

Department of ENVIRONMENT, PARKS AND
WATER SECURITY

Beetaloo Regional Reference Group Meeting

23rd March 2021



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Strategic Regional Environmental and Baseline Assessment (SREBA)

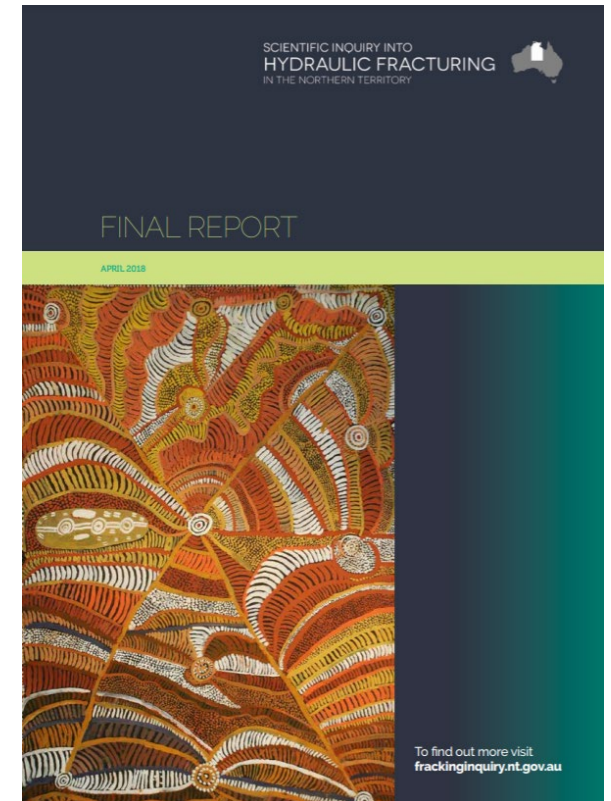


Why a SREBA?

In December 2016, the Northern Territory Government established the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory. The final report found that:

“... provided all of the recommendations made in this Report are adopted and implemented in their entirety, not only should the risks associated with an onshore shale gas industry be minimised to an acceptable level, in some cases they can be avoided altogether.”

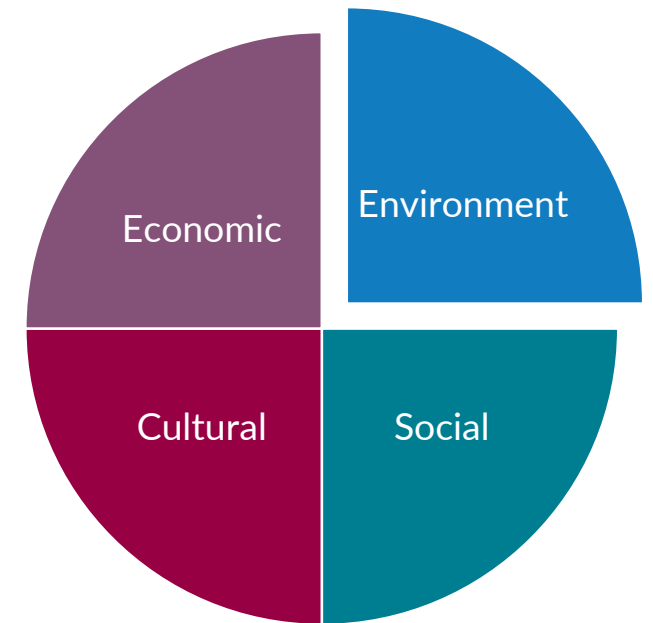
frackinginquiry.nt.gov.au



Why a SREBA?

In April 2018, the Northern Territory Government accepted all 135 recommendations of the Inquiry's Final Report and commenced their implementation. This includes Recommendation 15.1:

“That a strategic regional environmental and baseline assessment (SREBA) be undertaken prior to the granting of any further production approvals”



Purpose and application

The SREBA is a set of six studies to address knowledge gaps and establish appropriate baselines against which the potential impacts of proposed onshore gas activities may be assessed.



Role of the BRRG

BRRG members represent key stakeholders who live or have an interest in the SREBA region.

1. Key two way communication medium
2. Provide local guidance and feedback
3. Liaise with SREBA team members

Related projects

[GISERA – Impact assessment](#) CSIRO

Advice on impacts of gas development on industry, environment and communities.

[GBA – Bioregional Assessments](#) Australian Government

Geological and environmental baseline assessment that synthesises current knowledge.

[Mines and Energy, Department of Industry, Tourism and Trade, Northern Territory Government](#)

Responsible for regulating all non-environmental aspects of the petroleum industry.

Reporting and applications

Baseline reports within each domain

Use in development planning and regulation

Final SREBA report

Use in other natural resource management

Online information portal with datasets

Regional planning

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SREBA Engagement Strategy

Maddison Clonan



Why is engagement and consultation important for SREBA?

There are over 1400 people living in the SREBA study area. Many of these are “*affected stakeholders*”. Over 700 are Aboriginal and/or Torres Strait Islander people.

People play an important role in the SREBA study process.

The findings of SREBA will empower everyone to have a say about development and natural resource management in the study region.

