment, including the freshwater sawfish (*Pristis pristi*s) and the giant freshwater whipray (*Himantura dalyensis*). It should be noted that *H. dalyensis* has been taxonomically split from *H. chaophraya,* which is recognised as Endangered on the IUCN Red List (Figure 3). These species are large growing and require access to permanent waterholes during the dry season. These waterholes typically form in smaller, disconnected rivers and waterways in the catchment, and these species are known to migrate to estuaries or upper tidal freshwater areas during stages of their lifecycle (Campbell et al. 2012).

The fact that these species have been recorded in the Gilbert River catchment highlights the importance of a connected river system, both for movement and for accessing key refugia areas. It is noted here, though, that there have been no real attempts to survey specifically for this species and for freshwater sawfish in the upper catchment. An inability to move throughout the catchment would deeply threaten these species. It is acknowledged that the relevant distribution data are limited to only a few records due to the lack of past surveys. However, based on this data, it is likely that these species occupy more sections of the river channels. Distribution maps of aquatic species across the whole catchment would therefore be needed before any significant development to ensure that these migratory species are not impacted. In addition, key ecological process questions need to be identified to understand the level of risk to river system changes, including water quality.

Agricultural development can impact downstream water quality via inputs of sediment, nutrients, herbicides and pesticides. The type and scale of impact depend on the type and intensity of agricultural activity. As part of the FGARA project, studies of several waterholes identified that even the early stages of a drought can start to cause stress in aquatic communities. Water temperatures, for example, often approached or exceeded the physiological limits of local fish species, and dissolved oxygen levels became very low, creating a risk of hypoxia (Waltham et al. 2013). Data is therefore needed on the immediate and long-term effects of severe droughts. This would provide useful information about how human impacts, such as extraction of water for irrigation, may impact aquatic species and the capacity of the ecosystem to cope with water deprivation.

Accordingly, there would be benefits from more extensive monitoring and assessment of waterhole conditions. Such a study is currently being progressed by JCU under the CRCNA-funded Northern Australian Water Security Alliance. This work will involve hydrological investigation to determine the extent to which the persistence of waterholes is reliant upon subsurface or surface water reserves, and to ascertain how much flow and/or rainfall is required to recharge them. Some of these waterholes also serve as vital drought refugia in the drier sub-catchments, and they are small enough to be adversely affected if even modest volumes of water were extracted directly from the waterhole or (more likely) from spears and bores situated in the streambed or adjacent alluvium.

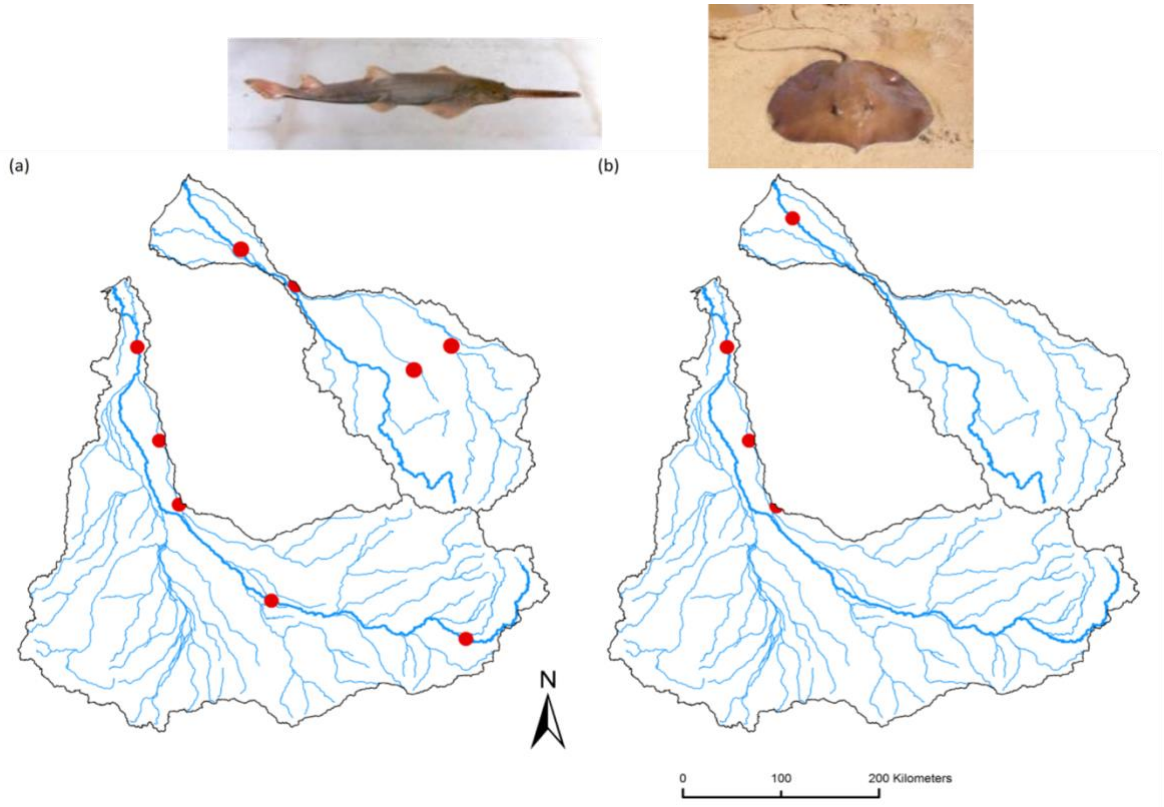


Figure 3: Captures or sightings across the Flinders and Gilbert catchments of: (a) freshwater sawfish (*Pristis pristis*), photo sourced S. Peverell; and b) freshwater whipray (*Himantura dalyensis*), photo sourced B. Pusey (Waltham et al. 2013).

Preliminary mapping to define the persistent waterholes in the upper catchment was completed during the FGARA project (see Figure 4; McJannet et al. 2014). In the region of the Einasleigh and Gilbert Rivers, a number of small waterholes (< 2.5 ha), and only a very few waterholes greater than 7.5 ha were identified. It is not known if the presence and persistence of these waterholes have changed since that work was completed. The permanency and water quality/habitat conditions of these refugia are critical in providing late dry season habitat for aquatic species. The location of these waterholes is also where the highest biodiversity occurs according to the mapping assessment in this study, which highlights the need to combine species distribution mapping with waterhole permanency mapping to understand the areas at highest risk from agricultural development.

Another study has mapped surface water (e.g. waterholes) and wetlands across multiple years and inferred areas (hotspots) of high primary productivity. This was done using a remote sensing approach (see Fig. 5, Ndehedehe et al. 2020). This study showed the high inter-annual variability in rainfall/runoff, which needs to be taken into account in terms of the impact of development, such as water extraction, in determining impacts on aquatic species. This mapping approach has not been ground-truthed and suggests the need for more calibration of data in order to verify its validity.

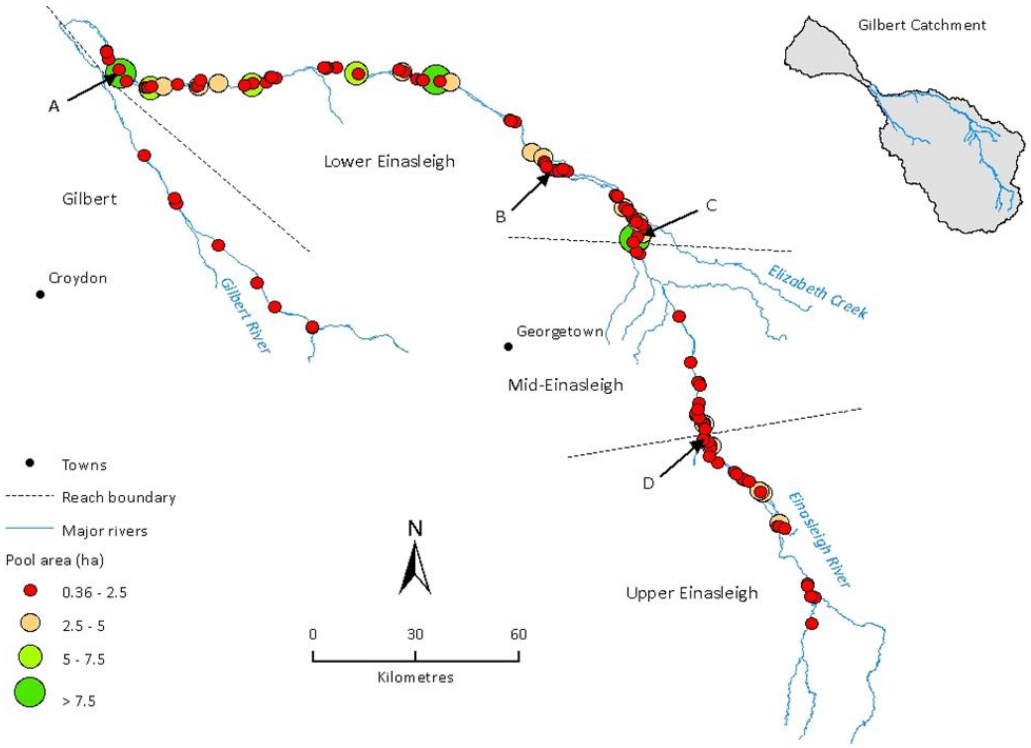


Figure 4: Location of the key aquatic refugia identified in the upper Gilbert catchment. Key aquatic refugia are defined as those which are present for more than 90 % of the time. The letters used represent regions examined in more detail in McJannet et al. (2014).

A study of the importance of freshwater flows for the productivity of estuaries and coastal waters has been determined for the Gilbert River estuary (as well as other Gulf rivers such as the Mitchell and Flinders Rivers) in a NESP-funded project (Burford et al. 2021 a,b and Burford and Faggotter 2021). The critical nature of nutrients associated with freshwater flows in fuelling primary productivity in the estuaries and the coast was demonstrated, with the inference being that a reduction in flows from water extraction for agriculture will reduce primary productivity, and hence the food supply fuelling complex food webs. This has been linked to impacts on animal species living in the estuaries, including macrobenthos such as molluscs and polychaete worms (Burford et al. 2021a, Lowe et al. 2021). The reduction in fisheries catch as a result of the reduction in freshwater flow has also been quantified using a modelling approach (Broadley et al. 2020), as well as the economic implications of a reduction in flow on fisheries catch (Smart et al. 2021).

Based on an emerging ‘heat mapping’ method being developed by our research team (which is in turn based on a habitat suitability approach developed by Pintor et al. (2019)), preliminary analysis suggests that there are two distinct regions where the habitat is suitable for higher numbers of threatened species; the downstream floodplain and the northeast or upper catchment headwaters (see Figure 6). This distinction is particularly clear for threatened plants which have hotspots in each of these two parts of the region. On the other hand, a higher number of threatened mammal species could be supported in the northeast headwaters of the catchment. The floodplain is likely to support higher numbers of threatened bird species than the rest of the catchment, owing to the interconnecting floodplain wetland network, and large mudflat and saltpan areas which are important nesting, feeding and roosting habitats in the catchment.

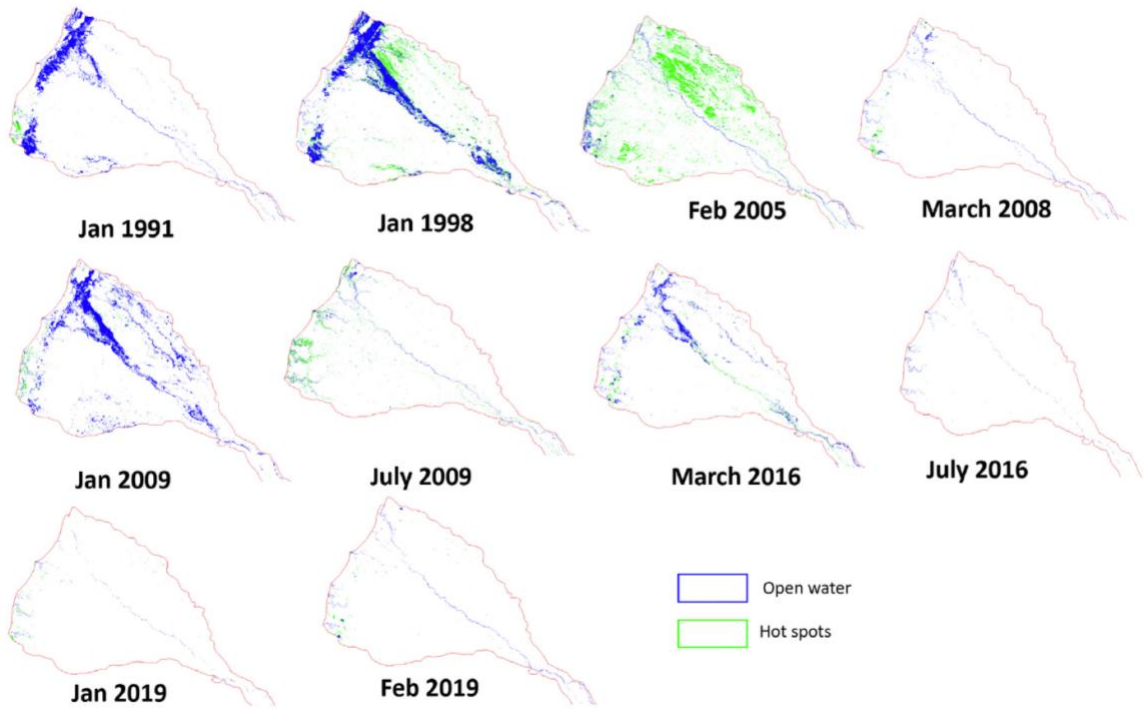


Figure 5: Spatial mapping of predicted open water and aquatic primary productivity hotspots in Gilbert catchment for years with flood events and relatively low flow years (from Ndehedehe et al. 2020).

It is important to note that lower levels of richness in the middle of the catchment do not necessarily mean that those habitats are less important more broadly, and they still represent a high species richness. These maps also do not show species identity and due to species turnover (i.e. the change in assemblage composition from headwaters to floodplain), the habitats in the middle reaches of the catchment may support unique species that are unable to persist in either the headwaters or the floodplain. This is a limitation of a method where very little data exists and, as such, relies on a habitat suitability approach.

For aquatic species, the downstream floodplain tends to have habitats that would support higher numbers of threatened aquatic species (Figure 7). For freshwater fish and molluscs, this tends to be in the main channels and distributaries on the alluvial fan. The coastal zone provides habitat that would support the highest richness of threatened shorebirds due to the high food availability (Burford and Faggotter 2021, Venarsky et al. 2022).

A critical aspect of aquatic habitats is the seasonal variation in flows. Previous research in the region has shown a strong connection between river flows originating in the headwaters and the ecological needs of freshwater fish and coastal shorebirds (Pusey et al. 2011, Burford et al. 2021b). These patterns are similar for maps showing hotspots of habitat suitability for all aquatic biodiversity (Figure 8). While these maps show the importance of local habitats where high numbers of species could persist, it is important to recognise that changes to flows in the headwaters would impact habitats on the floodplain, either through reducing the connectivity between the floodplain and river channels, which is important for fish migration, or when they dry out completely and become non-productive aquatic habitats for local species that utilise the floodplain (e.g. freshwater turtles).

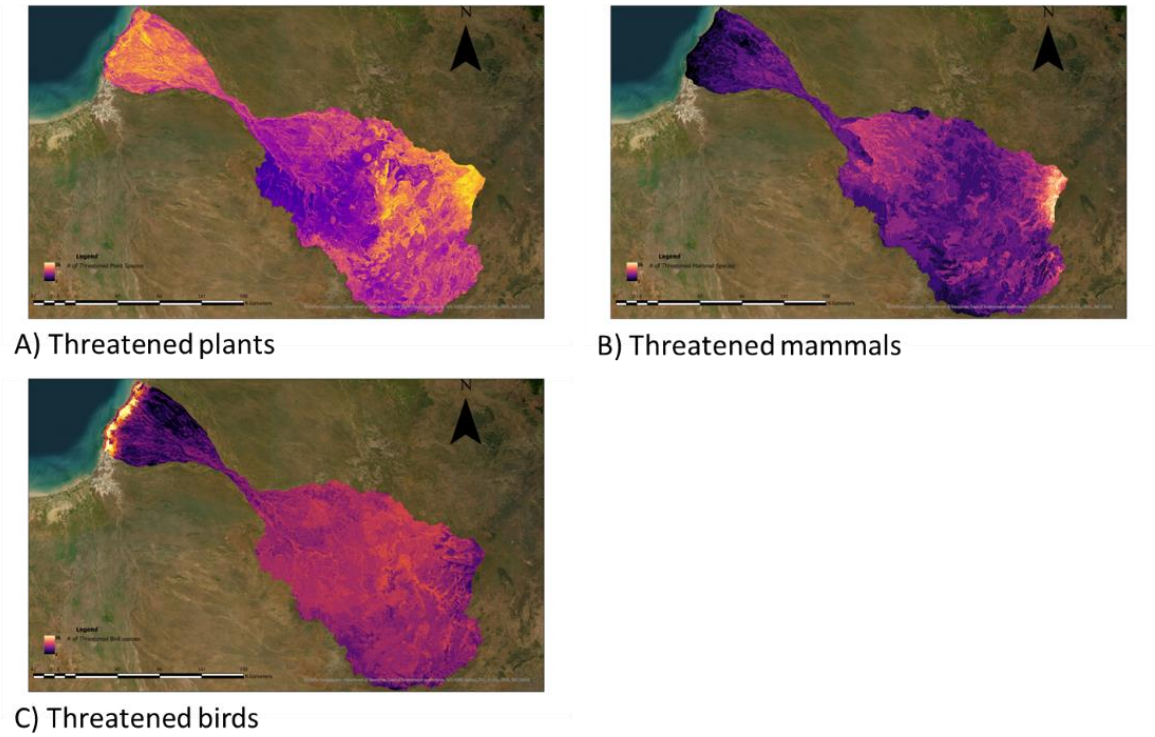


Figure 6: Hotspots of habitat suitability for numbers of threatened plants (A), mammals (B) and bird (C) species, with lighter colours representing habitat suitability for a greater number of species.

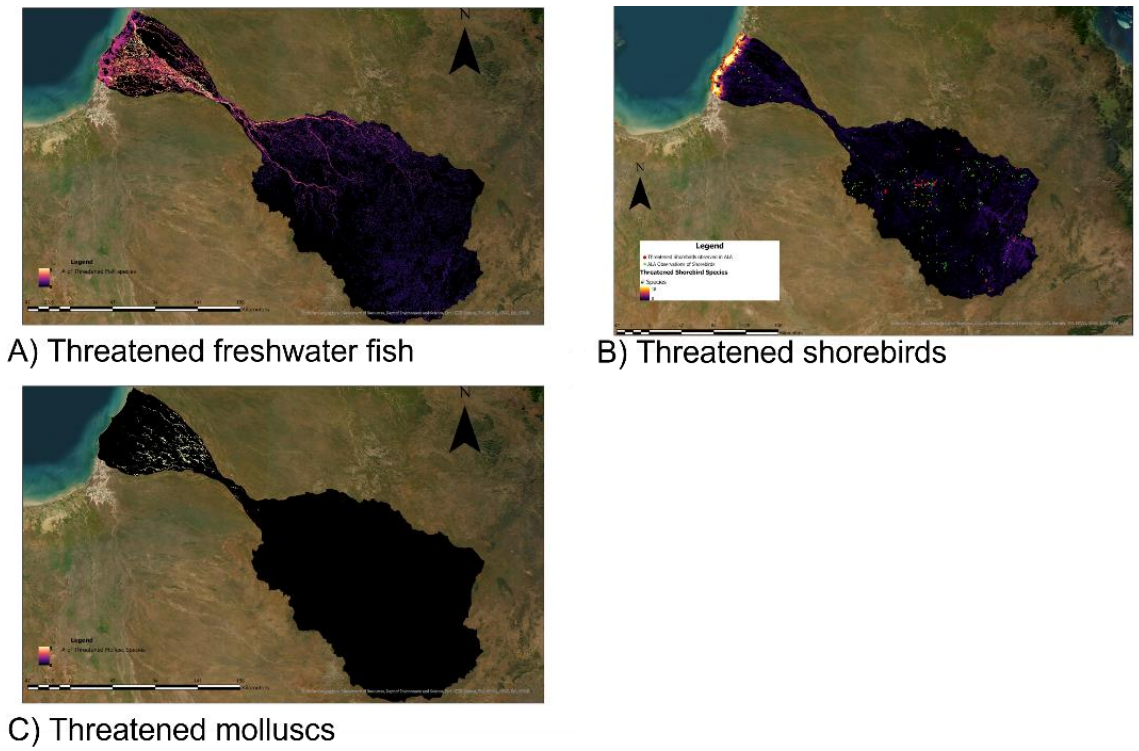


Figure 7: Hotspots of habitat suitability for numbers of threatened freshwater fish (A), threatened migratory shorebirds (B), and threatened molluscs (C), with lighter colours representing habitat suitability for a greater number of species.

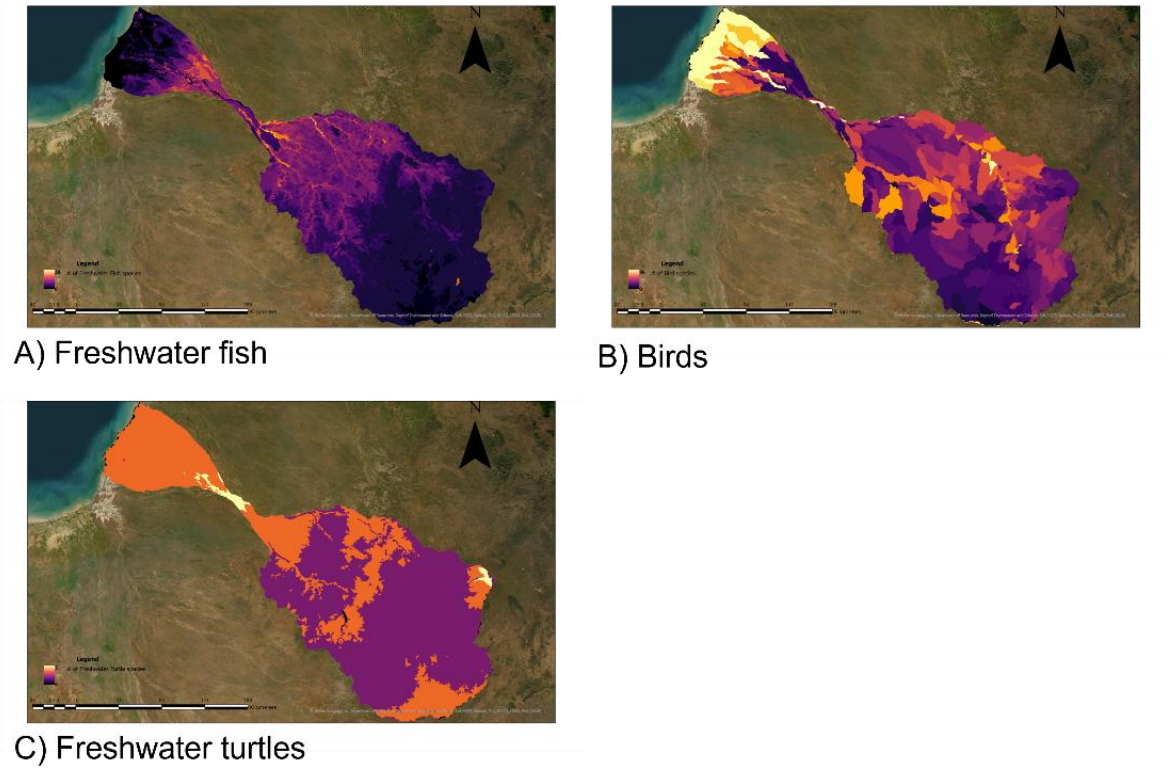
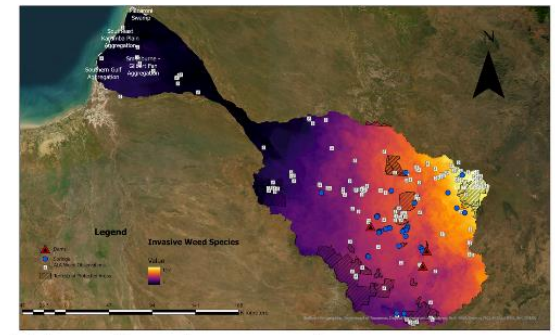


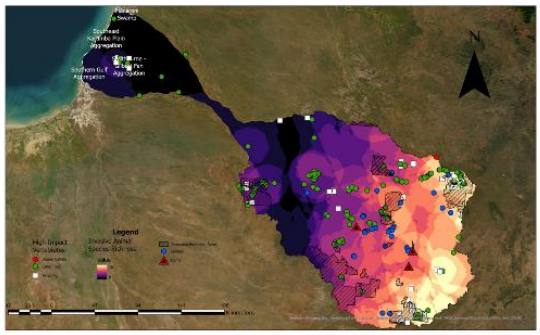
Figure 8: Hotspots of habitat suitability for the biodiversity of freshwater fish (A), all bird species (B) and freshwater turtles (C) in the Gilbert River catchment, with lighter colours representing habitat suitability for a greater number of species.

Some potentially threatening processes have also been identified, which relate to the presence of invasive animal and plant species, as well as climate change. In the analysis, threatening environmental processes also tend to occur in the headwaters and floodplains. Suitable habitats for invasive species tend to be in the headwaters, while it is habitats on the floodplain that show the highest level of climate risk (Figure 9). It is likely that projected sea level rise and drought are the primary drivers of this effect on the floodplain. It should be noted that unlike increases in sea level and ambient temperature, potential changes in other threatening processes associated with climate change (such as rainfall patterns, cyclone frequency and intensity) are difficult to determine due to the high level of uncertainty of current climate change prediction models for the Gulf.

