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

Solutions Report

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Cover images

Front: Etheridge River, Georgetown Qld 2023. Credit B. Carlson, CRCNA.

Back: Peanuts, Georgetown Qld March 2023. Credit B. Carlson, CRCNA.

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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

Resolution of 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 represents the integrated achievement of the UN's Sustainable Development Goals (UNSDGs) and the Ecologically Sustainable Development (ESD) legislative concept. Operationalising this locally relies on applying emerging concepts of Environment, Social and Governance (ESG) thinking at the development project scale.

This **Solutions Report** progresses innovative new directions that arise from our **Analysis Report** of the regional-scale planning and development assessment system in the Gilbert River in Queensland's Gulf of Carpentaria. We have proposed these solutions to explore opportunities for improving the system of planning and development assessment across northern Queensland and northern Australia in general. The work has been developed closely with: the Commonwealth's Department of Climate Change; Energy, Environment and Water (DCCEEW); two 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).

Our **Solutions Report** seeks to propose ways to resolve key issues affecting Queensland's Gilbert River catchment, just one of three sentinel case studies exploring these issues across the northern Australian landscape. The second is the Douglas Daly Region in the Northern Territory (NT), and the third is 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 help inform 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)*.

Our recent **Analysis Report** has explored the many complex issues facing current decision-making processes in the Gilbert River catchment, showing 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 **Solutions Report** builds on this work to propose, at the very least, the application of new mapping and facilitative approaches to help build cross-governmental and regional consensus about appropriate development models. It also explores the need to build long-term local institutional capacity for ecosystem service market attraction and offset management to deliver landscape-scale conservation works.

This combined work in the Gilbert, and sibling analyses in the Douglas Daly and Pilbara, are aimed to 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. It also means securing the social, cultural and economic interests of regional communities. Previous analysis of these issues across northern Queensland have suggested the need to unpack these issues in more detail within case regions (see Dale and Marshall, 2020; Dale et al., 2022). Based on deeper consequent dialogue with key State agencies and DCCEEW, to explore these issues further in-region, we undertook a detailed analysis of the governance system concerning regional planning and development assessment processes that influence sustainable development outcomes within Queensland's Gilbert River catchment (see Dale et al, 2024). This more detailed analysis has specifically delved further into:

1. A detailed Governance Systems Analysis of the current wider system of governance influencing catchment outcomes with implications for important *EPBC Act* matters; and,
2. 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).

Outlined in our underpinning **Analysis Report** (Dale et al., 2024), our combined findings have enabled us to progress the development of some more targeted and key solutions that, if collaboratively progressed, will strengthen the regional planning system affecting landscape-scale outcomes in the Gilbert River catchment (see Figure 1). This process has enabled shared dialogue with the wider regional community regarding the prioritisation of stages of continued research collaboration and support within the catchment beyond the end of June 2024. These are outlined here in our proposed **Solutions Report**. 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 and development system across northern Australia.

As outlined in the **Analysis Report**, the Gilbert River sports a range of diverse resources and cultural values. The combined non-Indigenous and Indigenous community of the Gilbert comprises around 2,000 people. Very importantly, the region encompasses the traditional lands of the Kurtijar, Ewamian and Tagalaka Peoples. The catchment covers approximately 46,000 km^2 in northwest Queensland and has a predominantly monsoonal and highly variable climate. It drains westwards from the western edge of the Wet Tropics into the Gulf of Carpentaria. There are major agricultural opportunities associated with significant volumes of available water allocated for consumptive use. The largest current existing uses of land and water are pastoral operations, mines, tourism and fishing. While agricultural and

industrial water use is currently very limited, there are a few emerging agricultural development concepts in parts of Gilbert and some proposals for large new cropping-based developments. Pressure is also starting to emerge in relation to potential wind and mining 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. There has also been limited formal recording of cultural values within the catchment, despite the region's great significance to its Traditional Owners (Lyons & Barber, 2018).

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 & Faggotter 2021, Burford et al. 2021a; b; Lowe et al. 2022; Venarsky et al. 2022). Migratory shorebirds that frequent the region include critically endangered and endangered species and other *EPBC Act* listed MNES.