Strategy objectives

Objective 1. Identify affected stakeholders and provide meaningful, appropriate engagement prior and throughout the project activities.

Objective 2. Create community and stakeholder awareness and understanding of the SREBA project, activities and findings.

Objective 3. Enable stakeholder and community involvement in SREBA and incorporate feedback into decision making.

Seeking your feedback

1. Who do you represent and how can I best engage or communicate about SREBA with them?
2. Would you like to provide input to the SREBA Engagement Strategy?
3. How can I best communicate with you?

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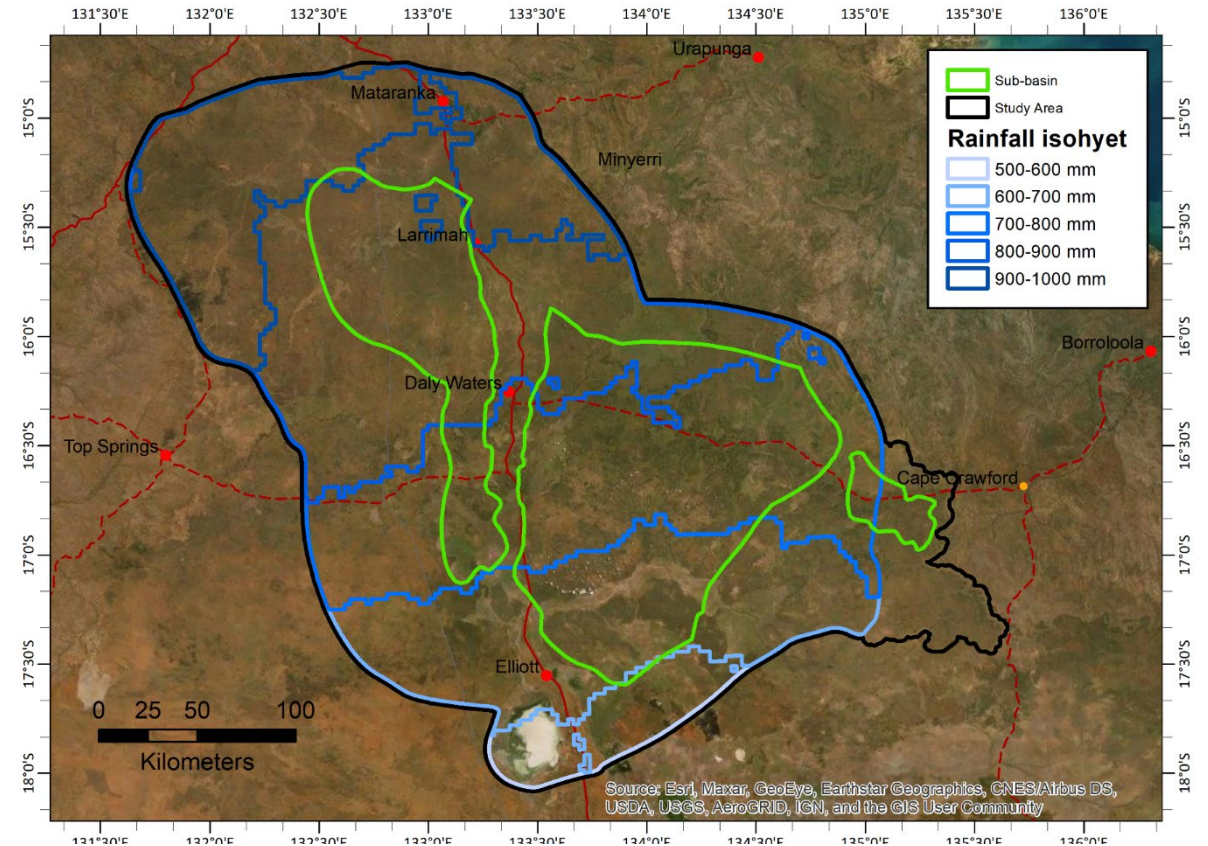
Beetaloo SREBA – Terrestrial Ecosystems

Lauren Young – Project Manager



Terrestrial Ecosystems

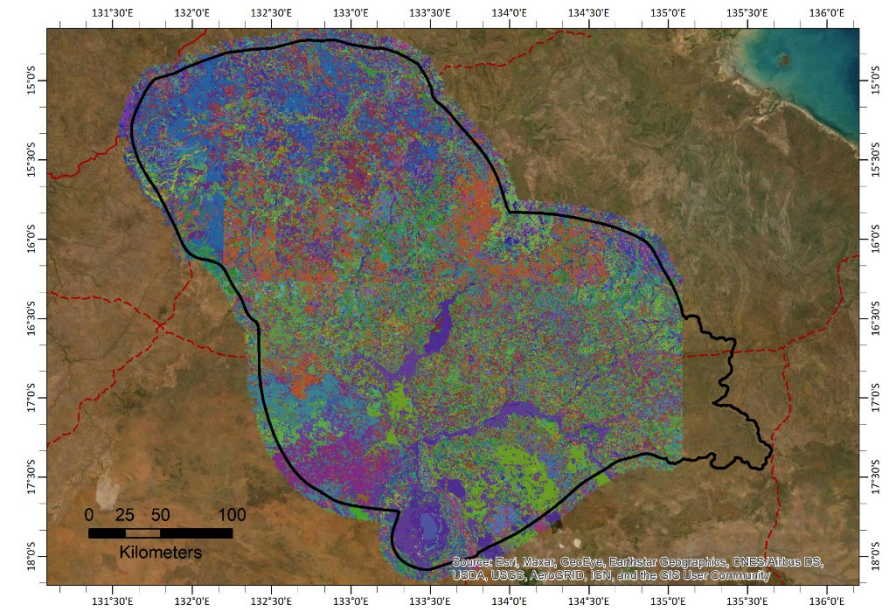
- Vegetation
- Fauna
 - Vertebrate
 - Invertebrate
- Environmental Values