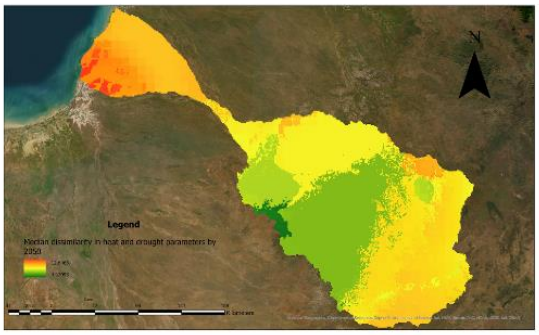
As a result, it is difficult to know what future climate conditions might look like. We have already seen the contribution of longer climate patterns in the Gulf, more broadly, to a major mangrove dieback occurring in 2015/16 along the coast, including the Gilbert River (Duke et al. 2017).



A) Invasive plant species



B) Invasive animal species



C) Climate Risk

Figure 9: Potentially threatening pressures on the Gilbert River catchment from invasive species and projected climate risk under RCP 8.5 (i.e. the highest baseline emissions scenario where emissions continue to rise through the twenty-first century). Lighter colours represent habitat suitability for a greater number of species.

4 Methods and approach

4.1 Governance systems analysis of the Gilbert River Region

Combined with the aligned and emerging biodiversity heat mapping approach introduced above, an analysis of the complex governance system underpinning sustainable development-related outcomes in the Gulf, has been applied to help focus attention on those system reforms that would deliver the best social, economic, cultural and environment outcomes for the catchment. This analysis of the catchment's governance system was undertaken by applying two primary methodological steps.

The first of these steps involved a semi-detailed application of the Governance Systems Analysis (GSA) approach developed via previous NESP hub investments. The approach is firmly based on previous theoretical and empirical approaches applicable to this sort of complex systems analysis. Detailed reference to these theoretical and empirical foundations can be found as follows:

- for a theoretical background to GSA see Dale et al. (2013a);
- to explore early empirical application and refinement of GSA, see Dale et al. (2013b); and
- to see examples of the detailed application of GSA, see Dale et al. (2016).

Dale et al. (2013a) suggest that governance systems concerning social, economic and environmental themes of our society, at any scale, cannot be viewed in isolation. Poor economic well-being, for example, often underpins social dysfunction. Social and cultural factors can drive natural resource degradation. Natural resource degradation is also a well-known precursor to economic collapse (Diamond, 2006). Within social, economic and environmental themes, major domains of governance can also be defined. In the social theme, for example, we may pay attention to major domains such as health, justice, social development and education. Finally, within governance domains, there may again be key activity-based sub-domains of critical importance to the health of the overall system.

Domains and sub-domains tend to represent distinct governance activities that have distinct policy and/or legislative foundations, and that draw in particular expertise sets and distinct stakeholder communities. Consequently, structures operating within particular governance domains and sub-domains tend to build their own cultures and they can eventually operate as silos of activities within the wider governance system. Each governance sub-domain, however, generally intersects with many other sub-domains. A specific coastal planning and management sub-domain, for example, may interplay with sub-domains related to agricultural development, maritime safety, or Indigenous nation building. The key implication of importance here is that, in undertaking governance analysis, we must be painfully aware that different governance themes, domains and sub-domains are highly inter-connected within both particular spatial and time scales.

In short, under the simplified GSA approach applied in this research, we identified the most significant governance system sub-domains (21 in total) that will influence sustainable development and EPBC-related outcomes of relevance to the Gilbert River catchment. We then assessed the governance health of each of those sub-domains using standard GSA principles. We have identified the following key sub-domains as important to development outcomes within the region:

- Federal Biodiversity Protection;
- Queensland Vegetation Management;
- Queensland Nature Conservation;
- Queensland Coastal Protection and Management;
- Queensland Cultural Heritage;
- Queensland Water Quality;
- Water Quantity;
- Federal and Queensland Fisheries;
- Terrestrial Biosecurity;
- Regional NRM and Landcare;
- Ecosystem Service Market;
- Northern Development;
- Queensland State Development;
- Queensland Regional and Local Land Use Planning;
- Queensland Agricultural Development;
- Queensland Tourism Development;
- Queensland Resources Sector;
- Energy Sector;
- Aboriginal Land Right;
- Queensland Education and Workforce Development; and
- Human Service Sector.

For each sub-domain, we considered simple analysis based on the following information:

- A sub-domain description and intended outcomes;
- Policy and legislative foundations;
- Operation of the sub-domain in the Gilbert;
- Key emerging sub-domain successes and problems for sustainable development; and
- Priorities for sub-domain improvement.

The results of this analysis are summarised below and outlined in more detail in Appendix 1.

4.2 Targeted interviews of key catchment stakeholders

To enable additional depth to this analysis we interviewed a purposeful sample of some 14 key stakeholder organisations that are most involved in regional planning and development decision-making within the catchment. Formal ethics approval was sought and received as part of the research process. The particular organisations targeted had a specific interest in regional level or development decision-making of relevance to the Gilbert River catchment. The selection focussed on ensuring that a diversity of the most relevant interests was

covered (e.g. Government agents, local government, environmental organisations, industry organisations, Indigenous land organisations, etc). With respect to each organisation that was identified, we aimed to focus our attention on interviewing actors of higher-level strategic importance to planning and development decision-making in the Gilbert. Those targeted organisational groups included:

- Commonwealth agencies;
- Queensland government agencies;
- Councils;
- Industry bodies;
- Conservation groups;
- Natural Resource Management (NRM) groups;
- Researchers; and
- Traditional Owner organisations.

The process of recruiting participants considered the scope and objectives of the proposed research. Interviews were conducted by Zoom and were not recorded. A non-identifiable and short confidential summary synthesis of key points was collated for each interview. The interviews were not fully transcribed. A thematic analysis of the synthesis materials was then undertaken at the end of the interview process, applying key aspects of the GSA framework.

Fourteen stakeholder organisations were effectively asked:

- what do you think are the key features of the Gilbert River catchment's regional planning and development assessment system;
- what role does your institution play in that system;
- what is currently working well about the regional planning and development assessment system in the catchment;
- what parts of the system need improvement; and
- what are your priority views about how the system can be strengthened?

Through both the literature-based governance systems analysis, and the additional details gained through the interviews, we were able to stand back and look jointly at both sets of data, enabling more effective identification of the key system-wide governance problems and potential solutions.

5 Key research results

5.1 Key identified governance system sub-domains

The following is an overview of our broad literature-based analysis of the 21 sub-domains identified as most relevant to regional planning and decision-making in the Gilbert catchment. These summaries are drawn from the more detailed data presented in Appendix 1. Sub-domains within natural resource, economic and social development themes were considered.

5.1.1 Federal biodiversity protection sub-domain

In the Federal context, Queensland's biodiversity is managed through the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (Cth) (*EPBC Act*). The Act seeks to involve the wider community in biodiversity planning and management. The *EPBC Act's* primary objective is the protection of the environment, especially those aspects that are MNES. The Act also seeks to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources and implementation of Australia's international environmental responsibilities. To achieve its objectives, the *EPBC Act*:

- strengthens intergovernmental cooperation and minimises duplication via bilateral agreements;
- provides for the intergovernmental accreditation of State and Territory environmental assessment and approval processes;
- adopts a Commonwealth environmental assessment and approval process; and
- identifies processes that threaten biodiversity and implements plans to address these.

A bilateral agreement allows the Commonwealth to rely on specified Queensland environmental impact assessment processes in assessing actions under the *EPBC Act*. As shown in Appendix 1, however, there are currently significant reforms emerging for this legislation, including a stronger focus on bio-regional planning activities and the development of Nature Positive markets.

MNES relevant to the Gilbert River catchment are nationally threatened species and ecological communities, and migratory species. Key challenges facing the application of the *EPBC Act* application in the region include:

- the lack of a bio-regional planning framework;
- the limited data available for effective development assessment;
- the physical disconnect of assessment staff that are based outside the immediate region;
- the lack of cohesive offset policy frameworks in fully vegetated landscapes; and
- the limited capacities of local organisations to engage in the development assessment process.

5.1.2 Queensland Vegetation Management Sub-Domain

Vegetation in Queensland is managed under the *Vegetation Management Act 1999* (Qld) (VMA), which regulates the clearing of vegetation. This is achieved by providing benchmarks for the assessment of developments that include proposed vegetation clearing. This can involve assessment against a development application or the enforcement of vegetation clearing provisions.

The vast majority of the Gilbert River catchment is under a regulated vegetation management classified as Category B (Remnant Vegetation). Under the VMA, remnant vegetation is not permitted to be cleared, except under limited circumstances. Development assessment is, therefore, now subject to regulated vegetation management considerations.

The VMA protects vegetation from broad-scale clearing, conserving the structural landscape, and hence contributing to the prevention of the loss of biodiversity and the maintenance of ecological processes. However, the VMA does not have ecologically sustainable development as a clear objective. While significant agricultural development has been enabled by the provision of water through the Gulf Water Plan, the VMA deeply constrains this opportunity, leading to significant tensions over what might be the most appropriate form of future agricultural and other development within the region. This uncertainty in turn, contributes to limited economic investment within the catchment. To resolve the conflicts between the limited capacity to clear vegetation in Gilbert and the large amounts of water available for agricultural development, a stronger bio-regional planning framework may need to be applied.

5.1.3 Queensland Nature Conservation Sub-Domain

Nature conservation in Queensland is managed under the *Nature Conservation Act 1992* (Qld) (NCA), the purpose of which is to conserve nature while allowing for the involvement of Indigenous people. It prescribes a process for conservation of nature through an integrated and comprehensive conservation strategy that involves the gathering of information and community education, identifying critical habitats and areas of major interest, and encouraging the conservation of nature through the education and cooperative involvement of the community, particularly landholders.

The NCA enables the dedication and declaration of protected areas representative of the State's biological diversity, natural features and wilderness. It allows for the management of these protected areas in accordance with the agreed management principles, plans, agreements and programs.

In the Gilbert River catchment, protected areas declared under the NCA include Blackbraes National Park, Rungulla National Park, Littleton National Park, Undarra Volcanic National Park and several nature refuges. Matters of State Environmental Significance to be protected under the NCA and other Queensland legislation have also been identified. The existence and sustainable management of significant protected areas are of importance to the key outcomes envisaged by the EPBC.

While a stronger bio-regional planning framework may need to be applied to help ensure the protection of declared nature conservation areas in the Gilbert, more effort and resources are actually needed to maintain conservation and cultural values within these areas.

5.1.4 Queensland Coastal Protection and Management Sub-Domain

Coastal protection and management in Queensland are achieved through the *Coastal Protection and Management Act 1995* (Qld) (CPMA). The main objectives of this Act are to provide protection, conservation, rehabilitation, and management of the coastal zone, including its resources and biological diversity. The Act also seeks to ensure decisions about land use and development safeguard life and property from the threat of coastal hazards. The CPMA does have regard for ecologically sustainable development as an object, making it valuable in regard to the basic protection of coastal resources. The objectives of the CPMA are to be achieved by coordinated and integrated planning and decision-making.

The Queensland Coastal Management Plan guides the implementation of the CPMA and provides non-regulatory, best-practice direction and guidance for the use of coastal resources to achieve coastal management outcomes, including how the Gilbert River catchment coast is to be managed. There are, however, limited development pressures on the coastal zone in the Gilbert.

A coastal management district has been declared for all the Gilbert catchment coastal areas to a distance of approximately 30 kilometres inland from the shore and offshore the boundary of Queensland state waters. With limited development pressure in the coastal zone, there are no immediate priorities for improved coastal planning and regulatory protection. Much could be done, however, to improve the management of biodiversity and cultural values within these coastal areas.

5.1.5 Queensland Aboriginal Cultural Heritage Sub-Domain

Aboriginal cultural heritage in Queensland is largely protected and managed through the *Aboriginal Cultural Heritage Act 2003* (Qld) (ACHA), which has the purpose of providing effective recognition, protection and conservation of Aboriginal cultural heritage. The ACHA establishes a duty of care that requires all land users to take all reasonable and practicable measures to ensure their activities do not harm Aboriginal cultural heritage.

Across Queensland, a State-owned Aboriginal cultural heritage database and cultural heritage register have been established, and these include some information relevant to the Gilbert River catchment. The cultural heritage database and register do not include a comprehensive record of Aboriginal cultural heritage in the Gilbert catchment, and planning instruments such as the Etheridge and Carpentaria local government planning schemes do not have complete cultural heritage mapping layers.

The limited extent of development and land clearing in the Gilbert River catchment suggests that Aboriginal cultural heritage values are likely to be reasonably intact in a physical sense. Aboriginal cultural information can be reasonably assumed to be held by Ewamian, Kurtijar and Tagalaka Peoples. For this reason, engagement for Aboriginal cultural heritage management purposes requires dedicated effort, resources, and timeframes. The Tagalaka Aboriginal Corporation RNTBC is the only registered Aboriginal Cultural Heritage Body (ACHB) in the region, covering about 10 % of the Gilbert River catchment. The remainder of

the catchment does not have an ACHB, so engagement for Aboriginal cultural heritage management purposes can be difficult. The extensive determinations of native title and subsequent establishment of RNTBCs, however, provide corporate structures with the potential to operate as ACHBs, but there has been limited investment in RNTBCs to support this role to date.

5.1.6 Queensland Water Quality Sub-Domain

Water quality protection in Queensland is mainly achieved through the *Environmental Protection Act 1994* (Qld) (EPA). The EPA's objective is to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (i.e. ecologically sustainable development).

Within this context, the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 was developed in relation to waters and wetlands (i.e. protecting Queensland's water environment while allowing for development that is ecologically sustainable). The consequent Environmental Protection Policy for Water (EPP Water) includes a process for:

- identifying Environmental Values (EVs) of waterways, including both aquatic ecosystem values, and human use values; and
- establishing corresponding Water Quality Objectives (WQOs) to protect identified EVs. WQOs are established for different indicators of water quality, such as pH, nutrients and toxicants.

Under the EPP Water, the Queensland Water Quality Guidelines inform the setting of water quality objectives required to protect or enhance environmental values for Queensland waters. They also provide guidelines for assessing and managing ambient water quality for the government and the community (including catchment/water managers, regulators, industry, consultants, and community groups).

Effective EVs and WQOs are being progressively determined for Queensland waters but have not yet been determined for the Gilbert River catchment. Systematic monitoring data does not exist to inform this. Until EVs and WQOs are determined specifically for the catchment, there will remain a limited baseline focus on the effective management and monitoring of water quality issues in the catchment.

5.1.7 Queensland Water Quantity Sub-Domain

The allocation of water in Queensland is primarily managed through the *Water Act 2000* (Qld). The Act was developed in response to the Council of Australian Government's (COAG) sponsored National Water Initiative (NWI) process. A primary purpose of the Water Act is to provide a framework for the sustainable management of Queensland's water resources, including the development of Water Plans.

The Water Plan (Gulf) 2007 includes the Gilbert River catchment, provides for the planning, allocation and use of water in the catchment, and will be in force until 1 November 2027. It identifies a total of 814,332 megalitres (ML) of unallocated available water, which is allocated across the eight separate Gulf catchments. These volumes are made available through three water reserves: (i) general unallocated water; (ii) Indigenous unallocated water (known as the Indigenous reserve); and (iii) strategic unallocated water. For the Gilbert River catchment, the general unallocated water reserve is 467,000 ML, the Indigenous reserve is 17,000 ML, and the strategic unallocated water is 5,000 ML.

The Gilbert River catchment has long been identified as suitable for irrigated agriculture. The availability of 467,000 ML plus additional reserves within the Gilbert River's general unallocated water reserve, while a significant enabler of irrigated agriculture, may also attract development pressures that could negatively affect EPBC and other environmental outcomes. To resolve the major conflicts between limited capacity to clear vegetation in the Gulf region, and large amounts of water available for agricultural development, a stronger bio-regional planning framework may need to be applied.

5.1.8 Federal and Queensland Fisheries Sub-Domain

Commercial fisheries are managed by both the Australian and Queensland governments. The Australian Fishing Zone (AFZ) extends from 3 to 200 nautical miles offshore and is established and managed through the *Fisheries Management Act* 1991 (Cth). The Australian Fish Management Authority (AFMA) is responsible for the day-to-day management and compliance of Commonwealth fisheries.

Fishing in Queensland waters, extending between the Queensland coast and three nautical miles offshore, is managed under the *Fisheries Act 1994* (Qld), administered by the Queensland Department of Agriculture and Fisheries (DAF). The Queensland Sustainable Fisheries Strategy 2017-2027 outlines the Queensland government's reform agenda for fisheries management.

The Staaten-Gilbert Fish Habitat Area has been declared for the estuarine and marine waters on either side of and between these two river mouths. Fish Habitat Areas (FHA) are gazetted under the Fisheries Act; however, they are managed by the Queensland Department of Environment and Science. The Queensland Gulf of Carpentaria Inshore Fin Fish Fishery (GOCIFFF) Status Report was prepared in June 2019 for reassessment and approval of the fishery under protected species and export provisions of the *EPBC Act*. The status report found, amongst other things, that the GOCIFFF continues to be managed in accordance with provisions in the *Fisheries Act 1994*.

A key consideration for Commonwealth fisheries management must be the potential for decision-making in the Gilbert catchment to induce changes in streamflow, fish passage, sediment and nutrient load and other factors that affect species populations both locally and further afield. Key research is needed to determine the impact of flow reductions on catchment and marine health. Maintaining flows in low- and medium-flow years is critical for sustaining estuarine productivity as these flows deliver essential nutrients that fuel primary productivity. There are also, at this stage, limited native title sea claims and determinations in the Gulf of Carpentaria seas, but it can be anticipated that claims will increase significantly in coming years and that Aboriginal people will increasingly seek to be more deeply involved in sea country management. Kurtijar People, for example, are investigating a Sea Country

Indigenous Protected Area at present. Additionally, other collaboratively managed Indigenous Protected Areas (IPAs) on the Queensland east coast have integrated FHAs into their IPAs (e.g., the Girringun Region IPA and the Maningalbay Yidinj IPA in the Wet Tropics region).

5.1.9 Queensland Terrestrial Biosecurity Sub-Domain

Weed and feral pests are major economic, environmental and cultural risks for the Gilbert River catchment. Issues of this nature are primarily managed through the *Biosecurity Act 2014* (Qld), which provides a framework for effective biosecurity management. The Queensland Invasive Plants and Animals Strategy (2019–2024) has been developed in the context of this Act. This strategy complements other key biosecurity documents, including:

- the Intergovernmental Agreement on Biosecurity (IGAB), plus the recommendations in the 2017 review endorsed by the Agriculture Ministers' Forum;
- national legislative obligations related to the *EPBC Act*;
- the Australian Pest Animal Strategy (2017–2027), which embodies eight principles that underpin effective pest animal management;
- the Australian Weeds Strategy (2017–2027), which provides seven principles of effective weed management; and
- the Queensland Biosecurity Strategy (2018–2023), with six strategic themes for management within the Queensland biosecurity network.

The Northwest Queensland Regional Biosecurity Plan was developed by the Northwest Queensland Regional Organisation of Councils (NWQROC) to establish a catchment approach to the management of invasive biosecurity matters. The plan includes the Etheridge, Croydon and Carpentaria LGAs and is relevant to all of the Gilbert River catchment. The Carpentaria Shire Biosecurity Plan 2019 is relevant to the Gilbert River catchment below the junction of the Gilbert and Einasleigh Rivers. Gulf Savannah NRM's 2023–2033 Natural Resource Management Plan for the Northern Gulf Region also identifies feral animals and pests, and invasive weeds, as pressures on environmental values.

First Nations Peoples in the region have identified biosecurity threats to the environment and cultural values through country-based plans, including the Kurtijar Land and Saltwater Country Plan 2014, Takalaka Country Plan 2021–2026, and the Ewamian Ranger Program.

5.1.10 Regional NRM and Landcare Sub-Domain

Queensland regional NRM bodies were established in 2003 with a key role to undertake regional natural resource management planning, prioritising regional level investments, coordinating actions at the landscape scale, getting community ownership in decision-making, and reporting on progress. Government investment for the regions has historically been based on regional plans and targeted programs, and some individual project applications. Regional NRM bodies develop their plans with feedback and advice from all levels of government, specialist advisory bodies and other key stakeholders. The regional NRM planning process

takes into account the environmental, economic, and social dimensions of any natural resource management issues and should be based on sound science.

The National Landcare Program (NLP) is a key partner in regional natural resource management activities. Regional NRM investment also connects with efforts for the recovery of species identified under the National Threatened Species Strategy. Regionally funded projects are also improving on-farm soil, biodiversity and vegetation, and increasing the capacity of farms to adapt to climate change and evolving market demands.

Gulf Savannah NRM is the regional NRM body, inclusive of the Gilbert River catchment, and has recently produced the 2023-2033 Natural Resource Management Plan for the Northern Gulf Region. Investment and support for the regional NRM system, however, have become fragmented in recent years. At present, however, in partnership with Gulf Savannah NRM, the National Landcare Program is implementing two key local projects: (i) the Healthy Farming Futures for the Northern Gulf Project; and (ii) the Biodiversity Bright Spots in the Northern Gulf for the Golden-shouldered Parrot Project.

5.1.11 Ecosystem Services Market Sub-Domain

Ecosystem services are the benefits provided to humans through the transformations of resources (or environmental assets, including land, water, vegetation and atmosphere) into a flow of essential goods and services such as clean air, water, and food. To restore and protect ecosystem services on a large scale, various environmental market-based approaches and frameworks have been and are being established, mainly by the Australian and Queensland Governments to incentivise investment by private capital, corporations and landholders. Examples include the existing Australian Carbon Credit Units Scheme and proposals for tradeable biodiversity certificates in the emerging Nature Repair Market. Demand for these existing and emerging markets could, for example, come from several sources, including: (i) carbon market participants seeking projects which also benefit nature; and (ii) philanthropic and Environmental, Social and Corporate Governance (ESG) motivated investment driven by reporting and disclosure requirements such as those framed by the Taskforce for Nature Related Financial Disclosures.

The ecosystem service market has limited current activity in the Gilbert River catchment. Projects that avoid the release of greenhouse gas emissions or remove and sequester carbon are currently the most readily applicable, but there has been limited establishment of such projects. The Australian Carbon Credit Units Scheme is currently the most operational option for ecosystem service market activity in the Gilbert River catchment. Under this scheme, only two projects have been established in the Gilbert.

5.1.12 Northern Development Sub-Domain

The 2015 Our North, Our Future: White Paper on Developing Northern Australia (White Paper) is the Government's 20-year framework to guide policymakers and investors in building a strong, prosperous, resilient northern economy. It is focused on developing industries and facilitating long-term economic growth. The Regional Development Australia (RDA) network is also of importance. RDAs are Commonwealth-based and support regional development projects in Northern Australia. They encourage policies that strengthen human capital, improve productivity, invest in infrastructure, increase access to markets, build our

regional comparative advantage and business competitiveness, increase economic activity, and create new jobs and social prosperity.

White Paper outcomes of relevance to the Gilbert include the establishment of key management structures to implement northern development policy objectives. These include the:

- Office of Northern Australia (ONA);
- Cooperative Research Centre for Developing Northern Australia (CRCNA);
- Northern Australia Infrastructure Facility (NAIF); and
- Regional Development Australia Tropical North (RDATN).

Priorities for reform in this policy area include the need for a better framework for regional-scale land use planning based on an engaged model of appropriate development that is evidence-based. The unique workforce needs of the Gilbert region also must be addressed to support sustainable economic development. This needs to at least involve developing skills in the local workforce, attracting skilled workers to the region, and ensuring the participation of Indigenous Australians in job opportunities. Importantly, the development of northern Australia should always be progressed in partnership with Indigenous Australians, with a focus on creating opportunities through education, job creation, and economic development. Ensuring Indigenous participation and benefit is a priority for reform.

5.1.13 Queensland State Development Sub-Domain

The *State Development and Public Works Organisation Act 1971* (Qld) (SDPWOA) drives the broad State-based perspectives and roles with respect to development of State significance. The SDPWOA provides for State planning and development through a coordinated system of public works organisation and environmental assessment coordination.

Major development projects have the potential to significantly impact social, economic, environmental and cultural values in the Gilbert catchment. Currently, there are few coordinated projects of State significance within the Gilbert River catchment. One example, however, is the 250-megawatt Kidston Pumped Storage Hydro Project in the upper Gilbert River catchment, which was a coordinated project that attracted an impact assessment report (IAR) process under the SDPWOA. It is possible that future water infrastructure or other major projects envisaged for the Gilbert River catchment would attract coordinated project status.

The SDPWOA is potentially a very useful device that could be used to resolve the significant conflict between agricultural development and environmental and cultural values in the region. As individual developments may be too small to trigger SDPWOA, there is a limited capacity among individual proponents to resolve national-scale policy conflicts. Under the SDPWOA, the declaration of a more precinct-based approach could be used to trigger a coordinated project under the Coordinator-General's discretion and the weighting of significant relevant factors. For the SDPWOA to work effectively, however, the capacity of core regional stakeholders to fairly engage in major project assessment processes needs strengthening.

5.1.14 Queensland Regional and Local Land Use Planning Sub-Domain

The *Planning Act 2016* (Qld) drives policy and decision-making associated with regional and local land use planning in Queensland. The Act's purpose is to establish an efficient, effective, transparent, integrated, coordinated, and accountable system of land use planning, development assessment and related matters to facilitate ecological sustainability. This includes state planning policies, regional plans, planning schemes for all local government areas, and a development assessment system for assessing and deciding development applications and establishing rights and responsibilities in development approvals.

State Planning Policies (SPPs) provide a consolidated and comprehensive view of the state's interests in land use planning and development. SPPs set out the matters that must be addressed in local government planning schemes and regional plans. The *Regional Planning Interests Act 2014* (Qld) (RPIA) manages the impact of resource development and other regulated activities on areas of the State that contribute, or are likely to contribute, to Queensland's economic, social and environmental prosperity.

A non-statutory Gulf Regional Development Plan (GRDP), now expired, was prepared by the Gulf Regional Planning Advisory Committee in 2000, and its area includes the Gilbert River catchment. The Etheridge Shire Council area closely aligns with the boundary of the upper Gilbert catchment, and the lower Gilbert catchment is within the Carpentaria Shire Council area. The planning schemes for these two local governments set out the integrated State, regional and local planning and development assessment policies for the Gilbert River catchment. Given development tensions in the region, a priority for improvement in the planning system would be the need for Federal, State and Local governments to establish partnerships to undertake more adaptive regional planning in the Gilbert.