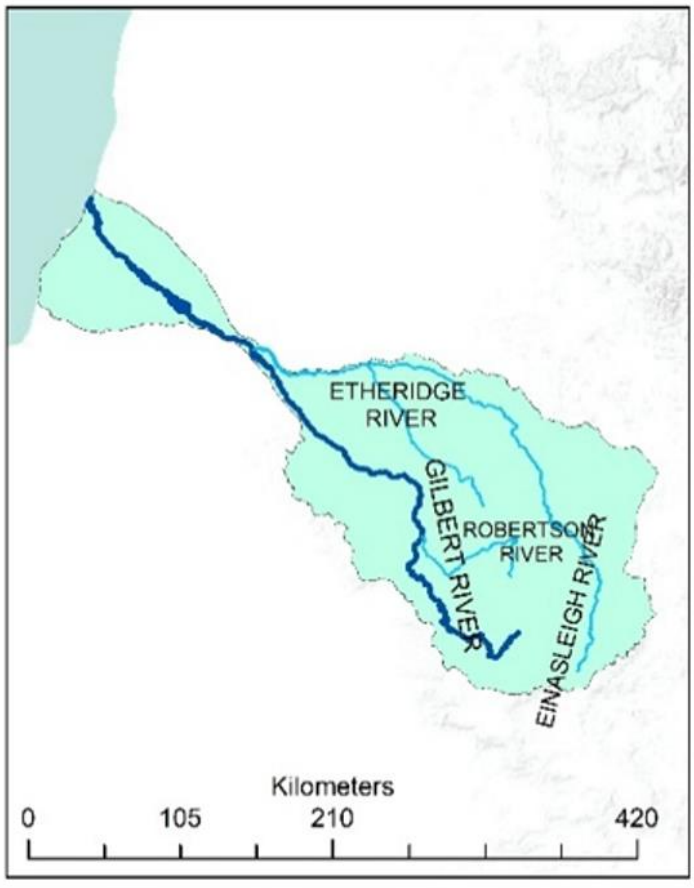

Figure 1: Map of the Gilbert River catchment (Supplied by TropWATER JCU).

As mentioned above, the Gilbert River is earmarked for significant water-based development, primarily in the form of water extraction and water capture for irrigated agriculture and agricultural value-adding. Preliminary cotton and sorghum 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. 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).

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. 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.

In summary, our previous Analysis Report finds that 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). 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.

2 Methods and approach

As a foundation for determining how to approach governance systems improvement for the Gilbert's regional planning and development assessment system, an analysis of the complex governance system underpinning sustainable development-related outcomes in the Gulf was applied to help focus attention on those system reforms that would deliver the best social, economic, cultural and environment outcomes for the catchment (see Dale et al., 2024). 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. 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 in Dale et al. (2024). To enable additional depth to this analysis, however, we also interviewed a purposeful sample of some 14 key stakeholder organisations 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. Targeted organisational groups included:

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

To enable consideration of potential solutions, a thematic analysis of the synthesis materials was then undertaken at the end of the interview process, applying key aspects of the GSA framework. These potential solutions were also discussed in detail within a meeting of key catchment stakeholders in May 2024, and through more direct exploratory dialogue with others.

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.

3 Governance systems analysis results overview

Broad outcomes from the governance system sub-domains

Our detailed Governance Systems Analysis found that while the region's outdated but formal regional plan is currently under review, most development decisions are both promoted or regulated by more fragmented pieces of natural resource management legislation. At the more general descriptive level, emerging results of the literature-based GSA work in the Gilbert particularly illustrate that:

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

Stakeholder views of system function and improvements

Most stakeholders were able to identify the fact that there is no single regional planning system in the catchment. Instead, regional planning activity in the Gilbert is made up of 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 (i.e., by particular Commonwealth or state agencies or from within the region itself). Consequently, in targeted interviews, participant responses were influenced by each stakeholder's particular roles and responsibilities. Some of the key themes that emerged from people's views of the strengths of the current system included:

- the significant nature of the agricultural development opportunity available;
- the right regulatory arrangements being broadly in place and operating;
- that there are good people, institutions and services available with the system;
- that there is new technology to measure and support better system measurement; and
- the potential to explore cumulative impacts of development at the regional scale.