GBA Project

Vegetation

- Preliminary Regional Ecosystems map (desktop)
- 46 Full floristic surveys
- 6,962 Rapid vegetation assessment sites
- Refinement of Regional Ecosystems map (ongoing)



Terrestrial Fauna

- 15 Camera-trapping sites – General fauna
- Targeted threatened species survey
 - Gouldian Finch
 - Crested Shrike-tit (Northern)
 - Greater Bilby

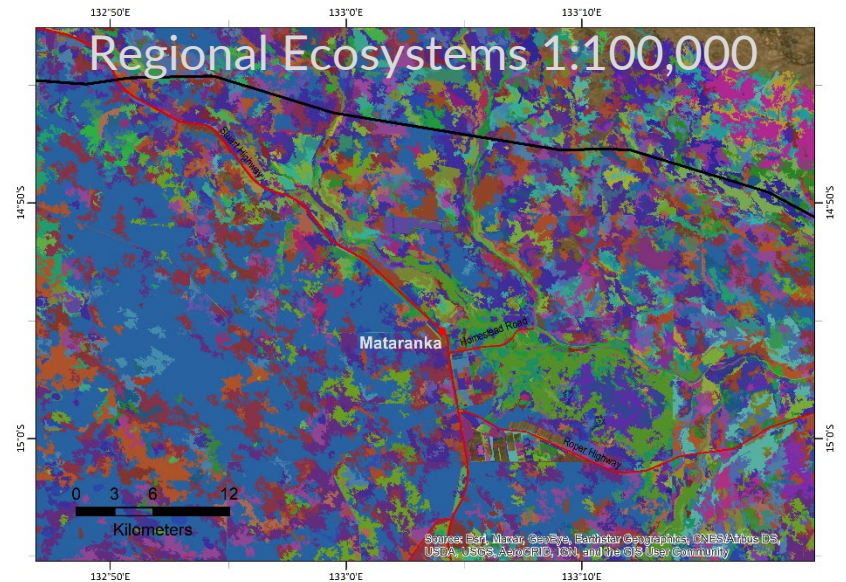
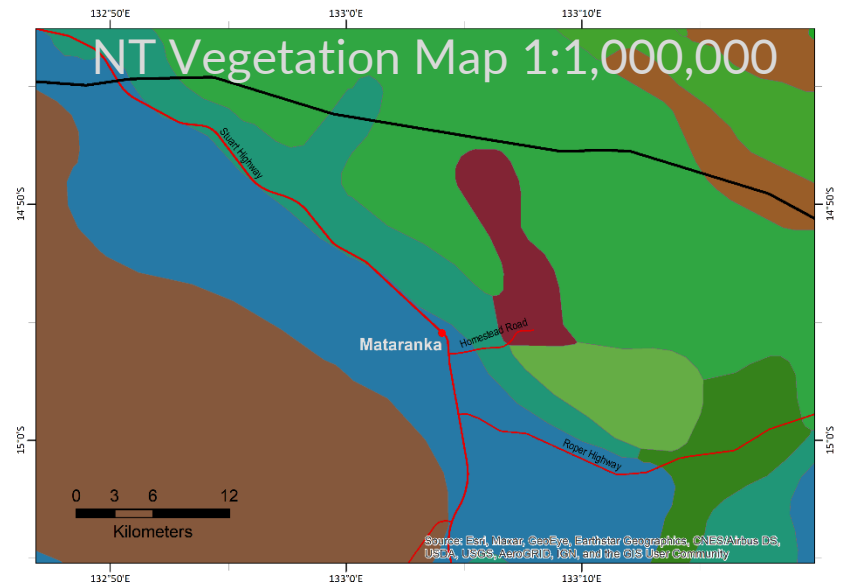
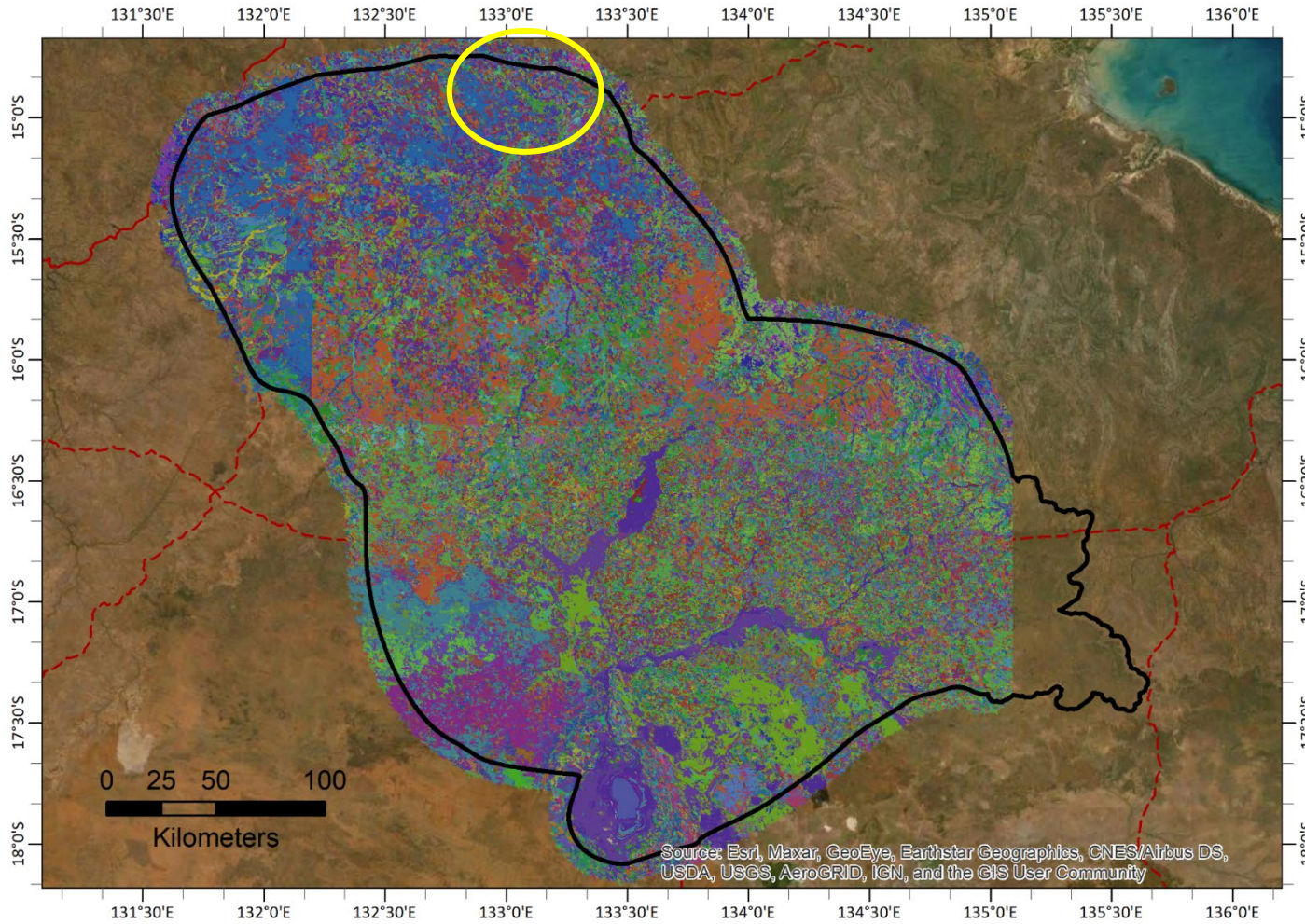