5.1.15 Queensland Agricultural Development Sub-Domain

The Queensland Department of Agriculture and Fisheries (DAF) promotes and fosters agricultural development. A relevant State Planning Policy (SPP) identifies agriculture as a state interest under its 'Economic growth' theme. The state's interest in agriculture is that planning protects the resources on which agriculture depends and supports the long-term viability and growth of the agriculture sector.

Agricultural development may require completion of a development assessment, or other approvals. This means consideration of requirements under the planning scheme. The Australian government may also have interests such as biodiversity conservation and whether approval is needed under the *EPBC Act*, or the consideration of native title and whether there are future act procedural rights under the Native Title Act.

Agriculture is a key economic activity in the Gilbert River catchment, particularly beef production, hay production and horticulture. The availability of 467,000 ML from the Gulf Water Plan general reserve is a significant enabler of irrigated agriculture, and assessments have identified at least some 28,564 ha of irrigable land. Consequently, RDATN and Etheridge Shire Council have developed the Etheridge Shire Agricultural and Irrigation Precinct: Gilbert River Project Implementation Proposal. It needs to be recognised, however, that intensive agricultural activity and development in previously undeveloped areas will impact biodiversity, cultural and social values. A better framework for regional-scale land use planning driven by an evidence-based model of appropriate development is needed.

Supporting the unique agricultural workforce needs of the Gilbert region must also be addressed to support sustainable economic growth. This involves developing skills in the local workforce, attracting skilled workers to the region, and ensuring the participation of Indigenous Australians in job opportunities.

5.1.16 Queensland Tourism Development Sub-Domain

The Queensland Department of Tourism, Innovation and Sport promotes tourism development under the *Tourism and Events Queensland Act 2012* (Qld). Tourism development activities that attract assessment and approval will usually be considered and decided according to the local government planning scheme and *Planning Act 2016* processes. Large integrated projects could attract the attention of a coordinated process under the SDPWOA.

Tourism based on natural and cultural values is an important activity in the Gilbert River catchment, including the Talaroo Hot Springs operated by the Ewamian people. Fishing and the general enjoyment of surface water are major attractors for tourism in the region, with 90 % of tourists to the Gulf region citing fishing as the main reason for their visit. The development of water resources in the catchment may both positively and negatively impact tourism by altering natural flow regimes and, hence, fish stocks or by providing new water bodies, perhaps artificially stocked with fish.

Tourism development in the Gilbert will rely on the protection and promotion of key natural and cultural values and assets, and agricultural development will bring new opportunities and infrastructure of value to tourism. As such, tourism development needs to seek a better framework for regional-scale land use planning driven by an evidence-based model of appropriate development.

As with other sectors, the unique tourism workforce needs of the Gilbert region must also be addressed to support sustainable economic growth. This involves developing skills in the local workforce, attracting skilled workers, and ensuring the participation of Indigenous Australians in job opportunities.

5.1.17 Queensland Resources Sector Sub-Domain

The Queensland Department of Resources is responsible for ensuring the best use of renewable and non-renewable mineral and energy resources. Key pieces of legislation driving the development of the resources sector in Queensland include the *Mineral Resources Act 1989* (Qld) and *Petroleum Act 1923* (Qld).

The Mineral Resources Act regulates resource sector activities associated with prospecting, exploring, and mining of minerals, and is the most frequently utilised resource legislation. Other resource legislation encourages and facilitates responsible exploration for, and production of, petroleum and gas, and geothermal energy. Mining and petroleum extraction are exempt developments under the *Planning Act 2016* (Qld). This means that assessment, approval and regulation of mining and petroleum extraction operate separately from all other forms of development in Queensland. Mines require an environmental authority under the Environmental Protection Act 1994 to operate.

There are numerous mining and mineral exploration and development leases currently in the Gilbert catchment and a small number of exploration licences for petroleum, coal and geothermal energy. Resources sector development is assessed and approved separately from other forms of development, and the sector resists the 'sterilisation' of areas through restricted access because of environmental or other factors. Priorities for sub-domain improvement would include greater consideration of the potential expansion of the resources sector through a stronger bio-regional planning framework.

5.1.18 Queensland Energy Sector Sub-Domain

The Queensland energy sector utilises different types of fuels, including coal, solar, hydro, geothermal, pumped hydro, gas, wind and bioenergy. The Queensland Government is currently reviewing its state energy laws, which broadly include the *Electricity Act 1994*, the *Gas Supply Act 2003*, the *Energy and Water Ombudsman Act 2006* and the *Liquid Fuel Supply Act 1984*. The purposes of these Acts are mainly concerned with regulation of the generation, production, transmission and distribution of energy supplies, and the resolution of disputes associated with energy and water. Significant coordinative effort is now going into the general decarbonisation of the energy sector.

The only major energy sector operator in the Gilbert catchment is the Kidston Clean Energy Hub, located at the old Kidston mine site. The combination of wind, solar and hydro completes the Kidston Clean Energy Hub and provides a globally unique integration of renewable energy needs. Four projects comprise the Hub:

- 50MW Kidston Solar Project;
- 250MW Kidston Pumped Storage Hydro Project (K2-Hydro);
- 270MW Kidston Solar 2 Project; and
- 150MW Kidston Wind Project.

There is likely to be increasing pressure for renewable energy development in the east of the Gilbert catchment. Energy sector development, however, is assessed and approved separately from other forms of development, and again there would be value in ensuring a stronger bio-regional approach. As such, priorities for sub-domain improvement would again include greater consideration of the potential expansion of the energy sector through a bio-regional planning framework.

5.1.19 Aboriginal Land Rights and Nation Building Sub-Domain

Aboriginal land and sea rights are provided through the *Aboriginal Land Act 1991* (Qld) (ALA) and the *Native Title Act 1993* (Cth) (NTA). They establish Aboriginal freehold tenure and native title rights and interests, respectively. Aboriginal freehold tenure usually includes rights to timber and gravel, and some *Water Act 2000* (Qld) Water Plans provide Aboriginal water rights through an Indigenous reserve.

There is one 2.3 ha block of Aboriginal freehold in Georgetown, held by the Ewamian Aboriginal Land Trust. There is no remaining land identified as transferable to Aboriginal freehold. Native title has been determined to exist in about 90 % of the Gilbert catchment through five native title determinations. The vast majority of this determined area is non-exclusive native title, with a few small areas of exclusive native title. As mentioned previously, the Registered Native Title Bodies Corporate (RNTBCs) that hold and manage native title rights over much of the catchment are the:

- Ewamian People Aboriginal Corporation RNTBC;
- Tagalaka Aboriginal Corporation RNTBC; and
- Mpundwithal Aboriginal Corporation RNTBC.

Only the Tagalaka Aboriginal Corporation RNTBC is also a registered Cultural Heritage Body. Given the extent of native title rights and interests throughout the Gilbert River catchment, the proposed future development is likely to attract native title future act processes and would, therefore, require the negotiation of an Indigenous Land Use Agreement (ILUA).

The Water Plan (Gulf) 2007 provides an Indigenous reserve of 17,000 ML for the Gilbert River catchment area, and Aboriginal parties could also access the water plan's general and strategic reserves. The Ewamian People Aboriginal Corporation has established the Ewamian Rangers Program, and the Carpentaria Land Council Aboriginal Corporation (CLCAC) hosts the Normanton Land and Sea Rangers. The Tagalaka Aboriginal Corporation is currently establishing a permanent ranger program in 2024 with Queensland Indigenous Land and Sea Ranger funding.

No Indigenous Protected Areas (IPA) have been developed anywhere in the Gilbert River catchment or Gulf waters adjacent to the Gilbert. A proposal by the Carpentaria Land Council Aboriginal Corporation for the Kurtijar Sea Country IPA, which includes the coastal area of the Gilbert catchment, and a proposal by the Ewamian People Aboriginal Corporation for the Talaroo IPA, are currently IPA consultation projects.

5.1.20 Queensland Education and Workforce Development Sub-Domain

Australia's education system generally consists of 13 years of schooling, with attendance required from age 6 until age 16. Tertiary education in Australia includes both higher education and Vocational Education and Training (VET). VET is primarily the responsibility of the Australian Government and the individual State and Territory Governments. The Australian Government provides funding and regulation support to government-funded Technical and Further Education (TAFE) institutes, adult and community education centres, and private Registered Training Organisations. In addition, Australia's Skilled Migration System is designed to attract highly skilled individuals to live and work in the country.

There are three state schools in the Gilbert catchment at Georgetown, Forsayth and Mt Surprise offering schooling up to grade 6. There are no high schools or tertiary facilities in the catchment, so students must leave the region for secondary or tertiary education, resulting in a potential loss of families and labour from the region's workforce. Weaknesses

in the education and workforce development system increase regional inequality, exacerbating disparities in educational opportunities and outcomes among students. To support regions like the Gilbert, the education system needs to continue to increase equity across the public school system for First Nations people and others in remote places.

5.1.21 Human Service Sector Sub-Domain

The human service sector represents a range of socially-oriented services required to ensure communities are liveable and functional. These include education, health, housing, police and a wide range of social service delivery agents. Socio-economic and cultural factors specific to rural Australia are key influences of underlying human service challenges in remote places like the Gulf region. People in such areas are more likely to die from lung cancer, chronic heart disease, stroke, suicide, injury, poisoning, road traffic injury, diabetes, asthma and chronic obstructive pulmonary disease. The rate of suicide in rural Australia indicates a high prevalence of mental health issues. These issues are exacerbated by economic and housing challenges.

All of the Gilbert catchment is classified as “Very Remote Australia”. Data shows that the numbers of aged care, childcare, and hospital services are significantly lower than across Queensland; Croydon and Etheridge Shires do not have any aged care facilities or fire stations. The lack of services within the region adversely affects both the viability of agricultural enterprises and the general liveability of the region. This significantly influences the capacity of the region to attract the skilled workforce needed for effective economic growth and sustainable natural resource management. Housing access is a particularly acute regional social service problem.

Effective resolution of regional land use and natural resource conflicts will be essential to shift the economic dilemma facing the communities within the Etheridge, Croydon and Carpentaria shires. A longer-term strategic approach to monitoring regional community resilience is required, as well as an associated strategy for progressing the development of community building strategies.

5.2 An integrated systems overview

Dale and Marshall (2020) note that while the region’s outdated but formal regional plan is currently under review, most decisions are both promoted or regulated by more fragmented pieces of natural resource management legislation.

Extensive water resource planning has been driven by an aspiration for agricultural and industrial development in the Gulf catchment. Specifically, following the findings of the Flinders-Gilbert Agricultural Resource Assessment (FGARA), the Gulf Water Plan (2007) was amended to include a greater volume of unallocated water reserves for consumptive use. In the national context, biodiversity considerations related to development within the catchment are managed separately through both the Commonwealth’s *EPBC Act* and the State’s Nature Conservation Act 1992 (Qld). By proxy, however, the State’s Vegetation Management Act has the most significant implications for decision-making relating to biodiversity issues within the catchment.

In the context of the Gilbert River catchment, the *EPBC Act* provides a legal framework to protect and manage internationally and nationally important flora, fauna, ecological

communities, and heritage places. In any regional context, the Act aims to balance the protection of these crucial environmental and cultural values with society's economic and social needs by creating a legal framework and decision-making based on the guiding principles of ecologically sustainable development (ESD).

If developers ascertain that they might have a significant impact on any MNES, they need to apply for approval to proceed under the *EPBC Act*. This approval process is in addition to any state or local government approvals that might be required. When a proponent wants an action assessed for environmental impacts under the *EPBC Act*, they must refer the project to the DCCEEW. Once submitted, there are five different levels of assessment, depending on the significance of the project. Each level involves considering technical information assembled by the proponent and comments made by the public.

Once a project has been assessed by the Department, it makes a recommendation to the Minister or their delegate on whether the project should be approved. In addition to considering potential impacts on MNES, the minister also considers the social and economic impact of the project in making a decision (DAW&E 2020). There is considerable potential to support these decision-making frameworks more regionally through both current and past research work. Research undertaken previously to support stakeholders in the Gilbert includes data created for the NESP Northern Australia Environmental Resources Hub to help prioritise threatened species and threatening processes (Pintor et al. 2019).

As in all regions in Queensland, the *Planning Act 2016* and *Planning Regulations 2017* (Qld) provide the foundation for Queensland's land use planning and development assessment decision-making. Major projects may be declared 'a coordinated project' by the Coordinator General under the *State Development and Public Works Organisation Act 1971* (Qld). Regional vegetation management plans, however, also provide significant regionally-oriented planning and decision-making frameworks for vegetation clearing in the catchment. Significant vegetation clearing, however, will generally require recourse to approval under the *State Development and Public Works Organisation Act*.

Complementary to this framework for vegetation management, the Queensland *Nature Conservation Act* provides the framework for the creation and management of protected areas, including national parks, conservation parks, resources reserves, nature refuges, coordinated conservation areas, wilderness areas, world heritage management areas, international agreement areas and protection of native species. The regulations under this Act provide detailed rules that regulate activities in protected areas and the sponsorship of a permit and licensing system for the taking or keeping of native wildlife. Separate State legislation protects more culturally important areas and sites within the region (Dale and Marshall 2020).

Gulf Savannah NRM is the designated Regional NRM Body for the Gilbert River catchment region, and they have recently updated their regional NRM plan. There are also broad alliances of local governments in the region, which sees the Etheridge and Croydon Shires tending to cooperate more to the east through the Far North Queensland Regional Organisation of Council (FNQROC), while Carpentaria Shire tends to relate more to the south through the Northwest Regional Organisation of Council (NWROC).

Finally, NTRBs and RNTBCs have key roles to play, though sea claims across the region are yet to be resolved. The western and coastal parts of the Gulf region are serviced by the

Carpentaria Land Council and the eastern parts by the North Queensland Land Council in their roles as NTRBs.

It is also worth considering that over recent years, there has been a growing body of research efforts that are progressively seeking to resolve knowledge gaps related to the Gilbert catchment (see Figure 10). All of these projects have potential value to inform more regionalised approaches to planning in the catchment. There has been an increasing amount of work focussed on exploring the linkages between water extraction and marine ecosystem health and productivity. New CRCNA-funded research has been commissioned to examine aquatic ecosystem health within the catchment through the Northern Australian Universities Alliance. The National Water Grid Authority has also commissioned (through Queensland's Department of Regional Development, Manufacturing and Water) an assessment of the agricultural potential of the wider Gulf region. Finally, CSIRO is exploring ecosystem service values in the catchment. All of these projects are helping to inform this NESP MAC Hub investment in research to improve the regional planning system within the Gilbert.

At the more general descriptive level, emerging results of the literature-based GSA work in the Gilbert particularly illustrate:

- a wide range of governance sub-domains associated with the region;
- incredible fragmentation of effort across these sub-domains;
- the fact that while there are multiple governance sub-domains, all key environmental and cultural heritage features are not necessarily adequately identified, protected or managed;
- significant risk of delivery or implementation failure on the ground; and
- very significant capacity limitations facing local actors within the region.

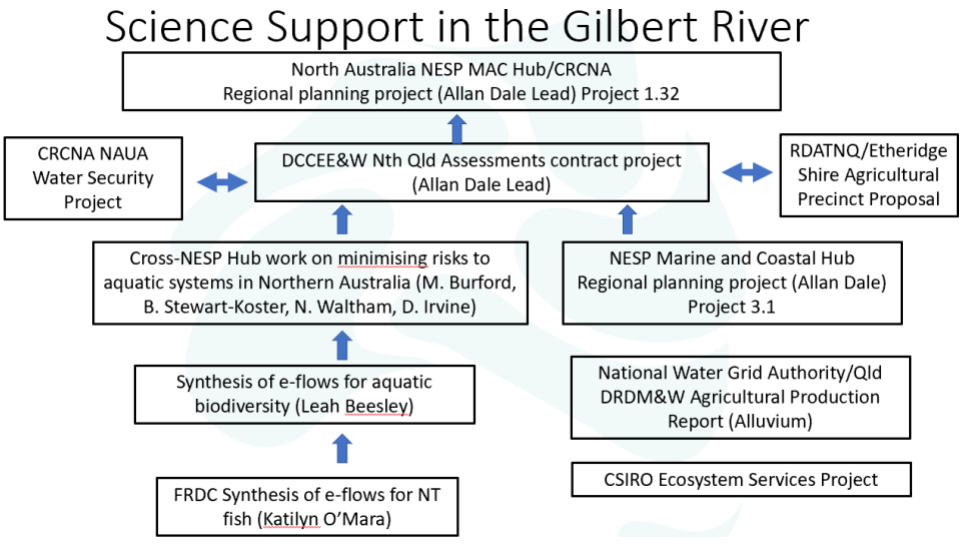


Figure 10: Emerging science projects of relevance to regional planning and development assessment in the Gilbert River catchment.

5.3 Stakeholder views of system function and improvements

Consistent with the more northern Australia-wide findings of Dale et al. (2022), the above GSA analysis again demonstrates that regional planning has many definitions and purposes within catchments such as the Gilbert; and that there is no single regional planning system in the catchment. Instead, the Gilbert is covered by a complex legislatively-driven system encompassing multiple sub-domains of regional planning effort (i.e., regional NRM planning, regional land use planning, regional infrastructure planning, etc.). These efforts are often sponsored at different scales of governance (i.e., by particular Commonwealth or state agencies or by the region itself).

Consequently, in targeted interviews in the Gilbert, participant responses were often based on people's individual interpretations of what constituted the local system of regional planning and development assessment. They were also influenced by their own organisation's particular roles and responsibilities. Accordingly, our synthesised review of the interview discussions below required broad thematic analysis to identify and interpret cross-cutting themes.

5.4 Thematic analysis emerging from the interviews

A total of 14 key regional stakeholders were interviewed to contribute to the wider GSA effort. Some of the key themes that emerged from people's views of the strengths of the current system are listed below, and the number of interviewees making this point is in brackets.

- there is real agricultural development opportunity (e.g. cotton, macadamias, pongamia) at scale, driven by very low water security in southern Australia and a new generation of more innovative agricultural businesses (4);
- all of the right regulatory arrangements are broadly in place and operating, with appropriate information through Queensland Globe (4);
- there are people, institutions and services available with the capacity to work complex integration concepts through the planning and development assessment system (4);
- most people in the system want to see genuine sustainable development outcomes (3);
- technology now exists to measure and support trading in soil carbon, water quality and biodiversity, in detail, at property and regional scales for accountability purposes (3);
- global markets are now demanding clear measured accountability for agricultural products, particularly in the case of cotton (3);
- there is national, bilateral and bipartisan recognition of the importance of a cohesive northern development policy agenda (1);
- there is the potential to explore cumulative impacts at the regional scale (2);
- there are regional examples of good diverse agricultural development (with a mix of corporate, medium and smaller producers from the south (e.g. Central Highlands) (1);
- the region has a strong, modelled understanding of the potential impact of water extraction on productivity in the Gulf and its impact on iconic species (1);

- there is community connectivity within the natural resource management sector (1);
- there is a strong framework for co-management of the Northern Prawn Fishery, including a mature industry-based capacity for planning, advocacy and self-regulation (1); and
- there are opportunities to build on the economic foundations of the communities of several small service towns with currently high overall unemployment, including of Indigenous people (1).
- Some of the key themes that emerged with respect to people's views of the weaknesses of the current system are as follows, once again with the number of interviewees mentioning this subject in brackets.
- the existence of institutional silos and fragmented regulation in the planning and assessment systems, resulting in conflicting signals to those involved in development (e.g. water versus vegetation) (9);
- a lack of cohesive capacity within particular sectoral interests (e.g. the NRM sector, traditional owners, local government, smaller fisheries) (7);
- a lack of political understanding of the issues facing Gulf communities, and potential risks of poor decision-making in periods of weak governance (5);
- conflicting visions of the future of sustainable development of the region (5);
- a lack of institutional and human capacity supporting Traditional Owners (3);
- a low capacity in the current pastoral community to undertake quality cropping development (3);
- a need to better embrace technology in finding solutions for the region (2);
- general regional inaccessibility for engagement and scientific activity (2);
- a system unresponsive to the economic decline of communities in the region and livability issues, making it hard to attract and retain services and staff (2);
- sectors such as mining, gas and renewables seem to have higher priority in the development assessment system than others (e.g. fisheries and agriculture) (2);
- the lack of a clear water development proponent (2);
- finding appropriate vegetation management offsets can be extremely difficult, along with other problems associated with offsetting, to internalise development impacts (2);
- high turnovers in staffing capacities across key agencies (2);
- insufficient information sharing and knowledge integration (2);
- insufficient thinking about how to integrate bio-regional and NRM planning (1);
- a non-adaptive focus on tree cover in isolation from productivity, landscape health and drought resilience within the *Vegetation Management Act* (1);
- political commitments to projects that are not viable (1);
- a general decline of agronomic, biosecurity and other support services (1);

- high costs inherent in the development approval system with a low chance of success (1);
- piecemeal investment into integrated natural resource management activity (1);
- a lack of investment in knowledge-based relationship building and science feedback (1);
- difficulties in finding information appropriate to building development applications (1);
- climatic extremes and livability within the region (1);
- the system is currently not sufficiently prepared to manage oil and gas disasters (1);
- tenure insecurity (1);
- regional people are frustrated by slow timeframes for development approval (1);
- a lack of capacity in the system to consider cumulative impacts (1); and
- a limited framework for improvement in agricultural practices (1).

Some of the key themes that emerged with respect to people's views about priorities for system improvement are listed below:

- bringing people together into a collectively-agreed, long-term, adaptive, multi-stakeholder and positive co-management model of development and planning, including a stronger governance platform for integrated decision-making and tradeoff analysis (13);
- the potential to drive measured offsetting within the region by building on effective measurement and reporting systems such as AgCare (6);
- clear bio-regional, precinct or mosaic planning that articulates development and protection zones and improved triggering arrangements for agricultural development (5);
- the potential value of making the *Vegetation Management Act*, together with the *EPBC Act*, work more effectively to balance economic and operational needs, perhaps through more innovative use of the Area Management Plans and Self Assessable codes (5);
- investment in the capacity of key sectors (e.g. Traditional Owners, Pastoral Sector, etc.) (5);
- integrated planning for water development (4);
- the need to resolve fragmented scientific effort, create more regional and community-based science partnerships, and undertake independent impact modelling and measurement of cumulative impacts, with a particular focus on impacts in aquatic ecosystems (4);
- building of a higher political understanding of the importance of the Gulf region, and better integrating local, State and Federal political leadership (3);
- legislative reform to simplify the planning and development assessment system (2);
- more integrated information management systems linked to the governance platform (2);

- effective measurement of regional metrics (water, carbon, biodiversity) including delivery at property scale (1);
- a need for stronger risk-management based models of enforceable rules that are monitored and backed by appropriate penalties (1);
- a need for different models in Traditional Owner engagement (1);
- more investment in relationship building across the system (1);
- a need for stronger scenario-based thinking and planning for the region (1);
- stronger independence needed within the impact assessment process (1);
- an engaged, double-loop learning environment needed to improve the system (1);
- a need to consider coming climate impacts in future development (1); and
- improved access to infrastructure and transport resilience is needed in Gulf region (1).

5.5 Implications from the combined results

This section has summarised the results from the broad GSA work from both the literature review and detailed interviews exploring the health of the governance system for regional planning and development decision-making in the Gilbert River catchment.

From this work, clear points are emerging regarding strengths and weaknesses within the system, as well as potential areas that might be prioritised for practical reform. Based on these results, the following discussion undertakes a synthesis of the key identified governance system problems and examines potential and practical system reforms to guide future efforts and thus influence better decision-making and sustainable development outcomes within the Gilbert River catchment.

These concepts will be developed in our subsequent Solutions Report associated with this project.

6 Discussion: Emerging regional planning system problems

By combining the results of the preliminary heat systems mapping of ecological attributes, the more detailed GSA work, and the stakeholder interviews, we have collectively identified several significant regional planning and development assessment system problems that, if left lingering, will result in the continued slow decline of environmental, cultural, and economic values in the region.

6.1 Highly competing and fragmented planning visions

The analysis presented above exposes a significant policy tension within the Gilbert catchment between:

- the key *EPBC Act* intent to protect key MNES, particularly in the context of the marine and estuarine estate, and the amount of water allocated for development in the Gilbert River;
- the current regulatory framework for vegetation management, its relationship to the *EPBC Act* and the wider intention of Federal and State policy to grow agriculture through existing northern development policies and water allocation plans; and
- the virtual absence of a cohesive investment in Traditional Owner nation-building to provide on-ground management capacity, and to ensure both the protection of cultural values within the estate and to achieve Closing the Gap outcomes.

There remains an implicit bias within this system towards resource development values, but equally, environmental protection values do not adequately signal viable models, options and areas for sustainable development. Without some form of cohesive, long-term and stable regional partnership building between the Commonwealth, State, Local Government, industry, environment sector and Traditional Owner institutions, two scenarios could, or are even likely to, emerge for the region:

- **Scenario 1: Continuing Economic Stagnation**
  This scenario includes continuing decline in the viability of existing pastoral and agricultural systems in the region, leading to long-term population decline and hardship for the region's farming families and local communities. The scenario suggests that Traditional Owners would also continue to struggle to achieve their longer-term nation building aspirations, and experience continued decline in their economic and social wellbeing. In this scenario, more limited, but less strategic management of the landscape would result in a continual slow decline of biodiversity values across the region due to factors such as climate change and invasive species; and

- **Scenario 2: Wild Card Development Risks**
  With poorly integrated Federal, State and Local policy frameworks guiding appropriate development, there always remains a risk that significant and highly unsustainable development proposals can emerge in the region. Such proposals can distract the efforts of all parties for long periods of time, and could, under certain political conditions, possibly even secure approvals, despite demonstrable potential for negative impacts. Such projects can inherently be politically unstable, nationally controversial, and ultimately unviable. This is indeed a disaster scenario for the environment, cultural values, and the region's long-term economic well-being.