Some of the key themes that emerged with respect to people's views of the weaknesses of the current system included:

- the existence of institutional silos and fragmented regulation;
- a lack of cohesive capacity within particular sectoral interests;
- a lack of political understanding of the issues facing Gulf communities;
- conflicting visions of the future of sustainable development of the Gilbert;
- a lack of institutional and human capacity supporting Traditional Owners and other key sectors;
- general regional inaccessibility for engagement and scientific activity, including insufficient information sharing and knowledge integration;
- insufficient thinking about how to integrate bio-regional and NRM planning; and
- high costs inherent in the development approval system with a low chance of success.

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

- 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;
- the potential to drive measured offsetting within the region by building on effective measurement and reporting systems;
- the need for clear bio-regional, precinct or mosaic planning that articulates development and protection zones and improved triggering arrangements for agricultural development;
- investment in the capacity of key sectors (e.g. Traditional Owners, the pastoral sector, etc.);
- integrated planning for water development;
- more integrated information management systems linked to regional decisions;
- effective measurement and long-term monitoring through regional metrics; and
- the need for improved models in Traditional Owner engagement.

Implications from the combined results

Clear points that emerged regarding strengths and weaknesses within the system have included:

- highly competing and fragmented planning visions;
- declining biodiversity conditions despite limited development;
- a lack of knowledge of terrestrial, aquatic and marine interactions;
- the lack of a cohesive framework for regional planning and trade-off analysis;
- poorly conceptualised ecosystem service offset and market frameworks;
- capacity limitations for the regional engagement of multiple sectors; and
- limited strategic investment in Traditional Owner nation building.

As outlined in the **Analysis Report**, the likely implications of not resolving these problems associated with the current regional planning and development assessment system include:

- continued economic and social decline of the region's rural communities;
- continuing slow decline of the region's natural and cultural values;
- further marginalisation of Traditional Owners and the pastoral industry in key decisions being made about the region; and
- the risk of majorly unsustainable development decisions being made in the future.

4 Potential systemic interventions

Without system-wide improvements, the future economic, social and environmental trajectories of the Gilbert River region and its communities will likely be challenging. Based on the key strengths and weaknesses and possible solutions identified in our assessment of the wider regional planning and development assessment system within the region, the following provides a potential but preliminary set of longer-term pathways for achieving ESD outcomes for the Gilbert.

These following considerations help establish the priorities for ongoing discussion between the CRCNA and NESP about the development of longer-term partnership arrangements between DCCEEW, State agencies, CRCNA, NESP Hubs, RDA TNQ and ESC to progress these issues.

The alignment of key regional planning activities within the catchment

There is significant fragmentation among the various regional planning-related instruments *and* conservation decision-making efforts in the catchment. This means that major unresolved tensions exist between the opportunity to develop the region's substantial resources and the necessity for improved environmental conservation outcomes. The likely long-term scenarios emerging from this lack of cohesive and collective leadership on these issues are likely to include economic stagnation within the region's communities and slowly declining natural and cultural values. Cohesive Federal, State and local partnerships are needed to avert such real and emerging problems.

It will be important for the Commonwealth and the State Governments, in particular, to seek to build more cooperative, purposeful and evidence-based partnerships with respect to determining the future of the region, primarily involving Local government, industry and community sectors, Traditional Owners and researchers. Commonwealth involvement in such partnerships, however, needs to be integrated across various DCCEEW programs (e.g. Natural Resource Programs, EPBC responsibilities and the National Water Grid Authority) and wider Commonwealth functions. Similarly strong integration of Queensland agency efforts is, at the very least, needed across the Department of State Development, Infrastructure Local Government and Planning (DSDILG&P), the Department of Agriculture and Fisheries (DAF), the Department of Environment and Science (DES) and the Department of Regional Development, Manufacturing and Water (DRDM&W).

1. These partnerships need to be given form and function by both seeking to integrate contemporary and active regional planning activities that are currently poorly integrated. In particular, this needs to involve developing a mechanism to integrate the emerging focus or the regional planning efforts:

   The emerging Far North Queensland Regional Plan Review (See DSDILP&P, 2022) needs greater strategic and implementation impetus. This regional plan sets the long-term, strategic direction for how a region will grow and respond to change over time. This is developed through the State establishing a statutory policy framework and

associated spatial land use and infrastructure mapping layers. It is, however, a high-level exercise that will likely not resolve complex tensions within the landscape in the short to medium term;