Vegetation

- **Baseline vegetation – 550 sites**
 - Five sites in each Regional Ecosystem
 - Vegetation structure
 - Landscape attributes
 - Full floristics – inventory of species
- No threatened species identified at this stage
- Rapid vegetation assessment - opportunistic
- Continuing refinement of Regional Ecosystems map



Regional Ecosystems Map



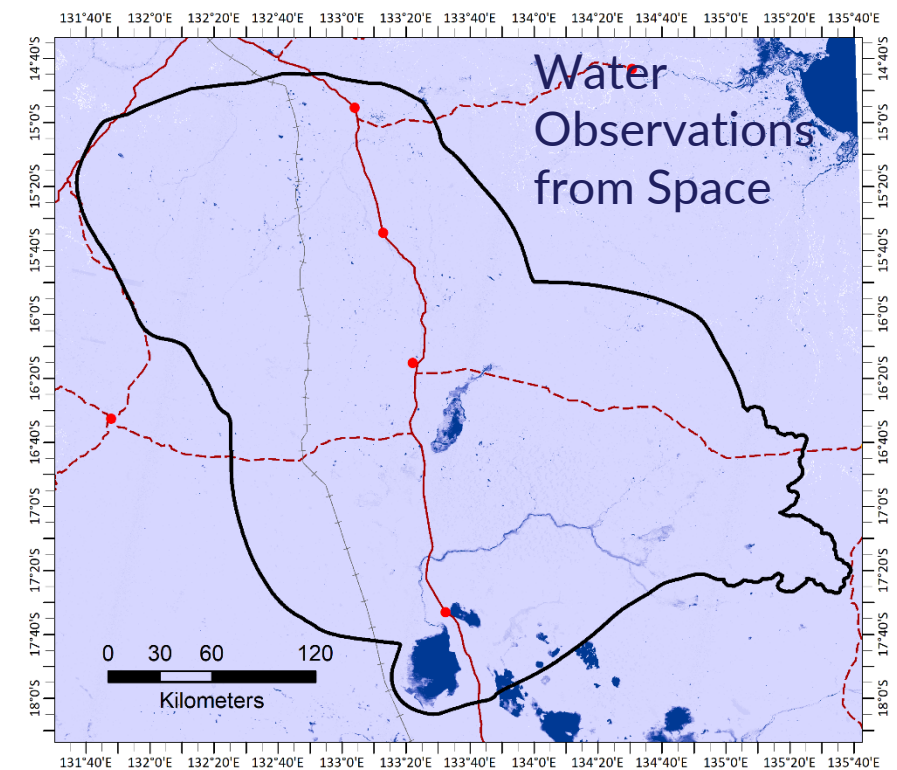
Terrestrial Fauna

- **Baseline – vertebrate and invertebrate – 120 sites**
 - Five sites in each aggregated habitat type
 - Live-trapping
 - Motion-detecting cameras
 - Acoustic recorders – bats
 - Bird surveys
 - Nocturnal searches
 - Invertebrate traps
- **Threatened species**
 - Targeted threatened species
 - Crested Shrike-tit (Northern), Greater Bilby, Gouldian Finch, Ghost Bat
 - Non-targeted threatened species
 - Red Goshawk, Grey Falcon, Painted Honeyeater, Partridge Pigeon, Princess Parrot, Merten’s Water Monitor, Mitchell’s Water Monitor, Plains Death Adder, Yellow-spotted Monitor



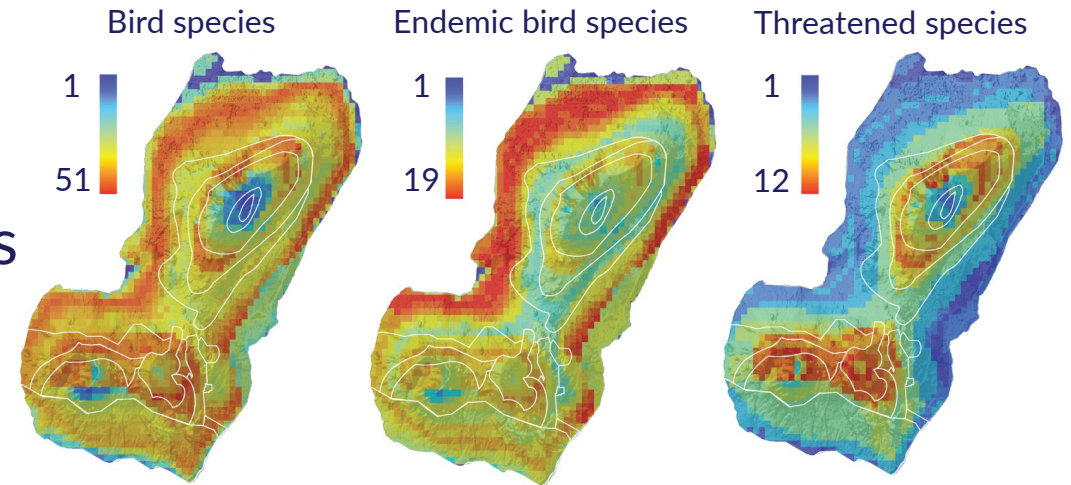
Waterbirds

- **Waterbirds**
 - Waterbird communities
 - Resident
 - Nomadic
 - Migratory (listed and non-listed)
 - Threatened species
 - Australian Painted Snipe, Curlew Sandpiper



Environmental Values

- Areas of high conservation value
 - Concentration of threatened species
 - Concentration of endemic species
 - Wildlife aggregations
 - Botanical significance
- Sensitivity of significant species
 - Dependent on large areas of continuous vegetation
 - Habitat specialists/regionally restricted distributions
 - Significant overlap between core habitat and potential development footprint



E.g. Zafra-Calvo et al. 2010, Brazilian Journal of Nature Conservation, 8 27-33

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Introduction to SREBA Aquatic Biodiversity Studies

Peter Dostine/Flora and Fauna Division



SREBA Aquatic studies

Aquatic biota

Taxon group	Work undertaken by
Plants	Flora and Fauna, MAGNT, Fisheries
Fish	Flora and Fauna, MAGNT, Fisheries
Freshwater turtles	Flora and Fauna, MAGNT, Fisheries
Macroinvertebrates	Flora and Fauna, MAGNT, Fisheries
Zooplankton	Flora and Fauna, MAGNT, Fisheries