With the right collaborative approach to improving the system of regional planning and development decision-making within the catchment, a third, more positive scenario is possible:

- **Scenario 3: Sustainable Development of the Gilbert Catchment.**
  This scenario envisages an active approach to resolving the significant tensions between major interests that utilise the significant water resources that have been allocated to consumptive use; and the avoidance of the very real current risk of cumulative impact and current ecosystem service declines. This scenario envisages well-planned, model development activity that halts and reverses the decline of rural communities in the region (including Georgetown, Mt Surprise, Forsayth and Einasleigh). At the same time, it envisages improved condition and a positive trend across the key biodiversity, water quality and cultural assets within the region through progressive and stable approaches to natural resource management directed through the region's local institutions, land managers and Traditional Owners.

Alarmingly, without effective collaborative improvements in the current regional planning system, the Gilbert River catchment is currently heading towards Scenarios 1 and/or 2.

Declining biodiversity conditions despite limited development

In the absence of any cohesive development or management model for the region, a range of pervasive landscape-scale influences are likely to continue to erode key biodiversity, economic and cultural values in the region. The key pressure or drivers include:

- climate variability/change and disaster risks;
- changing burning regimes;
- unsustainable grazing pressures;
- weed and feral biosecurity threats; and
- water extraction for existing and planned irrigated agriculture.

Despite the current lack of active development pressure, these corrosive changes are adding additional layers of risk within these ecosystems.

6.2 Knowledge of terrestrial, aquatic and marine interactions

The development of the *Water Plan (Gulf)*, completed in 2007, generally progressed in the absence of strong cultural, historical and scientific knowledge regarding the interactions between terrestrial, aquatic and marine environments in the Gilbert River, its catchment and the Gulf of Carpentaria. There is indeed very limited knowledge about the aquatic ecosystems in the catchment, with only several short studies linked to agricultural development (Waltham et al. 2013; Griffiths et al. 2014).

According to records, there are approximately 40 fish species in the freshwater sections of the catchment, while in the estuary/tidal regions a full species list is not available. The exception is research targeting commercial species (Plaganyi et al. 2023). However, the area has been demonstrated to include important feeding areas for critically endangered migratory shorebirds (Burford et al. 2021). Freshwater turtles (Figure 11) also occur in the catchment, along with various crustaceans and bivalves, and aquatic plant species, but the diversity of species present and their distribution is not known. These species also generally hold cultural values and require access to permanent waterholes during late dry season periods (Waltham et al. 2013).

Emerging recognition of these knowledge gaps reinforces the need to build more integrated knowledge-based relationships between development processes and water planning reviews. Very significant effort is now progressing through freshwater-related research currently being undertaken by the Northern Australian Universities Water Security Alliance (and funded by CRCNA). More marine-related and NESP-funded research is also progressing through Griffith University.

6.3 No cohesive framework for regional planning and trade-off analysis

The above findings suggest that there is a very significant need for more knowledge-based and engaged trade-off analysis regarding these key tensions between development, water availability, vegetation management, terrestrial vegetation management and estuarine and marine health. This would extend the trade-off analysis undertaken in a previous NESP project on the value of freshwater flow from rivers in the southeast Gulf of Carpentaria for agricultural development versus fisheries (Smart *et al.* 2021). There are, however, no active or available policy and planning frameworks to enable this to occur, despite the opportunities available through more regional-scale place-based approaches as envisaged through the *SDPWOA* and the *EPBC Act*. In particular, as recognised by the Bradfield Regional Assessment Panel (2022), there is a higher-level deficit in policy and planning instruments for effective water development planning in the north.

Figure 11: Saw-shelled turtle captured in Elizabeth Creek, Gilbert catchment (N. Waltham, Tropwater, JCU).

6.4 Poorly conceptualised ecosystem service offset and market frameworks

One of the key reasons the region faces continuing biodiversity risks, productivity reductions and social decline is that there is no clear framework for effective alignment of multiple government, market and corporate environmental markets, or social and governance (ESG) efforts directed towards targeted improvement of biodiversity, water quality and socio-cultural values in the region.

The original intent of significant reforms in the regional NRM sector in the early 2000s, contributed to important inroads towards establishing a strong regional NRM plan, a designated regional NRM body and stable long-term investment framework (via a five-year Regional Investment Strategy). While only in its infancy at that time, if well fostered and institutionalised for the long-term, the Gulf region could have, by now, had a very strong framework for:

- planning (spatially) the long-term priorities and actions for maintaining or improving values;
- establishing long-term delivery frameworks regionally, through capable delivery institutions, including pastoral stations and emerging traditional owner-based ranger groups; and
- regional mechanisms for aggregating, guiding and delivering effectively on market options.

Unfortunately, the original intended design of the regional NRM system began deteriorating from 2009, when strong policy-centric and bilateral approaches to regional NRM were fractured by new funding approaches. Since that time, the regional NRM system has been relegated a role focused on providing a government-service delivery model. Incidentally, within that time period, the wider range of potential investment options that could support ecosystem service delivery into the region has expanded massively and, will continue to grow (e.g. through the ongoing emergence of carbon and biodiversity markets). These options include some of the many and varied government programs, as well as regulated and voluntary ecosystem service markets. In the context of the Gilbert River, these at least include:

- the Federal National Landcare Program;
- Federal Farm Stewardship Programs;
- State Regional NRM investment Programs;
- the Federal Emission's Reduction Fund (ERF);
- regulated offsets under the EPBC;
- regulated offsets under the Queensland *Vegetation Management Act*;
- emerging global community and biodiversity-based standard-based offset markets;
- global and national philanthropic investment markets;
- emerging corporate ESG obligations (globally to locally); and
- the voluntary efforts of local landholders (recognising the economic value of biodiversity).

Critical factors will ensure extremely limited alignment of these investment markets towards the long-term and capable delivery of landscape-scale management. These include:

- a lack of a clear, landscape-scale plan prioritising those parts of the landscape where long-term and cohesive management action is required, and this includes the progression of the government service, market and offset-based investment mechanisms outlined above in ways that integrate the intent of multiple-species based recovery plans;
- the lack of integrated systems for the mobilisation and brokerage of both the supply and demand sides of these investment opportunities within the catchment;
- the lack of stable investment in capable landscape-scale management delivery mechanisms, either through Indigenous ranger groups, capable landscape-scale restorative ecology delivery-teams, or empowered pastoral land managers; and
- capable regional-scale condition and trend progress reporting achieved through investment.

Additional to these problems is the reality that, as the region remains a fully vegetated landscape, there is no real scope to offset any approved vegetation clearing with local restoration of equivalent regional ecosystems. The scope exists, however, with the above framework in place, for approved clearing offsets (in the right places and at the right scales) that reinvest in improved ecosystem health in priority parts of the landscape, reducing the long-term regional decline of key values.

6.5 Capacity limitations for regional engagement of multiple sectors

Any attempt at improving regional planning for development assessment in the region would need to be fundamentally partnered by the region's local governments, the resources and agricultural sectors, Gulf Savannah NRM, Traditional Owner institutions and their representative bodies and the research community. It must also invest in and support the planning and engagement capacity of both Traditional Owners and farmers.

Currently, there is no cohesive approach to lifting these capacities. This means there is a significant disincentive for all sectors to engage meaningfully in new and innovative regional approaches to planning, improved development assessment and ecosystem service markets. Long-term and cohesive approaches to resolving such issues have been trialed and evaluated in the past, for example, nationally-funded experiments to improve regional rangelands management funded by the Land and Water Resources Research and Development Corporation (LWRRDC) via the Central Highlands Regional Resource Use Planning experiment in Queensland's Central Highlands (Dale 2014).

6.6 Limited strategic investment in traditional owner nation building

With Traditional Owners in the region progressing towards finalisation of their native title and Queensland *Aboriginal Land Act* claim and determination processes, the opportunity now exists for substantive social, economic and cultural revival of First Nations within the region. Strong aspirations exist among all three groups to progress Indigenous nation building in this context; a vision that many groups in Queensland wish to see advanced through cohesive development of their governance institutions and the long-term development and implementation of associated people and country plans.

The Kirtijar, Ewamian, and Tagalaka Peoples have all prioritised sustainable economic development whilst also protecting and managing the region's cultural and environmental values as demonstrated by current and emerging country-based planning and ranger programs (Ewamian Limited 2022, Kurtijar People & CLCAC, 2014, TAC 2020, 2021). Despite these aspirations, there are few cohesive mechanisms to support such approaches. This leaves Traditional Owners in a weak position to manage the country that they have firm rights to, as well as diminishing their capacity to be engaged in management of the wider landscape.

7 Next steps and conclusions

This sentinel case study approach in the Gilbert River catchment has explored priorities for more regionally-based approaches to improve the systems of planning and development decision-making.

There is collective value in paying greater attention to the Gilbert River catchment because of the high biodiversity and cultural values, and the significant pressures of pending development. While not yet realised, these development pressures, if poorly managed, could result in very poor environmental, cultural, social and economic outcomes for the region, as well as lost opportunities.

Based on our exploratory consideration of the biodiversity heat mapping approaches and the outlined more detailed approaches to the regional application of GSA, we have been able to identify a more systemic view of the problems facing future decision-making aimed at achieving sustainable development outcomes in the Gilbert.

It is hoped that progression of the identified steps above enables a strong, long-term and collaborative approach to resolving these problems. Real progress, however, will be needed in growing the strength of partnerships between the Commonwealth, the State, the Gilbert catchment community and the CRCNA/NESP Hub Teams.

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Appendix 1: Governance Systems Analysis Summary

The Natural Resource Management Domain

1 The Commonwealth Biodiversity Protection Sub-Domain

In the Commonwealth context, biodiversity is primarily managed through the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). The objects of this Act are to:

- provide for the protection of the environment, especially those aspects that are Matters of National Environmental Significance (MNES);
- promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;
- promote the conservation of biodiversity;
- provide for the protection and conservation of heritage;
- promote a cooperative approach to the protection and management of the environment involving governments, the community, landholders and Indigenous peoples;
- assist in the cooperative implementation of Australia's international environmental responsibilities;
- recognise the role of Indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity; and
- promote the use of Indigenous peoples' knowledge of biodiversity with the involvement of, and in cooperation with, the owners of the knowledge.

To achieve its objects, the Act:

- recognises an appropriate role for the Commonwealth in relation to the environment by focussing its involvement on MNES and on actions and activities in Commonwealth areas;
- strengthens intergovernmental cooperation and minimises duplication through bilateral agreements;
- provides for the intergovernmental accreditation of environmental assessment and approval processes;
- adopts an efficient and timely Commonwealth environmental assessment and approval process to ensure that activities with significant impacts are properly assessed;
- enhances Australia's capacity to ensure the conservation of its biodiversity by including provisions to protect native species (and in particular prevent the extinction and promote the recovery of threatened species) and ensure the conservation of migratory species;

- establishes an Australian Whale Sanctuary to ensure the conservation of whales and other cetaceans;
- protects ecosystems by means that include the establishment and management of reserves, the recognition and protection of ecological communities and the promotion of off-reserve conservation measures;
- identifies processes that threaten all levels of biodiversity and implement plans to address these processes;
- includes provisions to enhance the protection, conservation and presentation of world heritage properties and the conservation and wise use of Ramsar wetlands of international importance; and
- includes provisions to identify places for inclusion in the National Heritage List and Commonwealth Heritage List and to enhance the protection, conservation and presentation of those places.

Of particular importance to its relationship with Queensland, the Act promotes a partnership approach to environmental protection and biodiversity conservation through bilateral agreements with States and Territories. It can also encourage conservation agreements with land-holders. It also aims to recognise and promote the role of Indigenous peoples and their knowledge in the conservation and ecologically sustainable use of biodiversity. The Act also seeks the involvement of the wider community in biodiversity management planning.

A statutory review of the *EPBC Act* commenced on 29 October 2019 and publicly released its final report on 28 January 2021 recommending amendment of the Act to include National Environmental Standards, amongst other things. In the Regional Ministerial Budget Statement 2023 – 24, the Australian Government committed $34.0 million over 2 years to help implement the findings of the EPBC Act review, including to develop initial National Environmental Standards, deliver the nature positive package of legislation, and provide critical guidance for protecting threatened species and ecosystems (DITRDCA, 2023). Under these arrangements, new approaches to regional planning are expected to speed up decision-making and deliver 'nature positive' outcomes at a landscape scale, including cumulative impacts. Regional plans will enable active management of landscapes, oceans, waterways and places through a three-level ('traffic light') spatial system. These could include:

- *Areas of High Environmental Value*, where development will largely be prohibited;
- *Areas of Moderate Environmental Value*, where development will be allowed, subject to an approval process and any agreed rules; and
- *Development Priority Areas*, where the planning process has determined development can proceed without a separate Commonwealth environmental approval.

Once regional plans are in place, individual projects would need to demonstrate plan compliance.

Operation of the sub-domain in the Gilbert

EPBC Act Bilateral Agreement

The bilateral agreement between the Commonwealth of Australia and the State of Queensland relating to environmental assessment, allows the Commonwealth Minister for the Environment to rely on specified State of Queensland environmental impact assessment processes to assess actions under the EPBC Act. The objectives of the bilateral agreement are to:

- provide for the protection of the environment, and ensure high environmental standards;
- promote the conservation and ecologically sustainable use of natural resources;
- ensure an efficient, timely and effective process for environmental assessment and approval of actions; and
- minimise duplication in environmental assessments.

There are current Administrative Arrangements that set out how they work together to ensure the environmental impact statement (EIS) assessment process is effective for each project. The Queensland Department of Environment and Science is responsible for the Administrative Arrangements for all EIS assessments conducted under Chapter 3, of the *Environmental Protection Act 1994* (Qld).

The bilateral agreement applies to proposals that are 'controlled actions' requiring assessment under Part 8 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and which are undergoing an EIS assessment process under:

- Chapter 3, Part 1 of the *Environmental Protection Act 1994* (Qld); or
- Part 4 of the *State Development and Public Works Organisation Act 1971* (Qld).

The bilateral agreement only covers the assessment process requirements. The Commonwealth Government retains its separate approval powers under Part 9 of the *EPBC Act*.

Relevant MNES

Not all MNES are applicable to the Gilbert River catchment as not all of these exist within the catchment. Two MNES that are highly applicable are:

- nationally threatened species and ecological communities; and
- migratory species.

Key MNES that are not relevant to the Gilbert River catchment are:

- wetlands of international importance;
- the Great Barrier Reef Marine Park and other World Heritage properties;
- National Heritage places and Commonwealth marine areas;
- nuclear actions (including uranium mines); and
- water resources in relation to coal seam gas and large coal mining development.

A detailed Protected Matters Report that describes the Gilbert River catchment MNES has been developed as part of this research. Further, no Traditional Use of Marine Resources Agreements (TUMRA) or Indigenous Protected Areas (IPA) have yet been developed under the EPBC Act anywhere in the Gilbert River catchment or Gulf waters adjacent to the Gilbert. However, there are currently two IPA consultation projects in process: a Kurtijar Sea Country IPA proposal by Carpentaria Land Council, in south-east Gulf of Carpentaria between the Norman River region and the Staaten River, which includes the coastal area of the Gilbert catchment; and, the Talaroo IPA sought by the Ewamian People Aboriginal Corporation.

The northern Marine Bioregional Plan, prepared pursuant to the EPBC Act, applies to Commonwealth waters of the Gulf of Carpentaria. The plan does not cover Queensland waters but, where relevant, does include information about inshore environments and the way they interact with species and habitats of the Commonwealth marine area.

Key emerging sub-domain strengths and challenges for sustainable development

While the *EPBC Act* presents a strong framework for biodiversity protection nationally, key challenges facing the operation of the Act in the Gilbert include:

- the lack of a bio-regional planning framework in the catchment;
- the limited data available for effective development assessment in the catchment;
- the general physical and relational disconnect between Commonwealth assessment staff based beyond the immediate region;
- the lack of cohesive offset policy frameworks in fully vegetated landscapes;
- duplication between the operation of the EPBC Act and Queensland planning and development assessment systems;
- the limited capacities of regional organisations, local Councils, communities, Traditional Owners, and land managers to engage effectively in development assessment process; and
- the limited capacities of Regional NRM Bodies, local Councils, Traditional Owners, and land managers to be engaged in long-term biodiversity management programs and activities.

Priorities for sub-domain improvement

As also discussed in the Vegetation Management Sub-domain, to resolve the conflicts between limited capacity to clear vegetation in the Gulf region, and significant amounts of water available for agricultural development, a stronger bio-regional planning framework may need to be applied. Any cohesive agricultural development plan may need to be considered as a coordinated project under the context of the Queensland *State Development and Public Works Organisation Act 1971* (Qld).

2 Queensland Vegetation Management Sub-Domain

Vegetation in Queensland is primarily managed under the *Vegetation Management Act 1999* (Qld) (VMA). The primary purpose of the Act is to regulate vegetation clearing in a way that conserves remnant vegetation that is an endangered regional ecosystem, an 'of-concern' regional ecosystem, or a 'least concern' regional ecosystem. It also seeks to conserve vegetation in declared areas, and ensures that clearing does not cause land degradation nor loss of biodiversity, maintains ecological processes, reduces greenhouse gas emissions, and allows for sustainable land use.

These purposes of the Act are achieved mainly by providing assessment benchmarks for the Queensland *Planning Act 2016* which evaluates assessable developments that involve vegetation clearing. This can mean assessment against a development application, or having regard to the enforcement of vegetation clearing provisions.

In general, the precautionary principle applies in that the lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment if there are threats of serious or irreversible environmental damage and in the regulation of particular regrowth vegetation.

Grazing of vegetation by cattle is known to contribute to biodiversity decline, however the Act does not regulate this type of vegetation management.

Operation of the Sub-Domain in the Gilbert

Key vegetation types have been mapped for the Gilbert River catchment. The vast majority of the Gilbert River catchment is Regulated Vegetation Management Category B (Remnant Vegetation). Remnant Vegetation is not permitted to be cleared except under limited circumstances. In this context, development assessments are now subject to regulated vegetation management considerations. If a project is declared a coordinated project under section 26 of the *State Development and Public Works Organisation Act 1971* it may be considered as development for a relevant purpose, and in this case, development approval can be applied for under the Planning framework if required. The VMA Minister may make an Accepted Development Vegetation Clearing Code to permit vegetation clearing where it is considered necessary or desirable for achieving the purpose of the VMA. This provision has not yet been used for coordinated projects.

Key emerging sub-domain strengths and challenges for sustainable development

Regulated vegetation is well protected from broad scale clearing and this conserves the structural vegetated landscape. This also contributes to the prevention of biodiversity loss and the maintenance of ecological processes in the Gilbert catchment. There is also, however, some level of regionally-based duplication in decision-making in relation to the consideration of vegetation protection under the Commonwealth EPBC.

The *Vegetation Management Act 1999*, however, does not have ecologically sustainable development as a clear objective. While significant agricultural development planning has potentially been enabled under the Gulf Water Plan by making significant volumes of water available, the *Vegetation Management Act 1999* deeply constrains this opportunity, leading to significant tensions over the future development of the region. As such, the restriction of agricultural activities that require vegetation clearing contribute to social and economic problems.

Priorities for sub-domain improvement

To resolve the major conflicts between limited capacity to clear vegetation in the Gulf region, and significant amounts of water available for agricultural development, a stronger bio-regional planning framework may need to be applied. Within this context, a cohesive catchment-scale development plan may need to be considered as a coordinated project under the guidance of the Queensland *State Development and Public Works Organisation Act*.

3 The Queensland Nature Conservation Sub-Domain

Decision-making about nature conservation in Queensland is driven under the *Nature Conservation Act 1992* (Qld) (NCA). The core object of this Act is the conservation of nature (primarily through protected area and wildlife management) while allowing for the involvement of Indigenous people in the management of those things in which they have an interest under tradition or custom.

The conservation of nature is to be achieved by an integrated and comprehensive conservation strategy for the whole of the State that involves information gathering and community education. This includes: research, analysis, monitoring and the dissemination of information on nature, the identification of critical habitats and areas of major interest, and the encouragement of conservation of nature via education and the cooperative involvement of the community, particularly landholders.

The Act enables the dedication and declaration of protected areas which are representative of biological diversity, natural features, and wilderness values. It allows for the management of these protected areas in accordance with the agreed management principles, plans, agreements, and programs. Primarily, the management of protected areas needs to have regard to any management statement for the areas concerned. The Act also caters for the protection of native wildlife and its habitat through: the dedication and declaration of protected areas; the prescribing of protected and prohibited wildlife; the management of wildlife in accordance with the management principles; and, the declaration of management intent, any conservation plan or the entering into of conservation agreements.

The Act also provides for the ecologically sustainable use of protected wildlife through the preparation and implementation of management and conservation plans consistent with the values and needs of the wildlife or areas concerned. These might particularly relate to protected areas, the taking or use of wildlife, protected wildlife and its habitat and critical habitats and areas of major interest. It also provides for the ecologically sustainable use of protected areas through the preparation of management statements.

The Act seeks recognition of Aboriginal and Torres Strait Islander people's highly valued cultural association with nature and wildlife and their cooperative involvement in its conservation through management and protected areas.

The marine equivalent of the NCA is the *Marine Parks Act 2004* (Qld). It provides a framework for the creation of marine parks and the protection of marine species.

Operation of the sub-domain in the Gilbert

Several protected areas have been declared under the NCA in the Gilbert River catchment, including Blackbraes National Park, Rungulla National Park, Littleton National Park, Undarra Volcanic National Park, and Bulleringa National Park (which is fractionally within the Gilbert catchment). Several resource reserves and nature refuges have also been declared within the Gilbert River catchment.

MNES that are a component of the State biodiversity interest have also been identified for the Gilbert River catchment area, recognising matters that have been protected under the *Nature Conservation Act 1992* and other Queensland legislation.

Key emerging sub-domain strengths and challenges for sustainable development

The establishment of significant protected areas in the region is of importance to key outcomes envisaged by the Commonwealth's EPBC Act. The Nature Conservation Act 1992 also has the conservation of nature, not ecologically sustainable development, as its object. As such, without effective bioregional planning and improved arrangements for development assessment, this can lead to tension between development and conservation aspirations in the region.

Priorities for sub-domain improvement

As with the Vegetation Management Sub-domain, to resolve the major conflicts between the limited capacity to clear vegetation in the Gilbert catchment, and significant amounts of water available for agricultural development, a stronger bio-regional planning framework may need to be applied. Again, within this context, a cohesive development plan may need to be considered as a coordinated project under the guidance of the Queensland SDPWOA.

4 The Queensland Coastal Protection and Management Sub-Domain

Across Queensland, coastal protection and management is achieved through the *Coastal Protection and Management Act 1995* (Qld) (CPMA). The main objects of this Act are to:

- provide for the protection, conservation, rehabilitation, and management of the coastal zone, including its resources and biological diversity;
- have regard to the goal, core objectives and guiding principles of the National Strategy for Ecologically Sustainable Development in the use of the coastal zone;
- ensure decisions about land use and development can safeguard life and property from the threat of coastal hazards; and
- encourage the enhancement of knowledge of coastal resources and the effect of human activities on the coastal zone.

It is intended that the objects of this Act are to be achieved by coordinated and integrated planning and decision-making, involving, among other things:

- defining the coastal zone (or the area to which this Act applies);
- preparing coastal plans that identify coastal resources and state policies for coastal management − these plans are to be developed in consultation with the public and have regard for the traditions of Aboriginal people and Island-custom of Torres Strait Islanders;
- declaring coastal management districts in the coastal zone as areas requiring special development controls and management practices;
- declaring erosion prone areas in the coastal zone as areas where particular development requirements are applied;
- the use of other legislation wherever practicable to achieve the objects of this Act; and
- monitoring, reporting and reviewing to support the chief executive to prepare and publish a report on the state of the coastal zone on a regular basis.

The Queensland Coastal Management Plan provides non-regulatory, best practice coastal management guidance for implementation of the *Coastal Protection and Management Act 1995*. The Plan is primarily aimed at local government, which is responsible for managing large areas of public coastal land and beaches. However, other organisations with responsibility for managing coast and tidal water (port authorities, natural resource management groups, Traditional Owners) may also find the plan useful to guide their coastal management activities.

The Coastal Management Plan does not address land-use planning or development regulated under the *Planning Act 2016*, rather it applies to management planning, activities, decisions and works that are not assessable development, and therefore not subject to the State Planning Policy for Coastal Protection (SPP).

Operation of the sub-domain in the Gilbert

Coastal management districts are declared under the *Coastal Protection and Management Act 1995* where a coastal area is considered to need protection or management, especially with respect to the area's vulnerability to erosion, value in maintaining or enhancing coastal resources, or for planning and development of the area. A coastal management district has been declared for all the Gilbert catchment coastal area to a distance of approximately 30 kilometres inland from the shore and offshore the boundary of Queensland state waters.

Carpentaria Shire Council is responsible to manage this coastal district consistent with the *Coastal Protection and Management Act 1995 and the Queensland Coastal Management Plan*. This management responsibility is reflected in the *Carpentaria Shire Council Planning Scheme* and influences development assessment in the coastal management district.

Key emerging sub-domain strengths and challenges for sustainable development

The *Coastal Protection and Management Act 1995* does have regard for ecologically sustainable development as a core objective, making it valuable in regard to the basic protection of coastal resources, while considering social and economic issues. There have, however, also been limited development pressures on the coastal zone in the Gilbert. The Coastal Management Plan, however, only provides non-regulatory best practice coastal management policies.

Priorities for sub-domain improvement

With limited development pressure in the coastal zone, there are no immediate priorities for improved coastal planning and regulatory protection. Much could be done, however, in improving the management of biodiversity and cultural values in coastal areas. This would be particularly enhanced through strengthening the governing capacity of First Nations' institutions in the region.

5 The Queensland Cultural Heritage Sub-Domain

Both Commonwealth and State legislation protect cultural values in Queensland. Queensland's primary legislative functions in relation to Aboriginal cultural heritage protection and management are carried out through the *Aboriginal Cultural Heritage Act 2003* (Qld) (ACHA). The main purpose of the Act is to provide effective recognition, protection, and conservation of Aboriginal cultural heritage. The key principles that underlie this Act's main purpose include:

- the recognition, protection and conservation of Aboriginal cultural heritage based on respect for Aboriginal knowledge, culture, and traditional practice;
- Aboriginal people recognised as the primary guardians, keepers, and knowledge holders of Aboriginal cultural heritage;

- the knowledge, innovations, and practices of Aboriginal communities recognised, respected, preserved and maintained, and understanding of cultural heritage promoted;
- recognition that the activities involved in practice, protection and conservation of Aboriginal cultural heritage are important because they allow Aboriginal people to reaffirm their obligations to 'law and country'; and
- recognition of the need to establish timely and efficient processes for the management of activities that may harm Aboriginal cultural heritage.