2. The emerging review of the Gulf Water Plan and progression of the Gulf Regional Water Assessment (see Butcher, 2024). These processes will review the current water allocations within the region and explore and assess potential water development options. The Regional Water Assessment, however, may be limited in its ability to assess these options if they are not developed in a more widely agreed regional and bio-regional planning context;
3. Emerging Commonwealth regional interests under the *Environment Protection and Biodiversity Conservation Act*. Integrating Commonwealth interest at this point in the other State-based regional planning processes that are happening would ensure the early integration of, and accounting for, the Commonwealth's emerging focus on higher development assessment standards *and* the cumulative impact of multiple developments;
4. Exploration of the role of developing and integrating area management planning for vegetation management consistent with the Queensland *Vegetation Management Act 1991*;
5. Reconsideration of the long-term role and alignment of existing regional NRM planning processes in the Gulf Savanna NRM region; and
6. Integration of these issues with the emerging development interests of the Etheridge Shire Council through its proposed Etheridge Ag Precinct Proposal (RDA TNQA, 2024).

In short, what is being suggested here is that an independent, third party facilitated dialogue be held to urgently explore how these processes might explicitly be able to integrate efforts over the coming three-year period (e.g. combining the most effective aspects of State regional planning, Federal bioregional planning, State water planning and more localised development precinct planning).

Apart from ensuring a stronger focus on aligned regional visions, such an approach would also need to focus attention on improving lower-scale development decision-making, the integrated operation of carbon, biodiversity and other offsetting frameworks, ecosystem service market coordination and coordinated delivery of on ground conservation actions over long time periods.

Managing effective trade-offs between development potential and biodiversity risks

While the above action might establish the basis for the integration of planning efforts between agencies, within this framework, there is a need to establish a basis for trade-off discussions across the region's key stakeholders. This particularly means all three levels of government working with traditional owners, key industry sectors, regional development organisations, natural resource and environmental interests. Emerging, evidence-based partnerships are critical to the development of effective and trusted frameworks for trade-off analysis and decision-making between development potential and biodiversity risks. Such frameworks might initially be better focused on reaching conceptual, but catchment-scale agreement, about preferable development models that help refine:

- aspirations within the agricultural land-holding community for irrigation development;
- where real opportunities for development might be acceptable within the catchment (i.e. 'the where' question);
- the most appropriate forms, or model of development (e.g. innovative off-stream storage versus large scale in-stream infrastructure development) that will minimise marine, aquatic and terrestrial impacts (i.e. 'the what' question); and
- aligned infrastructure and service planning to ensure high value economic outcomes emerging from new development within the region (i.e. the how question).

These sorts of trade-off analysis activities, starting with the design of appropriate conceptual development frameworks, will eventually be needed to inform more detailed bio-regional and precinct planning activities. Again, it is suggested that such trade-off negotiations are carefully facilitated by a skilled and independent third-party facilitator. This would ensure:

- the framing of trade-off negotiations is consistent with the needs of higher-level planning arrangements discussed above;
- that all stakeholder interests are able to effectively determine the most appropriate representational arrangements and internal sector feedback arrangements; and
- all parties involved in trade-off negotiations remain accountable for decisions taken and actions agreed upon during the course of the trade-off negotiation process.

The implications emerging from this work would necessarily feedback up into the emerging regional planning, bioregional planning, water planning and regional water assessment processes discussed.

Trialling new approaches to ecosystem service market and offset framing

If the above key actions are indeed successfully negotiated, then the implementation of effective bio-regional and regional planning outcomes could lead to improved sustainable development decision-making within the Gilbert catchment. If insufficient attention is paid to effective funding and delivery of aligned conservation works, however, then the best spatial planning in the world could still lead to problematic cumulative impacts and ecosystem decline. In parallel to planning, capacity must be built locally, within the catchment, to design and deliver long-term landscape-scale conservation planning, investment attraction and coordinated on ground delivery.