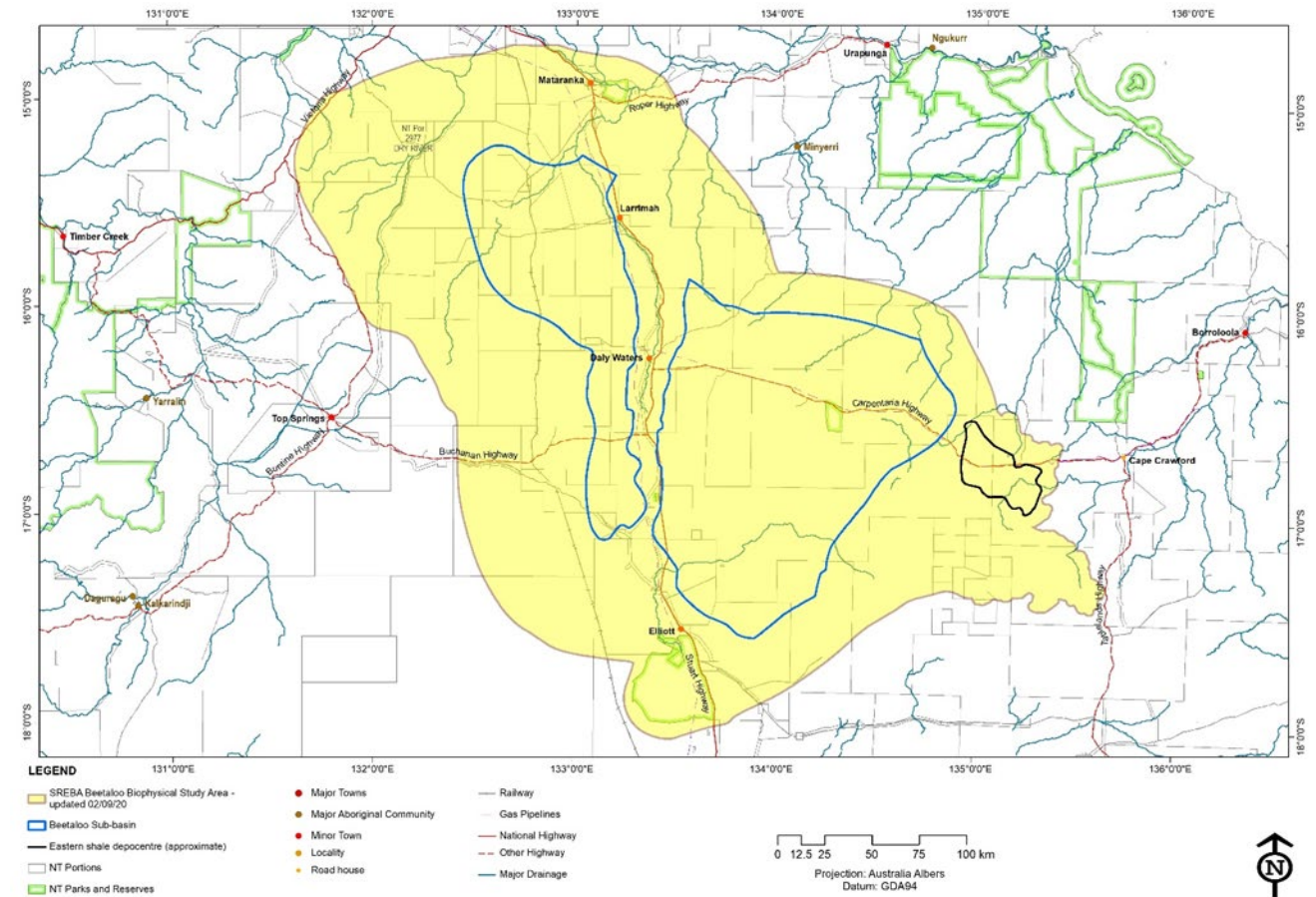
SREBA Aquatic studies

- General comprehensive survey May to August 2021
- Targeted survey for threatened species late 2021
- Quarterly sampling of selected sites
- Repeat sampling or additional sites 2022

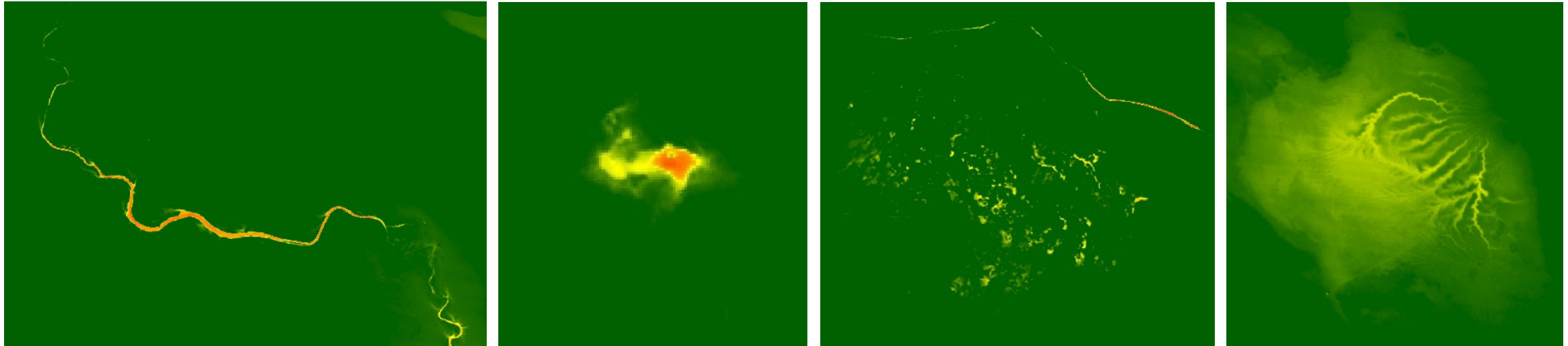
SREBA Aquatic studies

- 80,000 km²
- 4 river drainages
- Region poorly surveyed
- Target 100 sites

Study area



SREBA Aquatic studies *Habitat mapping and classification*



- Sites selected to include range of different habitat types in different catchments
- River channels, floodplain billabongs, shallow swamps, springs
- Sampleable sites identified from remote sensing of water in the landscape in dry season