For achieving effective recognition, protection and conservation of Aboriginal cultural heritage, this Act provides for:

- recognising that Aboriginal ownership of Aboriginal human remains, wherever they are held;
- recognising Aboriginal ownership of Aboriginal cultural heritage of a secret or sacred nature that is held in State collections;
- recognising ownership by an Aboriginal party for the area, of Aboriginal cultural heritage that is lawfully taken away from an area;
- establishing a duty of care for activities that may harm Aboriginal cultural heritage;
- establishing relevant powers of protection, investigation, and enforcement;
- establishing a database and a register for recording Aboriginal cultural heritage;
- ensuring Aboriginal people are involved in processes for managing the recognition, protection, and conservation of Aboriginal cultural heritage;
- establishing a process for the comprehensive study of Aboriginal cultural heritage; and
- establishing processes for the timely and efficient management of activities, to avoid or minimise harm to Aboriginal cultural heritage.

The Act establishes a duty of care that requires all land users to take all reasonable and practicable measures to ensure their activities do not harm Aboriginal cultural heritage. Consultation with the Aboriginal parties for an area may be necessary if there is a high risk that the activity may harm Aboriginal cultural heritage. The cultural heritage duty of care can be met by acting:

- in compliance with gazetted cultural heritage duty of care guidelines;
- under an approved Cultural Heritage Management Plan (CHMP) developed under the Act; and
- under a native title agreement or another agreement with an Aboriginal party, unless cultural heritage is not subject to the agreement.

Also of importance is the *Queensland Heritage Act 1992* (Qld) (QHA), which provides for the protection of non-Indigenous heritage. The Act's object is to provide for the conservation of the State's heritage for the benefit of the community and future generations. This is primarily to be achieved by:

- establishing the Queensland Heritage Council;
- keeping a register of places and areas of State cultural heritage significance called the Queensland Heritage Register;
- requiring the reporting of the discovery of archaeological artefacts and underwater cultural heritage artefacts;
- providing for the identification and management of places of local cultural heritage significance by local governments;
- regulating, in conjunction with other legislation, any development affecting the cultural heritage significance of Queensland heritage places;
- providing for heritage agreements to encourage appropriate management of Queensland heritage places; and
- providing for appropriate enforcement powers to help protect cultural heritage.

In exercising powers conferred by this Act, the Minister, the chief executive, the council and other persons and entities concerned in its administration must seek to achieve:

- the retention of the cultural heritage significance of the places and artefacts to which the Act applies; and
- the greatest sustainable benefit to the community from those places and artefacts consistent with the conservation of their cultural heritage significance.

The purpose of the Commonwealth's *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth) (ATSIHP Act) is the preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters that are of particular significance to Aborigines in accordance with Aboriginal tradition. The Act enables the Australian Government to protect cultural heritage under threat, if state laws have failed to do so.

The Commonwealth's *Protection of Movable Cultural Heritage Act 1986* purpose is to protect Australia's heritage of movable cultural objects, to support the protection by foreign countries of their heritage of movable cultural objects, and for related purposes. The EPBC Act protects the National Heritage List, which includes natural, Indigenous, and historic places that are of outstanding heritage value to the nation.

Operation of the sub-domain in the Gilbert

An Aboriginal and Torres Strait Islander cultural heritage database and cultural heritage register have been established for Queensland. The cultural heritage register contains publicly available information about cultural heritage studies, cultural heritage management plans, designated landscape areas, registered cultural heritage bodies, and statutory Aboriginal and Torres Strait Islander parties for an area, and includes such information relevant to the Gilbert catchment.

The cultural heritage database contains information about cultural heritage sites and places including geographical location details, reports, site cards, images, and other documentation. Information in the database is not available to general public but can be provided to land users if it is necessary for them to satisfy their cultural heritage duty of care.

Pursuant to the Aboriginal Cultural Heritage Act 2003, the Tagalaka Aboriginal Corporation RNTBC is the registered Cultural Heritage Body for an area west of the Gilbert River upstream of its junction with the Einasleigh River (covering an area of less than 10 per cent of the Gilbert River catchment). There is no other registered Aboriginal Cultural Heritage Body for the Gilbert catchment.

Key emerging sub-domain strengths and challenges for sustainable development

The limited extent of development and land clearing in the Gilbert catchment, and the strong association of Traditional Owners with country within this region suggests that Aboriginal cultural heritage values (both physical and spiritual) are likely to be reasonably intact. There are strong Aboriginal associations with cultural values across the entire catchment. The extensive determinations of native title throughout the Gilbert catchment, and the subsequent establishment of RNTBCs, now provide corporate structures with potential to satisfy the objects of the Act to provide for the effective recognition, protection, and conservation of Aboriginal cultural heritage.

There has, however, been limited support and investment in Indigenous institutions to enable the identification, protection, and management of these values. The existing cultural heritage database and cultural heritage register will not include a comprehensive record of Aboriginal cultural heritage in the Gilbert catchment and planning instruments, such as the Etheridge and Carpentaria local government planning schemes, do not include complete cultural heritage mapping layers.

Priorities for sub-domain improvement

With only the Tagalaka Aboriginal Corporation RNTBC registered as an Aboriginal Cultural Heritage Body, much capacity building is needed to support Aboriginal-led protection of cultural values. Over 90 % of the Gilbert catchment is not represented by an Aboriginal cultural heritage body, so engagement for cultural heritage management purposes can be constrained, and especially so for those parts of the catchment where native title has not yet been determined.

6 The Queensland Water Quality Sub-Domain

The protection of water quality in Queensland and the Gilbert Catchment is mainly achieved through the context of the *Environmental Protection Act 1994* (Qld) (EPA). The object of the Act is to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (ecologically sustainable development). In general, the Act is to be achieved by the protection of Queensland's environment through an integrated management program that is consistent with ESD. The program is cyclical and involves:

- establishing the state of the environment and defining environmental objectives;
- developing effective environmental strategies;
- implementing environmental strategies and integrating them into efficient resource management; and
- ensuring accountability of environmental strategies.

Within this context, the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* was developed to achieve the objectives of the Act. The policy was prepared in accordance with Section 4.5 of the Act, delivering its objectives in relation to waters and wetlands (i.e., protecting Queensland's water environment while allowing for development that is ecologically sustainable).

The policy applies to waters and wetlands by:

- identifying environmental values for waters and wetlands to be enhanced or protected;
- identifying management goals for waters;
- stating water quality guidelines and water quality objectives for enhancing or protecting the environmental values for waters;
- providing a framework for making consistent, equitable and informed decisions about waters; and
- monitoring and reporting on the condition of waters.

The consequent *Environment Protection Policy for Water (EPP Water*) includes a process for:

- identifying environmental values (EVs) of waterways, including both aquatic ecosystem values, and human use values; and
- establishing corresponding water quality objectives (WQOs) such as pH, nutrients, and toxicants, (also known as targets) to protect identified EVs − achieving the identified WQOs for a waterway means the corresponding environmental values and uses of that waterway will be protected.

Under the EPP Water, the Queensland Water Quality Guidelines inform the setting of water quality objectives required to protect or enhance environmental values for Queensland waters. They also provide government and the general community (including catchment/water managers, regulators, industry, consultants, and community groups) guidelines for assessing and managing ambient water quality. The Queensland Water Quality Guidelines (QWQG) are intended to address the need identified in the ANZECC Guidelines (2000) by providing guideline values (numbers) that are tailored to Queensland regions and water types. They also provide a process/framework for deriving and applying more locally specific guidelines for waters in Queensland.

Another water quality relevant legislation is the *Soil Conservation Act 1986* (Qld) which consolidates and amends the law relating to the conservation of soil resources and facilitates the implementation of soil conservation measures by landholders for the mitigation of soil erosion.

Operation of the sub-domain in the Gilbert

EVs and WQOs are being progressively determined for Queensland waters but have not yet been determined for the waters of the Gilbert River catchment. Until EVs and WQOs are determined specifically for the catchment, there will remain limited focus on the effective management and monitoring of water quality issues in the catchment.

Key emerging sub-domain strengths and challenges for sustainable development

The lack of determined EVs and WQOs in the Gilbert is a major gap in information and planning guidance that is an impediment to effective management of Gilbert River water quality issues and to assessment of the potential effect of proposed development on the Gilbert River.

Priorities for sub-domain improvement

Before any significant development occurs in the Gilbert Catchment, there would be considerable value in developing clear EVs and WQOs for the catchment.

7 The Water Quantity Sub-Domain

The allocation of water in Queensland is primarily managed through the Queensland *Water Act 2000* (Qld). The primary purposes of the Act, and their achievement, are to provide a framework for:

- the sustainable management of Queensland's water resources and quarry material through the establishment of a system for the planning, allocation and use of water, the allocation of quarry material, and riverine protection;
- sustainable and secure water supplies, and demand management, for the south-east Queensland region and other designated regions;

- the management of impacts on underground water that result from the exercise of underground water rights by the resource sector; and
- the effective operation of water authorities.

Under the Act, sustainable management is considered to:

- incorporate the principles of ecologically sustainable development;
- allow for the allocation and use of water resources and quarry material for the economic, physical, and social wellbeing of communities, within limits that can be sustained indefinitely;
- sustain the health of ecosystems, water quality, water-dependent ecological processes and biological diversity associated with watercourses, lakes, springs, aquifers, and other natural water systems, including, where practicable, reversing any degradation;
- recognise the interests of Aboriginal people and Torres Strait Islander people and their connection with water resources;
- enable water resources and quarry material obtainment through fair, transparent, and orderly processes to support the economic development of Queensland;
- build confidence regarding the availability, security and value of water entitlements and other authorisations;
- promote the efficient use of water through the establishment and operation of water markets, or the initial allocation of water or the regulation of water use, if there is a risk of land or water degradation;
- increase community understanding of the need to use and manage water in a sustainable way; and
- facilitate the community participation in planning for the management and allocation of water.

Commonwealth investment

The expansion of the National Water Grid Fund Investment Framework in the 2022 October Budget allowed for new investments for delivery of essential town water supplies in regional and remote communities and delivered $811 million for water security projects in the regions.

Building on this investment, the Regional Ministerial Budget Statement 2023 - 24 Budget delivers additional investments under the National Water Grid Fund, with $197.1 million allocated (over 6 years) towards the construction of 3 projects to provide safe and reliable water for regional and remote communities. A further $150 million has been allocated towards First Nations' water infrastructure projects (DITRDCA 2023).

Operation of the sub-domain in the Gilbert

The Water Plan (Gulf) 2007 has been prepared pursuant to the *Water Act 2000,* and applies to planning, allocation, and use of water within the Gilbert River catchment. The plan will be in force until 1 November 2027 and will be reviewed prior to this date. As part of the Gulf Water Plan (2007) review, new hydrological and ecological modelling are undertaken to determine the total amount of water in the plan area and to set environment flow objectives and outcomes. Climate Change and First Nations aspirations (cultural and economic) for water will also be included.

The core purpose of the Water Plan (Gulf) 2007 is to:

- define the availability of water in the plan area;
- provide a framework for sustainably managing water, including extraction;
- identify priorities and mechanisms for dealing with future water requirements;
- provide a framework for establishing Supplemented Water Allocations (surface);
- provide a framework for reversing, where practicable, degradation that has occurred in natural ecosystems;
- regulate the taking of overland flow water; and
- regulate the taking of groundwater.

The Water Plan (Gulf) 2007 identifies a total of 814,332 megalitres of unallocated water across eight separate catchments Gulf river catchments. These are classified into three water reserves: Indigenous unallocated water (known as the Indigenous reserve); strategic unallocated water; and, general unallocated water.

The *Gulf Indigenous water reserve* totals 30,550 ML, including 17,000 ML from the Gilbert River catchment. It may be granted only for helping Indigenous communities within the following areas to achieve their economic and social aspirations: Cape York Peninsula Region, Flinders River catchment, Gilbert River catchment, Mornington Inlet catchment, Settlement Creek catchment, Staaten River catchment, and Gregory River sub catchment.

The *Gulf strategic unallocated water reserve* totals 5,000 ML for the Gilbert River catchment. It may be granted only if it is to be utilised for a State purpose.

The *Gulf general unallocated water reserve* totals 731,550 ML, including 467,000 ML for the Gilbert River catchment. This may be granted for any purpose, and represents a very substantial amount of water available to support potential development.

Key emerging sub-domain strengths and challenges for sustainable development

The *Water Act 2000* has a consistent purpose: sustainable management of Queensland's water resources and quarry materials, incorporating the principles of ESD.

The Water Plan for the Gulf region provides a stable allocation mechanism. It was developed on a strong science base and extensive stakeholder input. However, the original Plan was relatively weak in terms of Indigenous engagement, cultural values assessment, and the consideration of the future impacts of climate change, and these need to be addressed. More consideration is also needed of emerging science on the impacts of catchment water extraction on marine ecosystems.

Meanwhile, the Gilbert River catchment has long been identified as being suitable for irrigated agriculture. Soil and land assessments have identified some 28,564 ha of irrigable land along the Gilbert River inside the proposed irrigation area and further irrigable land exists downstream (Petheram et al. 2013).

Other advantages of the Gilbert catchment for irrigated agriculture include the steady/increased rainfall projected for the Gulf region as a consequence of climate change. There have also been historical research trials, coupled with current dryland and irrigated cropping activities, that demonstrate:

- cropping viability and suitability for a range of diverse crops;
- highly suitability of the irrigation area for the establishment of an organic precinct;
- opportunities for early cropping season to open market windows and obtain premium prices;
- opportunities to integrate cropping activities with, and add value to, the established beef cattle industry; and
- advantages from the close proximity to Asian export markets, and counter seasonality that exists with agricultural production in Asia (Petheram et al. 2013).

The availability of 467,000 ML within the Gilbert River catchment from the Gulf general unallocated water reserve, while potentially removing a barrier to irrigated agriculture, may also attract development pressures to the catchment that could negatively affect EPBC Act values and other environmental outcomes. At this stage, the extraction of such a large volume of water from the Gilbert River for irrigated agriculture or other developments has not been fully assessed, and thus potential conflicting issues associated with where and what type of developments might be acceptable, remain unresolved. Likely to be affected by significant water extraction are: biodiversity, Indigenous and non-Indigenous social and cultural values and the productivity of regional fisheries.

Priorities for sub-domain improvement

As with other sub-domains, to resolve the major conflicts between the limited capacity to clear vegetation in the Gilbert catchment, and the significant amounts of water available for agricultural development, a stronger bio-regional planning framework may need to be applied. Again, within this context, a cohesive development plan may need to be considered as a coordinated project under the guidance of the Queensland *State Development and Public Works Organisation Act*.

Further, if development is to occur, Aboriginal people should benefit, including through use of the Indigenous reserve water for their own projects, or for trading with agricultural developers. However, very little policy or capacity building work has been done to support Traditional Owners access or utilisation of the Indigenous water reserve.

The lack of practical policy work in this space means that Indigenous groups in the Gilbert River catchment have limited awareness of the rights and opportunities available through the Indigenous reserve. Even if awareness was high, there is limited policy and procedure detail about how agreement can be reached between Indigenous rights holders about use of the water and associated benefits.

8 The Fisheries Sub-Domain

Commercial fisheries are managed both by the Australian Government (with export requirements using national sustainability guidelines) and Queensland Government (with both input and output controls as part of a formal regulatory mechanisms).

The Australian Fishing Zone (AFZ) extends from 3 to 200 nautical miles from the Australian coastline and establishes Australia's sovereign rights to explore and manage coastal and marine resources. Management of the Zone, and commercial fishing within it, involves regulation of boat licensing, strict compliance and enforcement of species harvest limits, and ongoing monitoring of the condition of Australian fisheries (DAFF 2007, 2014).

The AFZ is established through the Commonwealth *Fisheries Management Act 1991 (Cth), covering* Commonwealth waters. Management of the AFZ relates only to the use or protection of Commonwealth fisheries. Key objectives of the Act are for the Minister and the Australian Fish Management Agency (AFMA) to:

(i) implement efficient and cost-effective fisheries management on behalf of the Commonwealth;

(ii) ensure that the exploitation of fisheries and related resources are carried out in accord with the principles of ecologically sustainable development (including exercise of the precautionary principle);

(iii) have regard for the impact of fishing activities on non-target species and the long-term sustainability of the marine environment;

(iv) maximise the net economic returns to the Australian community from the management of Australian fisheries;

(v) ensure accountability to the fishing industry, and to the Australian community, in AFMA's management of fisheries resources; and

(vi) achieve government targets in relation to the recovery of the costs of AFMA.

These objectives mean the Minister, AFMA and Joint Authorities give regard to the objectives of:

(i) ensuring AFZ resources are not endangered by over-exploitation;

(ii) achieving the optimum utilisation of the living resources of the AFZ;

(iii) ensuring that conservation and management measures in the AFZ implement Australia's obligations under international agreements that deal with fish stocks; and

(iv) ensuring that the interests of commercial, recreational and Indigenous fishers are taken into account.

Alternatively, within Queensland waters, the particular purposes of the Queensland *Fisheries Act 1994* (Qld) include:

(i) providing for the use, conservation and enhancement of the community's fisheries resources and fish habitats in a way that seeks to apply, balance and promote the principles of ecologically sustainable development; and

(ii) ensuring that fisheries resources are allocated in a way that maximises the potential economic, social and cultural benefits to the community.

The Queensland Sustainable Fisheries Strategy 2017-2027 outlines the Queensland government's reform agenda for fisheries management. The Strategy identifies 33 actions across ten major areas of reform including improved monitoring and research, setting sustainable catch limits through harvest strategies, improved stakeholder engagement, undertaking Ecological Risk Assessments (ERAs), reviewing fishing rules and access, implementing more responsive decision-making and strengthening compliance powers and resourcing (QDAF 2023).

The Queensland Ecological Risk Assessment Guideline was published in March 2018 and was developed as part of the Queensland Sustainable Fisheries Strategy 2017 – 2027 (QDAF 2018). It provides an overview of the strategy for developing Ecological Risk Assessments (ERAs) for Queensland's fisheries. All fisheries that interact with species listed under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999,* must be managed to address the risks of their interactions.

The *Fisheries Act 1994* (Qld) sets out Fisheries Queensland's responsibilities for the economically viable, socially acceptable and ecologically sustainable development of Queensland's fisheries resources, including for recreational fishing.

Recreational fishers are not required to hold a licence when fishing in Queensland, unless in specific 'stocked compounds', none of which exist in the Gilbert River catchment. However, bag limits and minimum fish sizes restrictions apply across the State, depending on the species. A Fisheries Regulated Waters declaration may also be made under the *Fisheries Declaration 2019*.

Operation of the sub-domain in the Gilbert

The Australian Fisheries Management Authority (AFMA) is responsible for the day-to-day management and compliance of Commonwealth fisheries. Offshore constitutional settlement

arrangements between the State/Territory and Commonwealth governments set out the division of powers between the Queensland and Australian Governments in managing coastal waters, including shipping, mineral exploration, fisheries, and crime at sea (DAFF 2014).

Meanwhile, the Department of Agriculture and Fisheries (DAF) operate the *Fisheries Act 1994* (Qld) between the Queensland coast and three nautical miles offshore. Under the Queensland legislation, fishery-specific management plans, generated for individual fisheries by the relevant State management agency, also guide local management and implementation. These management plans are reviewed every five years (DAFF 2014).

Based on these arrangements, two main fisheries are recognised in the Gulf of Carpentaria. The Northern Prawn Fishery and the Gulf of Carpentaria Fishery, both of which are managed under various Commonwealth and State arrangements. The Northern Prawn Fishery in the Gulf, with a total of 54 vessels licensed to catch prawns, was valued at $94.9 million in the 2010–11 financial year (Skirtun et al. 2012).

At the same time, with a total of 101 licence holders, the Gulf of Carpentaria Fishery was valued at approximately $22.5 million (Skirtun et al. 2012). This important fishery has three sub-fisheries: (i) the Gulf of Carpentaria Line Fishery (22 licences and a gross value of $1.5 million); (ii) the Gulf of Carpentaria Inshore Fin Fish Fishery (76 licences and a gross value of $17 million); and (iii) the Gulf of Carpentaria Developmental Fin Fish Trawl Fishery (3 licences and a gross value of $4 million; Barber et al. 2013).

Fisheries management is closely linked to coastal protection. The declared Staaten-Gilbert Fish Habitat Area covers estuarine reaches and marine waters either side of and between the two river mouths. Fish Habitat Areas (FHA) are specific areas protected from physical disturbance associated with coastal development and declared under Queensland's *Fisheries Act 1994*. They are part of Australia's Nationally Representative System of Marine Protected Areas and fit within the International Union for the Conservation of Nature and Natural Resources (IUCN) Protected Area Management Category VI (i.e., a Managed Resource Protected Area).

A 2012 report found the Staaten-Gilbert FHA to be a medium priority for action as it was a remote area with little development pressure. It was considered, however, that there are no ongoing partnerships with State and local governments to facilitate management and planning of the area, that there had been little integration of protection considerations into regional and local planning processes, and that there were no specific communication activities for the promotion of this FHA (DAFF 2012).

A second Fish Habitat Area assessment report found that that no additional development had been authorised in Southern Gulf FHAs, including the Staaten-Gilbert FHA. The report also found that FHAs were now better integrated into the state's planning and development system as declared FHAs have become Matters of State Environmental Significance under the State's 2013 Biodiversity SPP. This means that FHAs must now be appropriately considered in local planning schemes (DES 2017). The Shire of Carpentaria's current Planning Scheme was adopted in 2008, so may not be up to date with FHA considerations, although its Planning Strategy Map 1 shows the Staaten-Gilbert and other FHAs in the Shire.

The Queensland Gulf of Carpentaria Inshore Fin Fish Fishery (GOCIFFF) Status Report was prepared in June 2019 for reassessment and approval of the fishery under protected species and export provisions of the EPBC Act. The status report found that:

- the GOCIFFF continues to be managed in accordance with provisions outlined in the Queensland *Fisheries Act 1994,* and the Queensland *Fisheries Regulation 2008*;
- material changes to the GOCIFFF had been made to improve protection of hammerhead sharks and black jewfish;
- the Queensland Parliament passed the *Fisheries (Sustainable Fisheries Strategy) Amendment Bill 2018,* and released the Queensland Sustainable Fisheries Strategy 2017-2027;
- the QDAF was progressing the development and implementation of an independent data collection and validation program, such as systems for robotic vision and on-board electronic monitoring, and is due to report results and recommendations by the end of 2019; and
- QDAF provides online tools to assist fishers with identification of fish and shark species in Queensland waters, including protected and no take species.

A significant downstream section of the Gilbert River is declared as *Fisheries Regulated Waters – 264* under the *Fisheries Declaration 2019*. The fisheries regulated waters declaration applies restrictions to commercial and recreational fishing such as fishing times, species, and equipment.

Maintaining sustainable fisheries is achieved by a number of means including a strong focus on compliance. Queensland's compliance is implemented and enforced by Queensland Boating and Fisheries Patrol (QBFP), an organisational unit of Fisheries Queensland within the Department of Agriculture and Fisheries. (QDAF 2015). The nearest QBFP office to the Gilbert River catchment is located in Karumba.

Finally, all fisheries that interact with species listed under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* must be managed to address the risks of these interactions. Recently, this has resulted in the gillnet closures in the Gulf due to risks to sawfish and other listed species.

Key emerging sub-domain strengths and challenges for sustainable development

Key sub-domain strengths in the Gilbert catchment relevant to ESD outcomes include:

- Commonwealth and State fisheries legislation includes consistency with ESD principles;
- there has been a significant investment in plan and strategy development for Australian fisheries in the Gulf, focussed on sustainable use and management;
- nationally, there is a strong emphasis on the economic importance of fisheries, rather than their environmental significance;
- the management of Australian fisheries is generally collaborative, with a high degree of connectivity and alignment between the multiple stakeholder groups (DAFF 2014) and this is especially true in the northern prawn fisheries in the Gulf (Dale 2014), where

stakeholder engagement is critical in the development of strategies, implementation, and the ongoing monitoring of the condition of fisheries;

- management delivery capacity is generally high in Commonwealth and State agencies;
- there is a strong research capacity to support fisheries management in Australia and the Gulf, but that there can be poor connection between on-ground managers and research;
- the capacity of fisheries monitoring and research systems are quite mature; and
- in the Commonwealth context, scenario analysis tools provide decision-makers with greater information to support strategy development and priority setting.

Key sub-domain challenges relevant to ESD outcomes in the Gilbert catchment include that the management of Commonwealth Gulf of Carpentaria fisheries is potentially affected by Queensland Government decision-making in the Gilbert catchment, and subsequent potential changes in streamflow, fish passage, sediment and nutrient load and other factors.

There is still significant science needed to determine the impact of flow reductions and catchment and marine health. Maintaining flows in low- and medium-flow years is critical for sustaining estuarine productivity as these flows deliver essential nutrients that fuel primary productivity. This has flow-on effects to the whole food web which is reliant on the primary producers (i.e., algae). Additionally, first-flush flows at the start of the wet season are crucial for delivering nutrients which stimulate productivity, providing food for fisheries species, as well as other species such as migratory shorebirds. In low to medium flow years, reduction of flows from water extraction keeps salinities high, making prawns less likely to move from the estuaries into the offshore fishery.

Without appropriate water development planning, it is not clear what future development impacts might emerge. For example, water extraction following multiple years of low-to-medium flow could have very major impacts. Such a scenario is not unusual for rivers flowing into the Gulf, particularly for the Flinders which has the highest interannual variability in flow of the three rivers and can have multiple consecutive years of no to low flow. Both banana prawn and barramundi (and other species using the estuary) could be highly vulnerable to additional years of no or little flow.

Improved modelling suggests that reductions in flow will affect commercial prawn and barramundi catch, indicating the potential for significant infrastructure projects, such as dams, to have major impacts on these fisheries. Economic analysis has shown that substantial reductions in profits could result for commercial prawn and barramundi fisheries in the short-term. The potential adverse long-term cost implications to the fisheries are as-yet unquantified.