Some of these issues are broadly articulated in Dale (2014), and consistent with this, this means that at the very least, the following preconditions of success need to be institutionalised:

- the creation of a bilaterally agreed, long-term institutional capacity for catchment and conservation planning, including the identification of: (i) landscape values that need active management; (ii) targets for the achievement of ecosystem health across these assets; (iii)

long-term and costed works programs to secure targets; and (iv) well-defined and stable delivery partnerships. Existing institutional arrangements for regional NRM management (i.e. via enhanced approaches to supporting Gulf Savannah NRM) would seem to be the logical starting point for reviewing and strengthening these arrangements;

- core long-term and stable investments would also be needed to build the delivery capacity of the region's Traditional Owner institutions, as well as building conservation delivery through pastoralists, farmers and specialist landscape restoration service providers. In the pastoral and farming sector, in particular, significant value could emerge from delivering targeted ecosystem service payments, for example through Agforce's AgCarE Program; and
- an agreed approach for designing appropriate offset frameworks linked to development activity within the region, and the channeling of these offset arrangements into long-term regional work programs. This needs to be complemented by more focused and regional-scale planning for the targeted attraction of global ecosystem service markets, private conservation sector investors, the coordination of regionally-based ESG and voluntary (i.e. Landcare-sector) efforts, and continuing, but more coordinated Commonwealth and State Investment programs focused on conservation and cultural outcomes;
- long term monitoring of improvements across the region, feeding into adaptive management of the conservation planning and delivery systems discussed above.

The Gilbert is largely a landscape with minimal land clearing, but one that is also suffering significant natural resource impacts from continuing inappropriate cattle grazing regimes in some places and feral and invasive species impacts (e.g. weeds and pigs). As such, there is a need for innovation and the design of refined offset frameworks for any agreed vegetation clearing. This would provide both carbon and biodiversity offset benefits. There is a need for a conceptual shift toward investment in improved ecosystem health across the wider bioregion, rather than like-for-like vegetation offsets.

To make the above preconditions work, the identification and structured long-term development of a works program and associated investment attraction and deployment plan is needed to grow the region's most logical on-ground works delivery capacities and agents. To get effective engagement and long-term capacity building, this at least needs to include: (i) purpose-built landscape delivery teams (including linkages to local councils); (ii) agricultural service groups and dedicated pastoralists and farmers in the region focused on ecosystem service delivery; and (iii) Traditional Owner groups, particularly building on the capacity of the Tagalaka, Ewamian and Kurtijar nations.

Long-term approaches to capacity investment and traditional owner nation building

At the foundation of all of these arrangements, it is essential that long-term, stable and cross-governmental effort is particularly focused on supporting the Tagalaka, Ewamian and Kurtijar people to build their preferred, well-governed nation building agenda, as detailed in their existing strategic and country-based plans (CLCAC 2021; Kurtijar People and CLCAC 2014; Ewamian Limited 2022; TAC 2020; 2021). There are, however, currently few cohesive, regionally-oriented support mechanisms for these efforts, despite the fact that they are essential to ensure that Traditional Owners are:

- well-placed and enabled to engage in regional dialogue about conceptual models of development within the catchment;
- genuine partners in any emerging science efforts within the catchment;
- in control of any efforts focused on the assessment, protection and management of cultural values within the catchment;
- supported to maximise social and economic benefit from any water development; and
- gearing up to provide significant landscape-scale management services.

In effect, this means long term and stable Federal and State support for supporting all three Aboriginal nations to develop their long-term governance and institutional capacities.

Building new knowledge in terrestrial, aquatic and marine condition and trend

Long-term science partnerships are also needed to inform any emerging evidence-based partnership frameworks and more detailed planning and delivery mechanisms. These longer-term partnerships, which build stable research and development capacity focused on the region, will be essential in overcoming the significant gaps in foundational state and trend knowledge sets. As mentioned through the analysis above, some of these key state and trend knowledge gaps include:

- Aquatic and marine ecosystems and their relationship to development pressures;
- Terrestrial biodiversity of importance to MNES;
- Cultural value within the landscape under the direction of Traditional Owner interests; and
- Agricultural and mineral development potential and agricultural productivity.

Long-term partnerships are also needed to mature the knowledge building process towards more sophisticated modelling, predictive and monitoring capacities, and the development of more engaged decision support tools to support trade-off analysis. Such approaches could be built upon the emerging new arrangements currently now operating through the CRCNA-funded Northern Australian Universities Alliance Water Security Program. This arrangement has the capacity to support the regional community with detailed science planning, enabling the involvement of a wider range of science institutions and disciplines, as well as commencing or fostering longer term thinking about more appropriate approaches to long term knowledge management in the region.

5 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 its 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 **Analysis Report** and through this **Solutions Report**, it is hoped that the progression of the identified steps above will enable 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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