SREBA Aquatic studies

Aquatic biota: macroinvertebrates



Order	# NT species
COLEOPTERA	210
EPHEMEROPTERA	29
HEMIPTERA	68
ODONATA	109
TRICHOPTERA	157
	573

- “Macroinvertebrates’ includes familiar animals like mussels and crayfish
- Several orders of aquatic insects, molluscs, crustacea, mite and worms
- Potentially 100s of species

SREBA Aquatic studies

Aquatic biota: fish



Glassfish



Chequered rainbowfish



Fly-specked hardyhead

- Estimated 53 species fish in SREBA area
- Focus on taxonomic problem species or species with genetically distinct populations

SREBA Aquatic studies

Aquatic biota: turtles



- 5 or 6 freshwater turtles in region
- Gulf Snapping Turtle Endangered under Commonwealth EPBCA
- Targeted surveys for Gulf Snapping Turtle and Freshwater Sawfish

SREBA Aquatic studies

Sampling methods for aquatic biota



Back-pack electro-fishing



Boat-based electro-fishing



Fyke net

SREBA Aquatic studies

Sampling methods for aquatic biota



- Aquatic biodiversity inventory
- Spatial patterns of diversity
- Identification of High Ecological Value Aquatic Ecosystems
- Identification of sensitive species and habitats

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SREBA Water Quantity and Quality Scope of Work

Michael Short, Senior Hydrogeologist
Water Resources Division



Water Quantity and Quality: Scope

In draft stage, divided into seven sub-projects

- Project 1: Identification of knowledge gaps
- Project 2: Baseline water level and water quality monitoring
- Project 3: Inter- and intra-aquifer connectivity
- Project 4: Surface water/groundwater interactions and recharge
- Project 5: Numerical model update
- Project 6: Surface water flow characterisation and mapping
- Project 7: Summary report

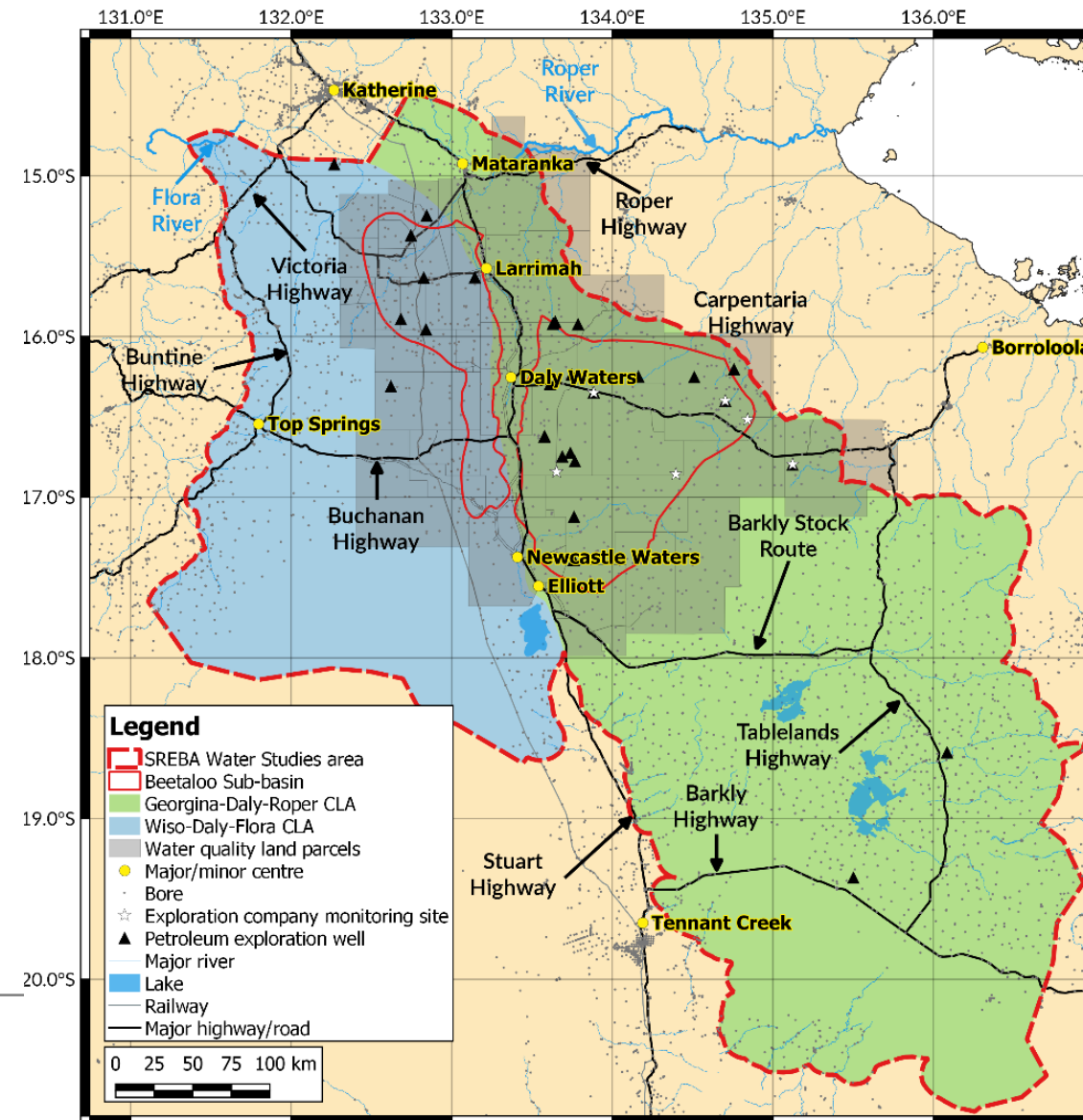
Project 1: Identification of knowledge gaps