Additionally, the commercial fishery harvest reflects only one source of value delivered by water resources in these catchments; other economic values include tourism (especially recreational fishing) and Indigenous harvesting for fish and other species. Also, species and habitats are of environmental value. There is a risk that water-resource development could adversely impact all these values (Burford et al. 2021).

It may take some years to determine the impacts of water development on productivity in the estuaries, given the natural variability of the Gulf systems. Water allocation should occur on

a cautionary basis. A key remaining challenge is the linking the impacts of water development in the upper reaches of the rivers with impacts hundreds of kilometres downstream at the end of the catchment (Burford et al. 2021).

It is also worth noting that there are no current native title sea claims and only two determinations in Gulf of Carpentaria seas. The determinations are: Wellesley Islands Sea Claim in the southern gulf around Mornington Island; and, the Torres Strait Regional Seas Claim which covers gulf waters from the tip of Cape York south to the Skardon River.

Despite current limited native title claims and determinations, it can be anticipated that claims will increase significantly in coming years, and Aboriginal people will increasingly seek rights to fish commercially. Of precedence here is that in the *Akiba on behalf of the Torres Strait Regional Seas Claim Group versus Commonwealth of Australia and Ors* (High Court Case No. B58/2012), it was determined that the Commonwealth *Fisheries Act 1952* and the Queensland *Fisheries Act 1887*, which both required licensing of fishing activities, did not extinguish the relationship of the people to the land nor extinguish the native title bundle of rights. The case recognised that Torres Strait Islanders have traditionally exploited marine resources for commercial purposes, and that the relevant right was a right to take resources for any purpose, which includes a right to fish for sale and trade.

Despite the anticipated increase in native title claims and the commercial fishing rights that may be recognised as a result of these claims, and the aspirations of Aboriginal people to engage in commercial fishing regardless of native title rights, there has been limited investment by the Commonwealth or Queensland governments to support the emergence of an Indigenous commercial fishing industry. However, the Queensland Government has prepared a draft Aboriginal and Torres Strait Islander commercial fishing development policy.

In Queensland, the Sustainable Fisheries Strategy (2017–2027) has committed to developing a commercial fishing policy for Aboriginal peoples to support economic development for sustainable fishing, and this resulted in the *Aboriginal Commercial Fishing Development Policy* (2020) which provides that an amount of up to 10 tonnes may be set aside as an Indigenous commercial allocation for each fishery. Access to the Indigenous commercial allocation will be through a non-transferable fixed-term Indigenous fishing permit for a period of up to three years. Extensions may be considered on a case-by-case basis, but at this point, only two Indigenous fishing permits are currently active (Queensland Government 2020a).

Of final importance here is the fact that there is a strong reliance on regulatory instruments in this sub-domain, but more use of suasive and educational instruments is needed to ensure ongoing awareness and compliance to regulatory controls within the Gulf fisheries.

Priorities for sub-domain improvement

Management arrangements for commercial fisheries have evolved strongly over the past 30 years in Australia, and they are generally robust, however, this varies for different fisheries in the Gulf. There are currently high levels of involvement in system governance from multiple sectors, including industry, government, non-government organisations and the community. There is strong societal support for the ongoing management of ecologically and economically significant fisheries such as those in the Gulf. As such, governance

arrangements in this sub-domain are quite mature and functional, but there would be major adverse consequences if governance deteriorated.

Priorities for continuous improvement in the sub-domain could include:

- A stronger link between water and development planning, including further research on the link between water quality and quantity declines on fisheries productivity in the Gulf − this will require stronger linkage between Queensland development planning, assessment and approval processes applying to the Gilbert catchment, and processes for the management of Queensland and Commonwealth fisheries; and
- Continuous improvements in the quality of co-management activities and monitoring of individual fisheries, particularly including Traditional Owners.

9 The Terrestrial Biosecurity Sub-Domain

Weed and feral pests are a major, economic, environmental, and cultural risk for the Gilbert River catchment. These pests are primarily managed through the Queensland *Biosecurity Act 2014* (Qld), the main purpose of which is to:

- provide a framework for an effective biosecurity system for Queensland that helps to minimise biosecurity risks, and facilitates responses to impacts on a biosecurity consideration, including biosecurity events, in a timely and effective way;
- ensure the safety and quality of animal feed, fertilisers, and other agricultural inputs; and
- help align responses to biosecurity risks in the State with national and international obligations and requirements for accessing markets for animal and plant produce, including live animals and plants.

It is also a purpose of this Act to manage risks associated with emerging, endemic and exotic pests and diseases with potential to impact on plant and animal industries, the built environment, companion or leisure animals, biodiversity and the natural environment, tourism, lifestyle and pleasure industries, infrastructure and service industries (including power, communication, shipping and water supplies), the transfer of diseases between animals and humans, and the biological, chemical and physical contaminants in carriers.

The key purposes of the Act are to be achieved primarily by:

- imposing a general obligation on persons to prevent or minimise the impact of biosecurity risks on human health, social amenity, the economy, and the environment;
- regulating activities involving biosecurity matter or carriers;
- ensuring that full scientific certainty should not be used as a reason to postpone taking action to prevent a biosecurity event or to postpone a response to a biosecurity risk;
- providing for flexible and timely ways of minimising and mitigating biosecurity risks;

- providing for monitoring and enforcement of compliance with this Act;
- providing for codes of practice relating to a person's obligations under this Act;
- providing for the chief executive to make guidelines or policies on application of the Act; and
- providing for a framework that improves the capacity of local governments, industry, and the community generally to respond to biosecurity risks.
    -

The *Queensland Invasive Plants and Animals Strategy* (2019–2024) has been developed in the context of this legislation. The strategy complements other key biosecurity documents including:

- the *Intergovernmental Agreement on Biosecurity* (IGAB), which came into effect in 2012, plus the recommendations in the 2017 review endorsed by the Agriculture Ministers' Forum;
- national legislative obligations related to the EPBC Act;
- the *Australian Pest Animal Strategy* (2017–2027), which embodies eight principles that underpin effective pest animal management;
- the *Australian Weeds Strategy* (2017–2027), which provides seven principles of effective weed management; and
- the *Queensland Biosecurity Strategy* (2018–2023), with six strategic themes for management within the Queensland biosecurity network.

The Australian Pest Animal Strategy embodies eight principles that underpin effective pest animal management nationally, including prevention, shared responsibilities, coordination, priority asset protection, monitoring and best practice animal management.

The Australian Weeds Strategy promotes seven principles that underpin effective weed management, including shared responsibility, evidence-based decision-making, risk prevention, prioritisation, coordination, capability building and those creating risks taking responsibility.

Finally, the Queensland Biosecurity Strategy outlines six themes for biosecurity management. The strategy includes responses such as collaborative governance and leadership, support for every Queenslander to play their part, innovation, investment leverage and the development of intelligence systems (Biosecurity Queensland 2019).

Commonwealth investment

The Australian Government is investing $1 billion over 4 years from 2023–24 and an ongoing $268.1 million per year to strengthen the national biosecurity system through the development of a long-term sustainable funding model. This includes support for continuation of the Indigenous Ranger Biosecurity Program which plays a critical role in

northern Australia's biosecurity, enabling the rangers to continue animal, plant and aquatic monitoring and detection activities to protect our domestic industries and our overseas agricultural export status (DITRDCA 2023).

Operation of the sub-domain in the Gilbert

The Northwest Queensland Regional Biosecurity Plan was developed by the Northwest Queensland Regional Organisation of Councils (NWQROC) in partnership with Southern Gulf NRM, to establish a catchment approach to the management of invasive biosecurity matters. The plan includes and has been adopted by the Etheridge and Carpentaria LGAs and is relevant to all of the Gilbert River catchment (Southern Gulf NRM 2022).

Gulf Savannah NRM's *2023 – 2033 Natural Resource Management Plan* for the Northern Gulf Region identifies feral animals and pests, and invasive weeds, as moderate pressures on environmental values which are declining. Under a business-as-usual future scenario, these pressures are predicted to become very high, and biosecurity is, therefore, a high priority in the plan (Gulf Savannah NRM 2023).

Key emerging sub-domain strengths and challenges for sustainable development

While there is a strong policy and legislative foundation for biosecurity within the catchment, there remain significant pest animal and weed issues affecting biodiversity and cultural values. There are particularly limited support arrangements for coordinated and integrated pest management.

Priorities for sub-domain Improvement

Priorities for sub-domain improvement include the need for longer-term, stable and integrated weed and feral animal management programs to protect ecological and economic values in the Gilbert catchment.

10 The Regional NRM and Landcare Sub-Domain

In November 2000 the Council of Australian Governments (COAG) agreed to a regional model for the delivery of the National Action Plan for Salinity and Water Quality (NAP). Following this, the Natural Resource Management (NRM) Ministerial Council adopted a regional delivery model for Natural Heritage Trust (NHT) funding of environmental activities at a regional level, leading to the integrated implementation of both programs based on regional needs. The principal driver underpinning the regional delivery model for NRM has generally been to 'harness the capacity of those closest to the problem on the ground', building on local knowledge, experience and expertise and enabling flexible and responsive solutions to local NRM challenges (ECITARC 2006).

The key features of Australia's and Queensland's regional NRM delivery model include:

- the development of a framework that sets out the respective NRM roles for Commonwealth, state/territory and local governments and the community;
- a shift from funding of individual projects to funding outcomes determined through regional NRM strategic planning;
- the devolution of decision-making to a regional level to allow more flexible decision-making tailored to local conditions and needs;
- the introduction of national standards and targets to guide and provide direction for investment in NRM;
- a comprehensive accreditation, monitoring and evaluation framework to achieve consistent and acceptable standards of program delivery; and
- encouragement of community capacity building through involvement in local NRM.

In Queensland, there are 15 NRM regions and 14 regional NRM bodies. The regional bodies were established in 2003, and each body is responsible for developing and implementing a regional NRM plan. There is no legislative basis for the support of regional bodies in Queensland. They are, in the main, incorporated entities and not catchment management authorities. The key role of regional NRM bodies involves undertaking regional natural resource management planning, prioritising regional-level investments, coordinating actions at the landscape scale, getting community ownership in decision-making and reporting on progress. Their role includes:

- mobilising community involvement and contributions to achieving positive NRM outcomes at a regional level;
- undertaking comprehensive consultation with the broad community and segments of the community with interests in natural resource management;
- developing integrated NRM plans that would form the basis for strategic investment by governments, the community, and other stakeholders in action to improve management of natural resources and the environment;
- developing management, resource condition and aspirational targets as agreed by governments and communities in partnership as part of building the integrated NRM plans;
- developing investment strategies as a basis for undertaking targeted investment by governments and community to provide on-ground NRM improvements;
- facilitating the delivery of education and information to the broad community and segments of the community with interests in natural resource management;
- providing advice on priorities for investment of grants and other related funding;
- monitoring and evaluating progress and reporting against targets at the regional scale;

- ensuring effective governance arrangements are in place in both establishing priority-setting processes and in accounting and administering government and community funds; and
- representing regional community NRM interests to governments (ECITARC 2006).

Government investment for the regions is based on regional plans and targeted programs as well as being allocated on the basis of individual project applications. The regional plans identify regional priorities and set up a framework for investment in action. Regional NRM bodies develop their plans with feedback and advice from all levels of government and specialist advisory bodies. All key stakeholders are included in the planning process through consultation and negotiation. Stakeholder groups include communities, Indigenous people, academic/scientific communities, environmental groups, industry, local governments and state/territory and Commonwealth agencies. The plans are jointly agreed to by government and the community, along with investment strategies for implementation. They outline the goals, timelines, roles, and responsibilities of relevant parties. The regional NRM planning process takes account of the environmental, economic, and social dimensions of any natural resource issues and should be based on sound science (ECITARC 2006).

Within the wider regional NRM context, the National Landcare Program (NLP) is a key partner in regional natural resource management activities. The NLP, focussed on supporting regional and Landcare groups, contributes to addressing problems such as vegetation loss, soil degradation, introduced pest weeds and animals, water quality changes, and flows and fire regime changes. The NLP's Regional Land Partnerships Program has been investing $450 million nationally over 5 years from July 2018 to June 2023, delivering national priorities at a regional and local level. As the largest component of the NLP, this investment is being delivered via a revised regional model that supports a range of projects contributing to four environment and two sustainable agriculture outcomes.

Regional NRM investment also connects with efforts for the recovery of species identified under the National Threatened Species Strategy, protecting threatened ecological communities, and reducing threats to our globally important wetlands and world heritage sites. Regionally funded projects are also improving on-farm soil, biodiversity, and vegetation, and increasing the capacity of our farms to adapt to climate change and evolving market demands (DCCEEW 2022).

Commonwealth investment

In late 2022, the Australian Government provided $1.1 billion for the next phase of the Natural Heritage Trust to deliver sustainable agriculture and environmental outcomes, as well as the next phase of the Indigenous Protected Areas program. In the Regional Ministerial Budget Statement for 2023/24, it then allocated $439.2 million of Trust funding to DCCEEW over 5 years to maintain capability of regional partners, deliver benefits to Australia's threatened species, support climate-smart agriculture, and protect internationally listed World Heritage properties and Ramsar wetlands.

The Australian Government is committed to developing a climate-smart and sustainable agriculture sector and is investing $302.1 million over 5 years from 2023–24, through the Natural Heritage Trust to strengthen sustainable farming and natural resource management

practices that reduce the agriculture sector's emissions and build climate resilience, enhances market access, and supports improved environmental outcomes. The investment includes:

- $76.4 million to support national and regional natural resources management delivery partners, including peak land care organisations, and a network of Sustainable Agriculture Facilitators to ensure actions can be delivered efficiently and at scale, and to provide extension services to accelerate the adoption of climate-smart agriculture practices; and
- $158.6 million to drive impactful on-ground projects, to strengthen agricultural sustainability and productivity, accelerate emissions reduction and preserve on-farm natural capital – this includes landscape-scale regional priority projects and projects to support the agriculture sector to transition to a low emissions future and foster sustainable agriculture (DITRDCA 2023).

Operation of the sub-domain in the Gilbert

Gulf Savannah NRM (previously Northern Gulf NRM) is the regional natural resource management body for the Gilbert River, Mitchell, Staaten, and Norman River catchments.

The *Northern Gulf NRM 2017* regional NRM plan, which expired in 2022, is now replaced by the *Gulf Savannah NRM 2023*, covering the period from 2023 – 2033. Gulf Savannah Regional NRM Body, in partnership with the National Landcare Program, are currently implementing two significant projects: (i) the Healthy Farming Futures for the Northern Gulf Project; and (ii) the Biodiversity Bright Spots in the Northern Gulf for the Golden Shouldered Parrot Project (DCCEEW 2022).

Key emerging sub-domain strengths and challenges for sustainable development

Key strengths and challenges facing this sub-domain include:

- regional NRM planning has delivered some significant benefits, resulting in the development and coordinated implementation of ongoing but increasingly limited funding support;
- NRM arrangements in Queensland are currently only somewhat integrated and aligned with local and national scales of planning and management;
- early progress in the region is showing reasonable movement towards improved land management, so sub-domain failure would have wide consequences for the region;
- NRM planning and delivery arrangements are relatively mature though currently weakening due to declining State and Federal cooperation and commitment (Dale et al. 2013); and
- recent government policy shifts have led to a lack of mandate for regional NRM planning, limiting funding certainty and increasing competition between regional groups.

Priorities for sub-domain improvement

- Priorities for improvement in this sub-domain include:
- the development of a revised framework (bi- or tri-lateral) for inter-government agreement that is mindful of distributional equity between regions;
- the need to ensure investment design is linked to long-term resource condition monitoring;
- the need to enhance place-based (especially regional) approaches to knowledge brokerage and research delivery; and
- the need to support performance benchmarking and continuous improvement in regional NRMs and potential expansion to other sub-domain partners.

11 The Ecosystem Service Market Sub-Domain

Ecosystem services are the benefits provided to humans through the transformations of resources (or environmental assets, including land, water, vegetation and atmosphere) into a flow of essential goods and services such as clean air, water, and food (Constanza et al. 1997, DEWHA 2009).

Maintenance and restoration of natural ecosystems and the services they provide is therefore essential to sustained community wellbeing, economic prosperity and efficiency.

Biodiversity is fundamental to the provision of ecosystem services as the diversity of organisms is a direct source of resources, such as food and fibre, and the underpinning of clean water and air through the role of these organisms in energy and material cycles. Loss or changes in biodiversity directly influence the capacity of ecosystems to produce and supply essential services, and can affect the long-term ability of ecological, economic and social systems to adapt and respond to global pressures (DEWHA 2009).

In 2005, the Millennium Ecosystem Assessment identified and categorised ecosystems and their resulting services, identified the links between these services and human societies, and the direct and indirect drivers and feedback loops. The Millennium Ecosystem Assessment framework identified ecosystem services within four categories:

- provisioning services, such as food and water
- regulating services, such as flood and disease control
- supporting services, such as nutrient cycling, that maintain the conditions for life; and
- cultural services, such as spiritual, recreational, and cultural benefits (DEWHA, 2009).

To restore and protect ecosystem services on a large scale, various environmental market-based approaches and frameworks are being established, mainly by the Australian Government, to incentivise private capital and landholder investment.

Some environmental market schemes are administered by government bodies, in particular the Clean Energy Regulator (CER) which administers schemes legislated by the Australian Government for measuring, managing, reducing or offsetting Australia's carbon emissions. The CER has administrative responsibilities for the:

- National Greenhouse and Energy Reporting Scheme under the *National Greenhouse and Energy Reporting Act 2007*;
- Emissions Reduction Fund under the *Carbon Credits (Carbon Farming Initiative) Act 2011*;
- Renewable Energy Target under the *Renewable Energy (Electricity) Act 2000*; and
- Australian National Registry of Emissions Units under the *Australian National Registry of Emissions Units Act 2011*.

The Agriculture Biodiversity Stewardship Package, administered by the Department of Climate Change, Energy, the Environment and Water, is looking at how to use environmental markets to increase private sector participation in delivering biodiversity outcomes. It builds on programs including the Carbon + Biodiversity (C+B) Pilot and Enhancing Remnant Vegetation Pilot.

The C+B Pilot is trialling how a market arrangement for landholders could create new income from plantings that deliver biodiversity improvements and carbon abatement. Landholders participating in the C+B Pilot are delivering long-term biodiversity improvement through planting native trees and shrubs in conjunction with an Emissions Reduction Fund (ERF) registered environmental planting.

The Enhancing Remnant Vegetation Pilot is trialling ways to pay landholders for improving biodiversity on their properties. This pilot aims to help develop a biodiversity market that encourages environmental improvement on private land. The pilot looks at managing native vegetation using locally adapted management protocols, developed by the Australian National University in consultation with NRM organisations. Successful landholders receive payments to manage and improve existing remnant native vegetation on their property (DCCEEW 2023).

Other ecosystem services market schemes are administered by not-for-profit organisations such as Eco-Markets Australia which administers the Reef Credit Scheme. The objectives of the Reef Credit Scheme are to: (i) improve water quality entering the Great Barrier Reef; (ii) contribute to the delivery of water quality improvement targets set under the Reef 2050 Water Quality Improvement Plan (2018), and any subsequent revisions to the water quality targets; and (iii) create a market mechanism to incentivise projects that achieve water quality improvements (DCCEEW 2023a).

In response to the 2021 State of the Environment Report the Australian Government committed to delivering better environmental protection and reforms under the Nature Positive Plan. One of these reforms is the creation of a Nature Repair Market, to encourage voluntary investment (DCCEEW 2023b).

Demand for the market could come from several sources, including:

- carbon market participants seeking projects which also benefit nature; and
- philanthropic and Environmental, Social and Corporate Governance (ESG) motivated investment, driven by reporting and disclosure requirements, such as the Taskforce for Nature Related Financial Disclosures.

The *Nature Repair Market Bill* proposes to establish a transparent framework to enable the Clean Energy Regulator to issue Australian landholders with tradeable biodiversity certificates for projects that protect, manage and restore nature. The proposed market is designed to operate in parallel with carbon markets, so landholders can obtain certification for carbon projects that effectively increase biodiversity. These certificates can then be sold to businesses, organisations, governments, and individuals (DCCEEW 2023b).

All landholders, including First Nations peoples, conservation groups and farmers, can participate in the proposed market. Landholders can undertake projects to improve or protect existing habitat, and establish or restore habitat. Projects can be on land, inland waterways (lakes and rivers), or in marine and coastal environments.

On **March 30, 2023**, the Senate referred the provisions of the Nature Repair Market Bill 2023 and the Nature Repair Market (Consequential Amendments) Bill 2023 to the Environment and Communications Legislation Committee for inquiry and report by 1 August 2023; following an authorised extension, the report is now due **April 18, 2024.**

Operation of the sub-domain in the Gilbert

Of the few ecosystem service markets that currently exist, only the Australian Carbon Credit Units Scheme (ACCU Scheme; formerly known as the Emissions Reduction Fund) is a realistic option for the Gilbert River catchment.

Of the other ecosystem service markets, the C+B Pilot and Enhancing Remnant Vegetation Pilot apply only in limited areas that do not include the Gilbert. The Reef Credit Scheme only applies to catchments that drain to the Great Barrier Reef, and the tradeable biodiversity certificates proposed by Nature Repair Market Bill, are yet to pass into legislation.

The ACCU Scheme offers landholders, communities and businesses the opportunity to run projects in Australia that avoid the release of greenhouse gas emissions or remove and sequester carbon from the atmosphere. Two projects are registered for the Gilbert River catchment include the Mount Little Station Riparian Corridor Regeneration Project, and the Northwest Queensland Conservation Initiative Site #1.

Both projects establish permanent native forests through assisted regeneration from in-situ seed sources (including rootstock and lignotubers) on land that was cleared of vegetation and where regrowth was suppressed for at least 10 years prior to the project having commenced. The Jervoise Station Carbon Project is also marginally within the Gilbert River catchment, and some projects that apply Australia wide, or across States, may also apply to the Gilbert River catchment.

There are no savannah burning projects in the Gilbert River catchment.

Key emerging sub-domain strengths and challenges for sustainable development

The ecosystem service market demonstrates limited current activity in the Gilbert River catchment. Projects that avoid the release of greenhouse gas emissions or remove and sequester carbon are currently the most readily applicable, but there has been limited establishment of such projects. The other ecosystem service market options that apply to the Gilbert River catchment significantly limit the extent of ecosystem service projects and are also limited in uptake. The tradeable biodiversity certificates proposed by *Nature Repair Market Bill* hold some potential for application in the Gilbert River catchment, but if and when these certificates will be available is unknown.

Priorities for sub-domain improvement

The environmental values of the Gilbert River catchment are largely intact because of the limited land clearing and development in the catchment. The ecosystem service market should provide options for maintaining these environmental values. Additional ecosystem service market options that stimulate investment in the maintenance and restoration of natural ecosystems and their biodiversity are necessary for an active market in the Gilbert River catchment. Current options have limited applicability and uptake, so additional effort is required to encourage landholders to make use of these options, and to create new options that provide for the economically viable use of land through ecosystem services provision.

The Economic Development Domain

1 The Northern Development Sub-Domain

The 2015 *Our North, Our Future: White Paper on Developing Northern Australia (White Paper)* is the Government's 20-year framework intended to guide policy makers and investors in building a strong, prosperous, resilient northern economy (Commonwealth of Australia 2015). It sets the broad policy framework for the northern development sub-domain and mobilises investment and collaborative support with potential to unlock the strategic potential of the north. It is focused on developing industries and facilitating long-term economic growth.

The Government has committed to 'refresh' the White Paper and to develop an action plan for Northern Australia development. The action plan will align with Government priorities and policies, including the Government's new Regional Investment Framework and will be developed during 2023–24 (DITRDCA 2023).

While not directly embedded within the White Paper framework, also of importance is the Regional Development Australia (RDA) network; a national network of 52 Committees made up of local leaders who work with all levels of government, business, and community groups to support the economic development of their regions. RDAs support regional development projects in Northern Australia and encourage policies that strengthen human capital, improve productivity, invest in infrastructure, increase access to markets, build our regional comparative advantage and business competitiveness, increase economic activity, and create new jobs and social prosperity.

Operation of the sub-domain in the Gilbert

Outcomes of the White Paper that are of relevance to the Gilbert include the establishment of the following key management structures to implement northern development policy objectives.

- the Office of Northern Australia (ONA), which is the Australian government's body invested in northern Australia expertise and provides oversight of its northern Australia policy agenda. It provides policy advice, coordinates operational support for the Northern Australia Infrastructure Facility, supports Indigenous inclusion and First Nations involvement in the agenda, coordinates whole-of-government reporting, and facilitates government effort;
- the Cooperative Research Centre for Developing Northern Australia (CRCNA), which is investing $75 million of Commonwealth funds, over ten years, to support industry-led co-funded research collaborations, disseminate research outcomes and ensure decision-makers have a strong evidence base to plan future investment for northern Australia;
- the Northern Australia Infrastructure Facility (NAIF) as a development financier to infrastructure projects in the Northern Territory, Queensland, and Western Australia. NAIF's mission is to be an innovative finance partner in northern Australia's developments and growth. Prescribed foci of investment are public benefit, economic and population growth, and Indigenous involvement. As an example, the Kidston Pumped Storage Hydro Project in the upper Gilbert is NAIF's largest investment to date, through a loan of up to $610 million. This project is forecast to create more than 500 construction jobs and deliver affordable, reliable electricity for north Queensland (NAIF 2023).

Regional Development Australia Tropical North (RDATN) covers the Gilbert catchment and is actively progressing sustainable agricultural development within the region. RDATN and Etheridge Shire Council (ESC) have developed the *Etheridge Shire Agricultural and Irrigation Precinct: Gilbert River Project Implementation Proposal*, by undertaking planning and consultation over many years into: ways to enhance the value of agricultural production in the Shire for the benefit of the residents, the region, and the nation through the sustainable capture and utilisation of the water resource; and, identifying a process of regulatory preapproval across the region (RDA TNQ 2022).

Key emerging sub-domain strengths and challenges for sustainable development

Some of the key issues concerning strengths and weaknesses of this sub-domain relative to ESD outcomes in the Gilbert include the following factors:

- the policy vision in this sub-domain is to leverage northern Australia's resources, and talented people to develop a strong and prosperous region, that substantially contributes to Australia's overall economic growth and national prosperity;
- the northern Australian vision includes creating vibrant and diverse economies, attracting investment, improving infrastructure, reducing red tape, and fostering innovation and leadership. It is understood via the policy that development should be

done in partnership with Indigenous Australians, ensuring opportunities for education, job creation, and economic development. The vision also emphasises the importance of protecting the unique natural environment of the north, for future generations (Commonwealth of Australia, 2015);

- the development strategy for Northern Australia is managed through various organisations and partnerships. These organisations work together to implement policies, programs, and initiatives that support economic growth, infrastructure development, and capacity-building in Northern Australia (Commonwealth of Australia 2015);
- CSIRO, and Northern RDA Alliance are also engaged in various aspects of research related to the development in the north (Commonwealth of Australia 2015);
- northern development is undermined by much higher business and household living costs compared to the rest of Australia and many other developed economies. These high costs discourage both investment, and further settlement of people within the region; and
- strong aspirations for development of the north are restricted by significant deficiencies in approaches to regional planning in the Gilbert, and the limited capacity of key stakeholders such as local government, industry, and local First Nations institutions.

Priorities for sub-domain improvement

Reform priorities in this sub-domain need to consider a better framework for regional-scale land use planning, based on an evidence-based model of appropriate development. Beyond such planning, a more cohesive pipeline of support for sustainable development investment is required, starting with ongoing research and development, partnership and supply chain building, feasibility investment, and the establishment of a wider range of brokered investment sources.

To support sustainable economic growth, the unique workforce needs of the Gilbert region must also be addressed. This includes the development of local workforce skills, attraction of skilled workers, and facilitated participation of Indigenous Australians (Infrastructure Australia 2021).

Importantly, the development of northern Australia should be progressed in full equity-based partnership with Indigenous Australians, with a focus on creating opportunities through education, job creation, and economic development. Ensuring Indigenous participation and benefiting Indigenous communities is an important priority for reform.

2 The State Development Sub-Domain

Major development projects have potential to significantly impact environmental and cultural values in the Gilbert catchment. The Queensland *State Development and Public Works Organisation Act 1971* (Qld) (SDPWOA) drives the broad State-based perspectives and roles with respect to development of State significance. The Act provides for State planning and development through a coordinated system of public works organisation, and for environmental assessment coordination, and for related purposes. It should be stressed that it

is unsuitable for smaller projects due to the cost of an application and the cost of required assessments. It should also be noted that a coordinated project under this Act is one of the very few ways that clearing of natural vegetation under the VM Act (Sub-domain 2) can be permitted.

Under section 26(1) of the Act, a proponent of a significant development project with one or more of the following characteristics may apply to have it declared a 'coordinated project' if it has:

- complex approval requirements, involving local, state, and federal governments;
- significant environmental effects;
- strategic significance to the locality, region, or state, including for the infrastructure, economic and social benefits, capital investment or employment opportunities; and
- significant infrastructure requirements.

Under the Act, in making key decisions, the Coordinator-General chooses the weight attributed to each of the above factors. The Coordinator-General is not bound to declare a project a coordinated project merely because it satisfies one or more of these characteristics. In making the declaration decision, the Coordinator-General must consider:

- detailed information about the project given by the proponent in an initial advice statement;
- relevant planning schemes or policy frameworks of a local government, the State, or the Commonwealth;
- relevant State policies and government priorities;
- a pre-feasibility assessment of the project, including how it satisfies an identified need or demand;
- the capacity of the proponent to undertake and complete the environmental impact statement (EIS) or impact assessment report (IAR) for the project; and
- any other relevant matter.

The proponent of a coordinated project must prepare an environmental impact statement (EIS) or impact assessment report (IAR) and may also be required to undertake a social impact assessment (SIA). The EPBC Act Bilateral Agreement between the Commonwealth of Australia and the State of Queensland relating to environmental assessment allows the Commonwealth Minister for the Environment to rely on specified State of Queensland environmental impact assessment processes in assessing actions under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This includes 'controlled actions' requiring assessment under Part 8 of the *EPBC Act*, which are undergoing an EIS assessment process under Part 4 of the *SDPWOA*.

Operation of the sub-domain in the Gilbert

Currently, there is only one coordinated project of State significance within the catchment. This is the 250-megawatt Kidston Pumped Storage Hydro Project in the Gilbert River catchment which attracted the impact assessment report (IAR) process under the Act.

It is possible that future water infrastructure projects or major agricultural projects envisaged for the Gilbert River catchment will attract coordinated project status.

Key emerging sub-domain strengths and challenges for sustainable development

Some of the strengths and challenges for this sub-domain include:

- there can be disharmony between major project assessments by the Australian and Queensland Governments, if seeking different outcomes at the local scale; these have potential for resolution through bilateral approvals negotiations (Dale et al 2016);
- social impacts of developments are under-assessed in project development and assessment (Dale et al. 2002);
- an understanding of impacts is generally based on incomplete knowledge of environmental values and without contextual links to wider pressures or trends (Dale et al. 2016);
- the limited governing capacity of the different sectors that need to be actively involved in the major development assessment process, can often be weak at implementation scales (e.g. rural sector, environment sector, First Nation institutions, etc.);
- that regular staffing turnover can cause capacity problems with alignment of Australian and Queensland Government visions for project assessment (Dale et al. 2016);
- both Queensland and Australian government project assessment requirements are relatively clear, though negotiation frameworks for offsetting require greater clarity and consistency;
- major project monitoring and compliance systems are quite weak, and are often not well engaged with affected communities (DEHP 2013; Grech et al. 2013); and
- there is a very limited research and development framework or shared strategy development for continuous improvement in this sub-domain (Zafrin and Rosier 2011).

Priorities for sub-domain improvement

The *SDPWOA* is potentially a very useful device that could be used to resolve the significant conflict between agricultural development, and environmental and cultural values in the region. As individual developments may be too small to trigger the Act, there is a limited capacity among individual proponents to resolve national-scale policy conflicts. Given its broad scope, its ability to permit otherwise prohibited clearing, and its links to the *EPBC Act* via the assessment bilateral, the *SDPWOA* may be a suitable vehicle for developing a modified a precinct-wide approach that could include a multitude of small projects, such as

outlined in the RDA's Etheridge Shire Agricultural and Irrigation Precinct: Gilbert River Project Implementation Proposal, could be used to trigger a coordinated project under the Coordinator-General's discretion, based on the significance of relevant factors.

For the Act to work effectively, however, the capacity of core regional stakeholders to fairly engage in major project assessment processes, needs strengthening.

3 The Regional and Local Land Use Planning Sub-Domain

The Queensland *Planning Act 2016* drives policy and decision-making associated with regional and local land use planning in Queensland. The purpose of this Act is to facilitate ecological sustainability through establishment of an efficient, effective, transparent, integrated, coordinated, and accountable system of land use planning (planning), development assessment, and related matters. This includes:

- state planning policies (including temporary ones) setting out planning and development assessment policies about matters of State interest;
- regional plans outlining integrated planning and development assessment policies regarding matters of State interest for particular regions of the State;
- planning schemes setting out integrated State, regional and local planning, and development assessment policies for all of a local government area;
- temporary local planning instruments (TLPIs) determining planning and development assessment policies to protect all or part of a local government area from adverse impacts in urgent or emergent circumstances;
- planning scheme policies outlining policies, for all or part of a local government area; and
- a development assessment system for implementing planning instruments and other policies and requirements about development by categorising development; categorising types of assessment for particular development; stating the processes for making, receiving, assessing, and deciding development applications; and, establishing rights and responsibilities in relation to development approvals.

The Queensland *Planning Act 2016* also provides arrangements to expeditiously identify and authorise development of key infrastructure across the State. This includes planning, development assessment, charging and other arrangements for infrastructure, to promote integrated land use and infrastructure planning and the cost-effective provision of infrastructure to service development. Other issues dealt with by the Act include provisions for a variety of offences and enforcement arrangements, as well as dispute resolution. Ministerial powers are provided to protect, or give effect to, the State's interests relating to planning and development assessment.

Decision-making processes for ethical development under the Act need to:

(i) take account of short and long-term environmental effects of development at local, regional, State and wider levels;

(ii) apply the precautionary principle;

(iii) seek to provide for equity between present and future generations;

(iv) provide opportunities for the community to be involved in making decisions;

(v) promote the sustainable use of renewable and non-renewable natural resources, including biological, energy, extractive, land and water resources that contribute to economic development;

(vi) value, protect and promote Aboriginal and Torres Strait Islander knowledge, culture and tradition;

(vii) conserve places of cultural heritage significance;

(viii) provide for housing choice, diversity and affordability;

(ix) encourage investment, economic resilience and economic diversity;

(x) supply infrastructure in a coordinated, efficient and orderly way;

(xi) apply amenity, conservation, energy use, health and safety in the built environment in ways that are cost-effective and of public benefit; and

(xii) avoid or minimise the adverse environmental effects of development (e.g. climate change, urban congestion, or declining human health).

Under the Act, State Planning Policies (SPPs) provide a consolidated and comprehensive view of the state's interests in land use planning and development. SPPs set out the matters that must be addressed in local government planning schemes and regional plans. The Queensland government is also now developing a suite of 'new generation' regional plans. The role of these regional plans is to identify and interpret the state's interests in land use planning and development for a particular region, as identified in the SPP. Regional plans define regional outcomes and identify regional policies to achieve these outcomes. The purpose of the outcomes and policies is to guide land use planning and development decisions in a region. They are prepared in collaboration with the wider community, local government, and key industry groups (QDAF 2023).

SPPs and regional plans perform complementary roles. Regional plans provide the basis for prioritising, qualifying, or resolving the SPP state interests in a particular region as necessary. A regional plan provides the specific strategic direction and policies to manage identified competing state interests for a region (QDAF 2023).

Also of importance to this sub-domain is Queensland's *Regional Planning Interests Act 2014* (Qld). This Act manages the impact of resource and other regulated activities on areas of the State that contribute, or are likely to contribute, to Queensland's economic, social, and environmental prosperity. The purposes of this Act are to:

- identify areas of Queensland that are of regional interest because they contribute, or are likely to contribute, to Queensland's economic, social, and environmental prosperity;

- give effect to the policies about matters of State interest stated in regional plans;
- manage the impact of resource activities and other regulated activities on areas of regional interest; and
- enable the coexistence, in areas of regional interest, of resource activities and other regulated activities, with other activities, including, for example, highly productive agriculture.

To achieve its purposes, this Act provides for a transparent and accountable process for the impact of proposed resource activities, and regulated activities on areas of regional interest, to be assessed and managed. In the context of biodiversity-related decision-making with Queensland's regions, there is a strong interplay between the operation of the *EPBC Act*, the Queensland *Vegetation Management Act*, and Queensland's regional and local land use planning system.

The State's regional biodiversity network mapping shows areas of ecological value that are to be maintained under State planning and where incremental habitat loss, fragmentation and degradation should be avoided. These maps are a resource that has been incorporated within some State-based regional planning considerations. While relevant to the operation of the *EPBC Act*, they are intended to be used by local governments when they undertake town planning scheme reviews, and when mapping of Matters of Local Environmental Significance (MLES). This mapping can also assist with developing appropriate management and investment in environmental rehabilitation and restoration activities.

Regional biodiversity network maps are comprised of several mapping layers which represent select environmental values across the landscape. A key feature of these maps is the inclusion of biodiversity values, which are identified through the state's Biodiversity Planning Assessments (BPAs) and Aquatic Conservation Assessments (ACAs). The State's regional biodiversity values mapping layer is based on the assessment of:

- large tracts of vegetation;
- intact terrestrial and aquatic connectivity;
- areas of high species richness and diversity;
- unique ecosystems and representativeness; and
- climate adaptation zones and refugia.

Regional biodiversity corridors, which are also identified through BPAs, are displayed on the regional biodiversity network map. These aim to:

- identify and protect terrestrial and aquatic ecological and evolutionary processes at a landscape scale;
- maximise connectivity between large tracts of remnant vegetation; and
- identify key areas for rehabilitation and offsets.

Matters of State Environmental Significance (MSES) are a component of the state's interest in biodiversity that is defined under the State Planning Policy (SPP) and the Environmental Offsets Regulation 2014 (Offset Regulation). MSES includes certain environmental values that are protected under Queensland legislation including the:

- *Nature Conservation Act 1992* (Qld)*;*
- *Marine Parks Act 2004* (Qld)*;*
- *Fisheries Act 1994* (Qld)*;*
- *Environmental Protection Act 1994* (Qld)*;*
- *Regional Interests Planning Act 2014* (Qld)*;*
- *Vegetation Management Act 1999* (Qld)*;* and
- *Environmental Offsets Act 2014* (Qld).

MSES mapping defines MSES under the relevant Queensland State Planning Policy and Offset Regulation. The mapping generates more than 17 individual layers using information from data including, but not limited to, regulated vegetation mapping, wetland mapping, protected areas, marine parks, fish habitat areas and legally secured offsets in the 'offsets register'.

Operation of the sub-domain in the Gilbert

A non-statutory *Gulf Regional Development Plan* (GRDP) was prepared by the Gulf Regional Planning Advisory Committee in 2000, and its area includes the Gilbert River catchment. The GRDP is a joint Government and community initiative to develop a comprehensive Regional Plan to encourage and guide sustainable growth and development of the Gulf region for 20 years.

The GRDP aims to provide a broad-level planning framework within which future decisions can be made with greater confidence, certainty, and community support. It also aims to ensure that growth and development can be managed in a manner that is consistent with the economic, environmental, and social values of the Gulf region. (GRPAC 2000). Although the relevant time period for the Gulf Regional Development Plan has passed, this regional plan is not currently being updated, but it is on the regional planning forward program.

At the local scale, the Etheridge Shire Council local government area closely aligns with the boundary of the upper Gilbert River catchment, down to the junction of the Gilbert and Einasleigh Rivers. The Gilbert River catchment downstream of this junction is within the Carpentaria Shire Council area. Between them, the planning schemes for these two local governments set out the integrated State, regional and local planning and development assessment policies for the Gilbert River catchment. Councils are members of the Northwest Queensland Regional Organisation of Councils (NWQROC).

Local planning schemes are the primary drivers for ensuring state, regional and local planning objectives are coordinated, integrated, and ultimately achieved. As such, local governments are key stakeholders, and local planning schemes are key tools, for achieving

sustainable regional development. They establish a strategic framework for managing regional and local growth and change. Within a regional context, they regulate local development by stipulating the rules (e.g., assessment categories, assessment codes and benchmarks), establishing zones designating land use (e.g., residential, industrial, and rural), and identifying overlays requiring further planning considerations (e.g., exposure and proximity factors; Dale et al. 2022).

Key emerging sub-domain strengths and challenges for sustainable development

Opportunities and challenges facing the sub-domain focus on the limited capacity of State and local governments to undertake strongly engaged and science-based planning. This risks the possibility that intensive agricultural activity and development, such as irrigated agriculture, will have impacts on biodiversity and cultural and social impacts of major significance to the region.

Priorities for sub-domain improvement

Given development tensions in the region, the priority for improvement in the planning system would be the need for Commonwealth, State and Local governments to establish a stronger partnership base, to undertake more adaptive regional planning across the Gilbert catchment.

4 The Agricultural Development Sub-Domain

Through the Queensland Department of Agriculture and Fisheries (QDAF), there is a broad state-level strategy and capacity to promote and foster agricultural development. In a more formal land use planning sense, there is an agriculturally focused State Planning Policy (SPP) with a focus on agriculture that provides a consolidated and comprehensive view of the state's interests in land use planning and development.

The SPP sets out the matters that must be addressed in local government planning schemes and regional plans. Agriculture is identified as a state interest under the 'Economic growth' theme of the SPP. The state's interest in agriculture is that "*planning protects the resources on which agriculture depends and supports the long-term viability and growth of the agriculture sector".* This includes promoting and optimising agricultural development and increasing production in key areas (QDAF 2023b).

Agricultural development, diversification or expansion of agricultural business may require completion of a development assessment or other approvals. This will require contact with the local government and consideration of requirements under the planning scheme. The local government may be the assessment manager, or the State Assessment and Referral Agency (SARA) may be the assessment manager. The Australian government may also have interests such as:

- biodiversity conservation where there is a need to determine whether an approval is needed for an action likely to have a significant impact on a matter protected under the EPBC Act; or

- native title, where there is a need to determine if there are any procedural rights for future acts under the Commonwealth *Native Title Act 1993* (section 24HA or 24KA).

Even if a proposed agricultural development activity does not require a development permit under the local council planning scheme, it may require Queensland or Australian government approvals before commencement. A proposal to construct a water bore to access groundwater, for example, will require a development approval and will need information about the management and use of Queensland's water entitlements, including water allocations, licences and unallocated water reserve volumes. A proposal that involves the clearing of native vegetation, will need to comply with Queensland Government laws on vegetation management. It will also need to account for potential impacts under the *EPBC Act.*

At the other end of the development assessment scale, a large agricultural project proposal may be too significant to be considered against the relevant local government planning scheme and therefore, be assessed under the *Planning Act 2016*. A large project such as the *Etheridge Shire Agricultural and Irrigation Precinct: Gilbert River Project Implementation Proposal* may trigger *SDPWOA* coordinated project processes.

Commonwealth investment

In the 2022 October Budget, to deliver sustainable agriculture and environmental outcomes, the Australian Government provided $1.1 billion for the next phase of the Natural Heritage Trust. As mentioned before, in the Regional Ministerial Budget Statement (2023/24), the Government also allocated $439.2 million in Trust funds to DCCEEW over five years (from 2023-24) to maintain regional partner capability, deliver benefits to Australia's threatened species, support climate-smart agriculture, and protect internationally listed World Heritage properties and Ramsar wetlands.

The Australian Government is committed to developing a climate-smart and sustainable agriculture sector and is investing $302.1 million over five years from 2023–24, through the Natural Heritage Trust to strengthen sustainable farming and natural resource management practices that reduce the agriculture sector's emissions and build climate resilience, enhances market access, and support improved environmental outcomes. The investment includes:

- $76.4 million to support national and regional natural resources management delivery partners, including peak land care organisations, and a network of Sustainable Agriculture Facilitators to ensure actions can be delivered efficiently and at scale, and to provide extension services to accelerate the adoption of climate-smart agriculture practices; and
- $158.6 million to drive impactful on-ground projects to strengthen agricultural sustainability and productivity, accelerate emissions reduction and preserve on-farm natural capital – these include landscape-scale regional priority projects and those that support the sector to transition to a low emissions future and foster sustainable agriculture (DITRDCA 2023).

Operation of the sub-domain in the Gilbert

Agriculture, broadly defined as the production of crops and the raising of livestock, is one of the key economic activities in the Gilbert catchment. Beef production was worth a total of $233.3 million in the 2010–11 financial year across the Gilbert catchment, if Carpentaria Shire is included.

The next largest value agricultural activity was hay production, valued at $1.1 million in the 2010–11 financial year. Horticulture (mangoes) was identified by the ABS as worth about $0.5 million in the 2010–11 financial year (Petheram et al 2013).

The Gilbert River catchment has long been identified as being suitable for irrigated agriculture. Soil and land assessments have identified 28,564 ha of irrigable land along the Gilbert River inside the proposed irrigation area, and further irrigable land exists downstream (Petheram et al. 2013).

Other advantages of the Gilbert catchment for irrigated agriculture include: that the Gulf region is projected to have steady/increased rainfall through climate change; historical trials coupled with current dryland and irrigated cropping activities demonstrate cropping viability and suitability for a range of diverse crops; high suitability for establishment of an organic precinct; an early cropping season that creates market windows and opportunities for premium prices within Australian markets; opportunities to integrate cropping activities with, and add value to, the established beef cattle grazing industry; proximity to Asian export markets; and, counter seasonality with agricultural production in Asia.

As mentioned previously, the availability of 467,000 ML of water for the Gilbert River catchment from the Gulf Water Plan general unallocated water reserve, is also a significant enabler of irrigated agriculture. Consequently, Regional Development Australia Tropical North (RDATN) and Etheridge Shire Council (ESC) have developed the *Etheridge Shire Agricultural and Irrigation Precinct: Gilbert River Project Implementation Proposal*, focussed on the Gilbert River region. This was achieved by undertaking planning and consultation over many years to investigate ways of enhancing the value of agricultural production in the Shire to benefit residents, the region, and the nation, through the sustainable capture and utilisation of the water resource and identifying a process of regulatory preapproval across the region (RDA TNQ 2023).

Key to the concept is the creation of an agricultural and water precinct of State significance with preapprovals across tenure, water, vegetation management, native title future acts, and cultural heritage. The proposal is an opportunity to implement best practice land management, and provide wide-ranging and lasting indigenous economic participation, training and employment opportunities.

Key emerging sub-domain strengths and challenges for sustainable development

Opportunities and challenges facing the sub-domain include the existence of reasonable resources and information to assist the establishment and management of agricultural development. However, intensive agricultural activity and development, such as irrigated agriculture, in previously undeveloped areas will have significant, and potentially major, biodiversity, cultural and social impacts.

Priorities for sub-domain improvement

Priorities for sub-domain improvement in this context again include the need to seek a better framework for regional-scale land use planning, driven by an evidence-based model of appropriate development. Beyond such planning, a more cohesive pipeline of support for securing sustainable development investment is required, starting with ongoing research and development, partnership and supply chain building, feasibility investment, and the establishment of a wider range of brokered investment sources.

Again, supporting the unique workforce needs of the Gilbert region must also be addressed to support sustainable economic growth. This involves developing skills in the local workforce, attracting skilled workers to the region, and ensuring the participation of Indigenous Australians in job opportunities (Infrastructure Australia 2021).

Importantly, the agricultural development in the Gilbert should be progressed in full (more equity-based) partnership with Indigenous Australians, with a focus on creating opportunities through education, job creation, and economic development. Ensuring Indigenous participation and benefiting Indigenous communities is an important priority for reform.

5 The Tourism Development Sub-Domain

While there is strong governmental and industry support for tourism development in Queensland, there is no legislation specifically related to the development of this industry. Within regions, tourism development activities that qualify for assessment and approval will usually be assessed and decided according to the local government planning scheme and *Planning Act 2016* processes. Very large integrated projects could attract the attention of a coordinated process under the SDPWOA.

Operation of the sub-domain in the Gilbert

Tourism is an important activity in the Gilbert catchment. The 2018 Gulf Savannah Development Report estimates the total value of tourism to the Gulf region (defined as the Etheridge, Croydon, Carpentaria, Burke, Doomadgee, and Mornington local government areas) as $69.8 million in 2017. This was based on the number of visitors (53,159), with an average stay of 13.98 days and an average expenditure of $94.02 per day.

Many of the activities tourists engaged in, such as cattle station tours, mineral baths, bush tucker tours, farm stays, bird watching tours, crocodile spotting tours and fishing charters, rely on natural resources and environmental values (GSD 2018). Tourists visiting the Gilbert catchment would comprise a smaller proportion of the Gulf total. However, major attractions in the Gilbert catchment include the Undara Volcanic, Forty Mile Scrub and Blackbraes National Parks, Blackbraes Resources Reserve, and Talaroo Hot Springs ecotourism development operated by the Ewamian people.

Key emerging sub-domain strengths and challenges for sustainable development

The Gilbert catchment has significant tourism development opportunity based on its natural and cultural values. Fishing and the general enjoyment of surface water are major attractors

for tourism in the region, with 90 % of tourists to the Gulf region citing fishing as the main reason for their visit (Abel et al. 2009). The development of water resources in the catchment may positively or negatively impact this by altering natural flow regimes, and hence, fish stocks, or by providing new water bodies, perhaps artificially stocked with fish (Petheram *et al.* 2013).

Priorities for sub-domain improvement

Again, as for other key industry sectors, the growing tourism industry in the region will rely on the protection and promotion of key natural and cultural values and assets. At the same time, however, agricultural development will bring new opportunities and infrastructure of value to tourism. As such, tourism development again needs to seek a better framework for regional-scale land use planning driven by an evidence-based model of appropriate development.

As with other sectors, again, the unique tourism workforce needs of the Gilbert region must also be addressed to support sustainable economic growth. This involves developing skills in the local workforce, attracting skilled workers to the region, and ensuring the participation of Indigenous Australians in job opportunities (Infrastructure Australia 2021).

Importantly, tourism development in the Gilbert should also be progressed in full (more equity-based) partnership with Indigenous Australians, with a focus on creating opportunities through education, job creation, and economic development. Ensuring Indigenous participation and benefiting Indigenous communities is an important priority for reform.

6 The Resources Sector Sub-Domain

Key pieces of legislation driving the development of the resources sector in Queensland include the:

- *Mineral Resources Act 1989* (Qld);
- *Petroleum Act 1923* (Qld);
- *Geothermal Energy Act 2010* (Qld);
- *Greenhouse Gas Storage Act 2009* (Qld);
- *Mineral and Energy Resources (Common Provisions) Act 2014* (Qld); and
- *Petroleum and Gas (Production and Safety) Act 2004* (Qld).

The *Mineral Resources Act 1989* (Qld) regulates resource sector activities associated with prospecting, exploring, and mining of minerals, and is the most frequently utilised resource legislation. The principal objects of this Act include to encourage and facilitate prospecting and exploring for and mining of minerals; enhance knowledge of the mineral resources; minimise land use conflict; encourage environmental responsibility and responsible land care management; and ensure an appropriate financial return from prospecting, exploring, and mining.

The environmental impacts of mining are regulated under the *Environmental Protection Act 1994* (Qld) to separate the promotion of mining from the regulation of its adverse impacts. Mines require an environmental authority under that Act to operate. Mining and petroleum extraction is exempt development under the *Planning Act 2016* (Qld). This means that assessment and approval processes and the regulation of mining and petroleum extraction operate separately from all other forms of development in Queensland.

Operation of the sub-domain in the Gilbert

There are numerous current mining and mineral exploration and development leases in the Gilbert catchment, and mines operating under these leases. Resource deposits and activities occur almost exclusively only in the upper Gilbert catchment, upstream of the confluence with the Einasleigh River. Gold is the most mined resource, whilst deposits of uranium, copper, tin, and other minerals have also been identified. Most of the upper Gilbert catchment is also under numerous mineral exploration permits, and there are several mineral development licences.

At a broader scale, the nearby Northwest Queensland Mineral Province, centred around Mount Isa and Cloncurry, but not including the Gilbert catchment, is one of the world's richest mineral producing areas containing copper, lead and zinc as well as major silver and phosphate deposits and strong rare earth potential. The Province's mining industry has been the primary driver for regional employment and economic growth. However, the Province has recently faced some economic challenges. In recent years, a number of older, larger operations have closed, and exploration activity and investment in mining projects have been impacted by lower commodity prices. In 2014–15, the industry also accounted for 67 % of the Province's economy and contributed $215 million in royalties shared across Queensland, as well as 11,110 direct and indirect jobs. The Province provided an approximately $6.6 billion gross value-add in 2010–11 (DP&C 2017).

Key emerging sub-domain strengths and challenges for sustainable development

Resources sector development is assessed and approved separately from other forms of development, and the sector resists the 'sterilisation' of areas by restricting access because of environmental or other factors. The separation of resources sector developments from Queensland's regular development planning, assessment and approval processes presents a challenge to planning for and managing the impacts of resource developments.

Priorities for sub-domain improvement

Priorities for sub-domain improvement include greater consideration of the potential expansion of the resources sector through a bio-regional planning framework that identifies catchment areas where resource activities could potentially occur and areas where resource activities can't occur.

7 The Energy Sector Sub-Domain

The Queensland energy sector utilises different types of fuels including coal, solar, hydro, geothermal, pumped hydro, gas, wind, and bioenergy. The Queensland Government is currently reviewing its state energy laws, which broadly include the:

- *Electricity Act 1994* (Qld);
- *Gas Supply Act 2003* (Qld)*;*
- *Energy and Water Ombudsman Act 2006* (Qld); and
- *Liquid Fuel Supply Act 1984* (Qld).

The objects of the *Electricity Act 1994* (Qld) are to: set a framework for all electricity industry participants that promotes efficient, economical and environmentally sound electricity supply and use; regulate the electricity industry and electricity use; establish a competitive electricity market in line with the national electricity industry reform process; ensure that the interests of customers are protected; and, take into account national competition policy requirements.

Generation of over 10 megawatts of electricity is also regulated as an environmentally relevant activity under the *Environmental Protection Act 1994* (Qld), and this Act also regulates the construction and maintenance of power lines, which are a significant source of vegetation clearing and habitat fragmentation.

The main purposes of the *Gas Supply Act 2003* (Qld) are to promote efficient and economical processed natural gas supply and to ensure the interests of customers are protected by: (i) regulating the distribution services for reticulated processed natural gas; and, (ii) providing for the making of relevant distribution network codes.

In September 2022, the Queensland Government released the Queensland Energy and Jobs Plan, which sets out a path to transform the power system by 2035 through an estimated $62 billion investment in capital projects across public and private sectors. It sets a new Queensland renewable energy target of 70 % by 2032 and 80 % by 2035.

A key component of the Queensland Energy and Jobs Plan is the draft 2023 Queensland Renewable Energy Zone Roadmap, which outlines the pathway for connecting 22 gigawatts (GW) of new wind and solar generation to provide clean, reliable, affordable power (QDoR 2023).

Commonwealth investment

The Australian Government has allocated $2.0 billion to establish Hydrogen Headstart, nationally. This program will support Australia's renewable hydrogen sector to mature by providing competitive hydrogen production contracts that bridge the commercial gap, for early projects. Much hydrogen industry growth is expected to occur in remote and regional areas. Regional communities will gain from the new employment and economic opportunities in the hydrogen sector, with spillover benefits for Australia's manufacturing sectors and related supply chains, many of which are also located in regional areas. The funding also includes $2.0 million to resource First Nations' communities to engage with hydrogen project proponents and planning processes (DITRDCA 2023).

Operation of the sub-domain in the Gilbert

The Kidston Clean Energy Hub, located at the old Kidston mine site, is the only major energy sector operator in the Gilbert catchment. It is recognised as an important component of the Queensland Energy and Jobs Plan. The four projects that comprise the Hub are as follows:

- the 50 MW Kidston Solar Project, which has 540,000 solar panels operating on a single-axis tracking system with an anticipated project life of 30 years. The Kidston site was selected in order to take advantage of the highest solar radiation zone in the country;
- the 250 MW Kidston Pumped Storage Hydro Project (K2-Hydro). The Kidston Pumped Hydro Project is the flagship project of the Kidston Clean Energy Hub. It is the first pumped hydro project in Australia for over 40 years, the first to be developed by the private sector, and the third largest electricity storage device in the country. The Kidston Pumped Storage Hydro Project, and its associated transmission infrastructure, are expected to be completed and feed into the national electricity market by early 2025;
- the 270 MW Kidston Solar 2 Project. The 270MW Kidston Solar 2 Project has the ability to integrate with the Kidston Pumped Storage Project to power the pumping cycle; and
- the 150 MW Kidston Wind Project. Genex and J-POWER are advancing the early stage of work associated with K3-Wind, including modelling the wind resource at a number of sites at the Kidston Clean Energy Hub. The development of the project will be expedited through monitoring, planning and other feasibility workstreams over the next 12-18 months. It is anticipated that the project will connect to the new 275 kV transmission line being constructed by Powerlink for the K2-Hydro, which is expected to be completed in 2024.

The combination of wind, solar and hydro completes the Kidston Clean Energy Hub and provides a globally unique integration of renewable energy needs.

The draft 2023 *Queensland Renewable Energy Zone Roadmap* does not identify any Renewable Energy Zones in the Gilbert catchment, or in any other remote or outback area of Queensland. This is in part because remote areas are not connected to the main power grid transmission and delivery infrastructure. As an alternative, the $10 million Queensland Microgrid Pilot Fund will support regional and First Nations communities by giving them access to more resilient electricity as part of the state's energy system transformation. A microgrid is a small-scale, stand-alone electricity system that generates and supplies electricity to multiple customers (QDoR 2023).

Key emerging sub-domain strengths and challenges for sustainable development

Energy sector development is assessed and approved separately from other forms of development, and there would be value in ensuring a stronger bio-regional approach.

Priorities for sub-domain improvement

Priorities for sub-domain improvement would include greater consideration of the potential expansion of the energy sector through a bio-regional planning framework.

The Social Development Domain

1 The Aboriginal Land Rights and Nation Building Sub-Domain

Providing land justice for Aboriginal and Torres Strait Islander people has long been an important social development agenda in Australia. In Queensland, land and sea justice outcomes are driven by the Queensland *Aboriginal Land Act 1991* (Qld) and the Commonwealth *Native Title Act 1993* (Cth). Both provide the main legislative basis for Aboriginal land rights in Queensland.

The main objects of the *Native Title Act 1993* (Cth) are to: provide for the recognition and protection of native title; establish ways in which future dealings affecting native title may proceed and set standards for those dealings; establish a mechanism for determining claims to native title; and, provide for, or permit, the validation of past acts, and intermediate period acts, invalidated because of the existence of native title.

Native title claims processes, conducted by Native Title Representative Bodies (NTRBs), result in the determination of areas where native title continues to exist, and the establishment of RNTBCs to hold and manage native title rights. The issuing of Future Act Notices (FANs) for acts that may affect native title rights and interests, and the negotiation of Indigenous Land Use Agreements (ILUAs), are also provided for by the *Native Title Act 1993*.

The *Aboriginal Land Act 1991* (Qld) (ALA) provides for the grant, and the claim and grant, of land as Aboriginal land, and for other purposes (*Aboriginal Land Act 1991* (Qld)). ALA processes result in the transfer of land from transferable tenures to Aboriginal freehold tenure held by an Aboriginal trustee corporation. Rights to timber and gravel are usually included with transfers of land to Aboriginal freehold tenure. Aboriginal freehold land may be leased to another party for any purpose for a period of up to 99 years.

The *Water Act 2000* (Qld), amongst other things, provides for the preparation of catchment-based water plans that, in some cases, include an Indigenous water reserve for Indigenous community purposes. The Gilbert River catchment is one of eight catchments within the Water Plan (Gulf) 2007 area, and the plan will be in force until November 1, 2027. The total Gulf Indigenous reserve totals 30,550 ML, including 17,000 ML for the Gilbert River catchment. Unallocated water held as an Indigenous reserve for the Gilbert River catchment may be granted only for helping Indigenous communities in the Gilbert River catchment area, who may then, with Ministerial approval, lease a volume of their water licence to another party. Indigenous and other parties may also access the Gulf's general unallocated water reserve, which includes 467,000 ML for the Gilbert River catchment.

The *Aboriginal Cultural Heritage Act 2003* (Qld) provides effective recognition, protection and conservation of Aboriginal cultural heritage through the establishment of Aboriginal Cultural

Heritage Bodies whose main role is to identify the people with cultural authority who can speak for the cultural heritage of an area if land use or development is proposed for that area.

To effectively manage these legally recognised rights in land and water, to care for Country, and to protect contemporary and traditionally recognised values, rights and interests, Aboriginal groups often have an aspiration to re-establish their traditional territory and governance structures. However, there is limited support or guidance for this First Nation building aspiration, and no supportive government for this purpose exists beyond the creation of rights and interests in land and sea through implementation of the Acts outlined above.

Traditional Owner nation building activities that are relevant to environmental protection and biodiversity conservation could include responsibility for, or participation in, activities such as management of protected areas, fire management, pest and weed control, carbon sequestration, land rehabilitation, threatened species protection, cultural heritage protection and management, and, monitoring and reporting within the area of their traditional country.

To support participation in these types of environmental protection and biodiversity conservation activities, several opportunities exist for Traditional Owners, including the Queensland Government's Indigenous Land and Sea Ranger program, the declaration of Indigenous Protected Areas (IPA), and the negotiation of Traditional Use of Marine Resources Agreements (TUMRA).

Closing the Gap

The Australian Government's Prime Minister and Cabinet portfolio, works in partnership with First Nations people and communities to shape the design of policies, services, and the Closing the Gap agenda across the Australian Government. The portfolio is responsible for setting the direction of Indigenous affairs policy across the Australian Government, as well as delivering a number of specific funding programs.

The Government will expand the Indigenous Rangers Program (IRP), grow the Indigenous rangers' sector, and provide funding for junior ranger initiatives. The IRP expansion will double the number of First Nations rangers by the end of the decade and work towards greater representation of women in ranger positions. This will have positive impacts in regional, rural, and remote areas nationally, as it will encourage applications from regions currently without First Nations rangers and increase opportunities for rangers in dedicated Indigenous Protected Areas. It will create First Nations ranger jobs in areas where employment opportunities may be limited and will improve Indigenous-led land management services in regional, rural, and remote communities, enabling them to be better positioned to reduce or respond to natural disasters.

The portfolio is committed to stimulating economic activity in regional Australia and helping local economies thrive. Indigenous Business Australia assists First Nations people to construct new homes through the Indigenous Home Ownership Program and partners and invests in Aboriginal and Torres Strait Islander businesses. The Indigenous Land and Sea Council assists First Nations people to realise economic, social, cultural, and environmental benefits that ownership and management of land and water can bring.

The portfolio works closely with local service providers and communities to design and deliver services to improve the lives of First Nations people across metropolitan, regional, and remote locations (DITRDCA 2023).

Operation of the sub-domain in the Gilbert

Native Title

The upper Gilbert River catchment, down to the junction of the Gilbert and Einasleigh Rivers is within the jurisdiction of the North Queensland Land Council. The Gilbert River catchment downstream of this junction is within the jurisdiction of the Carpentaria Land Council. The roles of both Land Councils include acting as the Native Title Representative Body for the area under their jurisdiction and undertaking native title claims processes in these areas.

As a result of the activities of the North Queensland and Carpentaria Land Councils, there have been five native title determinations in the Gilbert catchment to date. Native title has now been determined for about 90 % of the Gilbert catchment area. As such, Registered Native Title Bodies Corporate (RNTBCs) areas now cover much of the catchment. The vast majority of this determined area is non-exclusive native title, with a few small areas of exclusive native title.

In the Gilbert catchment, these native title determinations include:

- east of the Gilbert River, upstream of the junction of the Gilbert and Einasleigh rivers− native title rights and interests confirmed by determinations QCD2013/006 and QCD2013/007 are managed by the Ewamian People Aboriginal Corporation RNTBC, on behalf of Ewamian people;
- west of the Gilbert River, upstream of the junction of the Gilbert and Einasleigh rivers − native title rights and interests confirmed by determinations QCD2012/012 and QCD2012/013 are managed by the Tagalaka Aboriginal Corporation RNTBC, on behalf of Tagalaka people; and,
- downstream of the junction of the Gilbert and Einasleigh rivers − native title rights and interests confirmed by determination QCD2022/009 are managed by the Mpundwithal Aboriginal Corporation RNTBC, on behalf of Kurtijar people.

The extent of native title rights and interests throughout the Gilbert River catchment mean that some types of proposed development will potentially affect native title rights and interests, so native title notification, and sometimes consent for the proposal, will be required, usually through the negotiation of an Indigenous Land Use Agreement.

Aboriginal Freehold Land

Under the *Aboriginal Land Act* in the Gilbert, there is one 2.3 ha block of Aboriginal freehold in Georgetown, held by the Ewamian Aboriginal Land Trust. In addition to Aboriginal freehold land, Aboriginal corporations also hold tenured interests in other land in the Gilbert catchment including at Talaroo and Delta Downs. Because these are private rights and interests in land, the availability of information is limited.

Aboriginal Cultural Heritage

Of the three Gilbert catchment RNTBCs, only the Tagalaka Aboriginal Corporation RNTBC is also a registered Aboriginal Cultural Heritage Body. Tagalaka's cultural heritage body jurisdiction aligns with its RNTBC jurisdiction, plus some adjoining undetermined areas, which amount to less than 10 % of the Gilbert catchment. This means that less than 10 % of the Gilbert catchment is serviced by an Aboriginal Cultural Heritage Body, so most of the catchment does not have one to serve as the first point of contact for cultural heritage matters and to identify the Aboriginal parties for the area.

Indigenous Water

The Gulf Water Plan (2007) allows for the granting of Indigenous Reserve water for a purpose that supports the social and economic aspirations of Indigenous groups in certain catchments. However, it does not define who is eligible to access the Indigenous Reserve.

Caring for Country and Nation Rebuilding

Under the Queensland Government's Indigenous Land and Sea Ranger program the Ewamian Aboriginal Corporation has established the Ewamian rangers, based at Talaroo Station near Georgetown, who care for savannah lands in the upper Gilbert and Einasleigh River catchments. Work of the Ewamian rangers includes identifying and protecting cultural heritage sites, recording and revitalising language and culture, protection of the Talaroo hot springs through eradication of weed infestation and removal of damaging infrastructure to reinstate natural spring flows; conducting prescribed burns to protect ecological and cultural sites; working with QPWS on archaeological surveys and cultural heritage; and, developing management protocols for national parks (Queensland Government 2023).

The Carpentaria Land Council Aboriginal Corporation hosts the Normanton Land Sea Rangers from the Kukatj, Gkuthaarn and Kurtijar Traditional Owner groups who protect natural resources on Country in the southern gulf plains. The rangers deliver a range of on-ground activities in an area from Staaten River to Leichardt River, including implementation of the Gkuthaarn and Kukatj and Kurtijar Country plans, monitoring of migratory shorebirds and documentation of breeding colonies of waterbirds, traditional knowledge transfer, recording of flora and fauna species, turtle nest surveys, managed burns to manage weeds and protect cultural and ecological assets, biosecurity surveillance including of marine pests along the coastline, and plant and animal health assessments.

Kurtijar people have been successful in securing an internationally recognised Eastern Asia-Australasian flyway site for migratory shorebirds on Delta Downs station in a coastal region adjacent to the Gilbert River floodplain (East Asian-Australiasian Flyway Partnership 2017).

No Traditional Use of Marine Resources Agreements (TUMRA) or Indigenous Protected Areas (IPA) have been developed under the *EPBC Act* anywhere in the Gilbert River catchment or Gulf waters adjacent to the Gilbert. However, a proposal by Carpentaria Land Council for the Kurtijar Sea Country IPA, which includes the coastal area of the Gilbert catchment, and a proposal by the Ewamian People Aboriginal Corporation for the Talaroo IPA, are currently IPA consultation projects.

Key emerging sub-domain strengths and challenges for sustainable development

The determination of native title rights and establishment of RNTBCs has re-established the presence of Aboriginal people across most of the Gilbert catchment. The native title rights mean that native title holders will have a degree of participation in land use and development decision-making in most of the catchment, and they may also be able to negotiate employment and other benefits from development. The RNTBCs provide a corporate presence that could be built upon to help re-establish First Nations in the Gilbert catchment, and participation in ranger and other land management programs also helps the move towards rebuilding First Nations.

Priorities for sub-domain improvement

The Aboriginal land rights and nation building sub-domain should prioritise processes to finalise the determination of native title in undetermined parts of the Gilbert catchment and establish and extend RNTBCs into new areas where native title is determined to continue to exist. Existing and future RNTBCs across the Gilbert should also take on the role of Aboriginal Cultural Heritage Bodies. The determination of native title and establishment of RNTBCs and ACHBs will provide for both the protection of Aboriginal rights and interests in land, and for the facilitation of development assessment and approval processes. The participation of Aboriginal ranger groups in Gilbert catchment land and sea management should continue to be supported and expanded.

The potential rebuilding of First Nations within the Gilbert catchment is supported by an apparent general agreement regarding Country boundaries (based on native title determinations) and corporations established to provide the basis for First Nation governance. Additional guidance about rebuilding First Nations and how they should operate will be required to facilitate the rebuilding process.

2 The Education and Workforce Development Sub-Domain

Australia's school-based education system generally consists of 13 years of schooling, with attendance required from age 6 until age 16. Education is a State and Territory responsibility in Australia. However, the education system is funded by both the State and Australian governments, with the National Productivity Commission delivering an annual Report on Government Services (Productivity Commission, 2023).

The Council of Australian Governments Education Council, which has representation from State and Territory Governments and sets key policy directions, provides a cohesive forum through which strategic policy on school education, early childhood and higher education can be coordinated at the national level and through which information can be shared, and resources used collaboratively, to address issues of national significance (DFAT 2017).

After almost a century of Australian history during which a coherent education program was absent at the national level, a National Curriculum Board (then Australian Curriculum, Assessment and Reporting Authority or ACARA) was established in 2008, comprising representatives from all States and Territories, and with a remit to develop K-12 courses in Mathematics, Science, History and English (Reid, 2019). This became the first independent

statutory agency established by Commonwealth legislation to oversee the development and implementation of the national curriculum, student testing, and the public reporting of school data. As part of the national curriculum, the Commonwealth provides national policy direction and policy priority setting, while the State and Territory Governments are responsible for delivering school-based education.

The education system is also focused on university and vocational development. The federal government is proposing a five-year National Skills Agreement starting in January 2024, aimed at developing high-quality vocational education and support for Australians to acquire the skills needed for a thriving economy. This was triggered by the need for a new agreement (PC 2020).

Vocational Education and Training (VET) in Australia is primarily the responsibility of the Australian Government and the individual State and Territory Governments. The Australian Government provides funding and regulation support to government-funded Technical and Further Education (TAFE) institutes, adult, and community education centres, and private Registered Training Organisations. VET courses are designed to provide students with practical skills and experiences in a wide range of employment fields.

Tertiary education in Australia includes both higher education and VET. The Australian Government, through the Department of Education and Training (DET), provides funding and regulation support for this. In terms of regulation, a national framework (the Australian Qualifications Framework) covers qualifications in post-compulsory education by linking school, vocational, and higher education qualifications into a single national system. Universities in Australia are known for their combination of research and teaching, with research being a distinctive aspect. In terms of funding, the Australian Government provides resources for the operation of public universities through grants, scholarships, and special purposes such as teaching and research programs.

The Australian Universities Accord is a newly emerging and longer-term commitment among stakeholders in Australian higher education to address major challenges and opportunities in the workforce development sector and strengthen the system over time (Commonwealth of Australia 2023). It aims to drive lasting alignment between Australia's high-quality higher education system and national workforce development needs. The Accord seeks to increase equity of opportunity, meet future skills needs, and deliver high-quality research that is useful to communities, industry, and governments. In terms of workforce development in Australian regions, the Accord recognises the value of regional universities in developing highly skilled regional workforces and in delivering research and innovation outcomes for regional industries (Regional Universities Network 2023). It acknowledges the need for addressing entrenched sectoral inequalities through regional differentiation and policy nuance.

Finally, Australia's skilled migration system is structured around various visa subclasses and points-based systems designed to attract highly skilled and qualified individuals from around the world to live and work in Australia to meet labour market needs. The most required professions for regional skilled visas and State nominations in Australia are centred around key industries and regional needs.

Operation of the sub-domain in the Gilbert

There are three state schools in the Gilbert at Georgetown, Forsayth and Mt Surprise, offering schooling up to grade 6 (Queensland Government 2020). There are no high schools or tertiary facilities in the catchment, so students must leave the region for secondary and tertiary education.

Key emerging sub-domain strengths and challenges for sustainable development

Regionally, there is a trend for students to leave the region for secondary or tertiary education, resulting in a loss of potential labour from the region's workforce. This, along with the low retention of students to higher levels of secondary school, may explain why the highest level of schooling achieved by residents in the Gilbert catchment is lower than the state average. Making the situation worse, the pool of post-school qualifications is not sufficient to meet the requirements of the employment market, leading to shortfalls in labour supply across various sectors. Other challenges include remoteness, distances between major towns, cultural barriers facing Aboriginal communities, and limited resourcing.

There is a need for improved education facilities, better access to quality education, and increased engagement with further education and skills development (Infrastructure Australia 2022). Within the region, the capacity of individual schools to implement strategies is highly varied, with some lacking critical financial, human and infrastructure resources.

Adding to these problems, characteristic challenges for the workforce development in the region include: (i) affordability of housing and accommodation; (ii) limited access to quality social services; (iii) a lack of place-based skills development; and, (iv) a need to increase; workforce participation and diversity.

Priorities for sub-domain improvement

Weaknesses in the education and workforce development system in the region increase regional inequality, exacerbating disparities in educational opportunities and outcomes among students. A consequence of failure in this system is that workforce development will be affected in terms of skills mismatch, low workforce productivity, and an increased dependency on imported talent that is hard to secure within the region for a range of liveability reasons. A failure in system management would lead to worse learning environments for the region, with the risk of overcrowded classrooms, outdated materials, and insufficient support services for students.

To support remote regions such as the Gilbert, the education system needs to continue to increase equity in education towards First Nation and remote people, across the public school system. Improving the national curriculum by increasing the focus on civic and critical thinking skills would aid future policy and research capacities and help people develop the capacities needed to meet the growing remote area workforce challenges of contemporary times (Reid 2019).

In the shorter term, however, more strategic and place-based approaches to community building and workforce development are going to be key to lifting innovation for solutions within the region.

3 The Human Service Sector Sub-Domain

The human service sector represents the wide range of socially-oriented services required for communities to be liveable and functional. In addition to education services, these include health provision, housing, policing, and a wide range of social service delivery agents.

Socioeconomic and cultural factors specific to rural Australia are key influences on the underlying human service challenges in the Gulf region and similar places. These range from individual-level factors (e.g., rural stoicism, poverty and substance use) to neighbourhood-level social characteristics (Beard et al. 2009). People in remote areas are more likely to die from lung cancer, chronic heart disease, stroke, suicide, injury, poisoning, road traffic injury, diabetes, asthma, and chronic obstructive pulmonary disease. In remote areas, higher death and hospitalisation rates are recorded due to hazardous and harmful consumption of alcohol and tobacco smoking (Kreger and Hunter 2005).

Rural communities generally have socioeconomic and cultural characteristics that are distinct from non-rural communities, evidence that socioeconomic disadvantage is a key driver of rural health disparities (Beard et al. 2009). The rate of suicide in rural Australia indicates that there is a high prevalence of mental health issues, and certain occupations are associated with a higher risk of mental disorders. Programs to combat mental health issues in rural areas have focused on farmers (Fragar et al. 2010). Rural workers also have relatively high levels of psychological distress, and whilst much attention has been focused on those working on farms, so do the rural unemployed. Early intervention and vocational rehabilitation programs need to be developed in rural communities to serve this hard-to-reach, but needful, rural population (Fragar et al. 2010).

The relationship between levels of mental health and well-being with employment and occupational status of rural residents indicates that the highest levels of distress and functional impairment are in those permanently unable to work and the unemployed (Fragar et al. 2010). These issues are exacerbated by economic and housing challenges in such regions.

Operation of the sub-domain in the Gilbert

In the Northern Gulf, 67.4 % of the region was classified as ‘Outer Regional Australia’ and 32.7 % as either ‘Remote Australia’ or ‘Very Remote Australia’ (QGSO 2014). Data shows that the number of aged care, childcare; and hospital services is significantly lower than numbers across Queensland (OESR, 2012), with medical clinics only in Georgetown and Forsayth. In particular, Croydon and Etheridge Shires do not have any aged care facilities. The Croydon, Etheridge, and Kowanyama Shires also do not have fire stations (QGSO 2014). Given the relatively well-understood farm debt crisis in the region (and more widely in regional Queensland), some 71 % of surveyed producers would like improved access to financial support, 45 % would like access to Centrelink assistance, and 54 % access counselling for mental health or depression (Rural Debt and Drought Taskforce 2016).

The reduction in Frontier Services social service capacity within the region over recent years has also notably diminished coordinative capacity and flexibility within the services sector.

In general, data about services is not benchmarked across the regional community.

Key emerging sub-domain strengths and challenges for sustainable development

The lack of services within the region exacerbates the viability of agricultural enterprises, as well as the general liveability of the region. This significantly influences the capacity of the region to attract the skilled workforce needed for effective economic growth and sustainable natural resource management. Presently, housing access is a particularly acute regional social service problem.

Priorities for sub-domain improvement

Effective resolution of regional land use and natural resource conflicts will be essential to shift the economic dilemma facing the communities within the Etheridge, Croydon, and Carpentaria shires. A longer-term strategic approach to monitoring regional community resilience is required, as well as an associated strategy for progressing the development of community building strategies.

Appendix 2: References

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