- Assessment and report completed in late-2020
- Literature review of recent and historic studies
- Current level of knowledge for water balance components
- Describes types of studies that could be undertaken to address key knowledge gaps
- Prioritizes specific studies for completion during SREBA

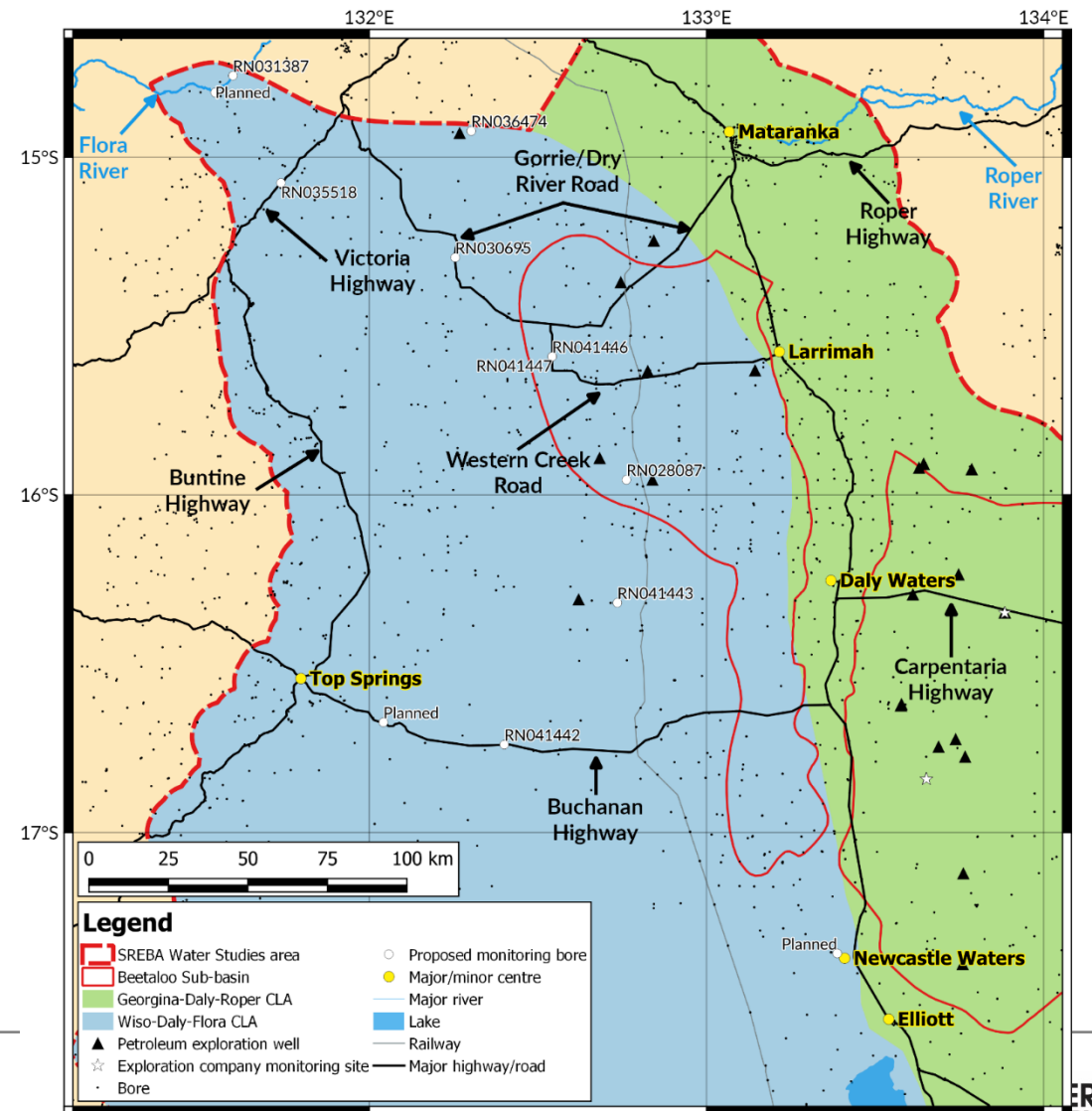
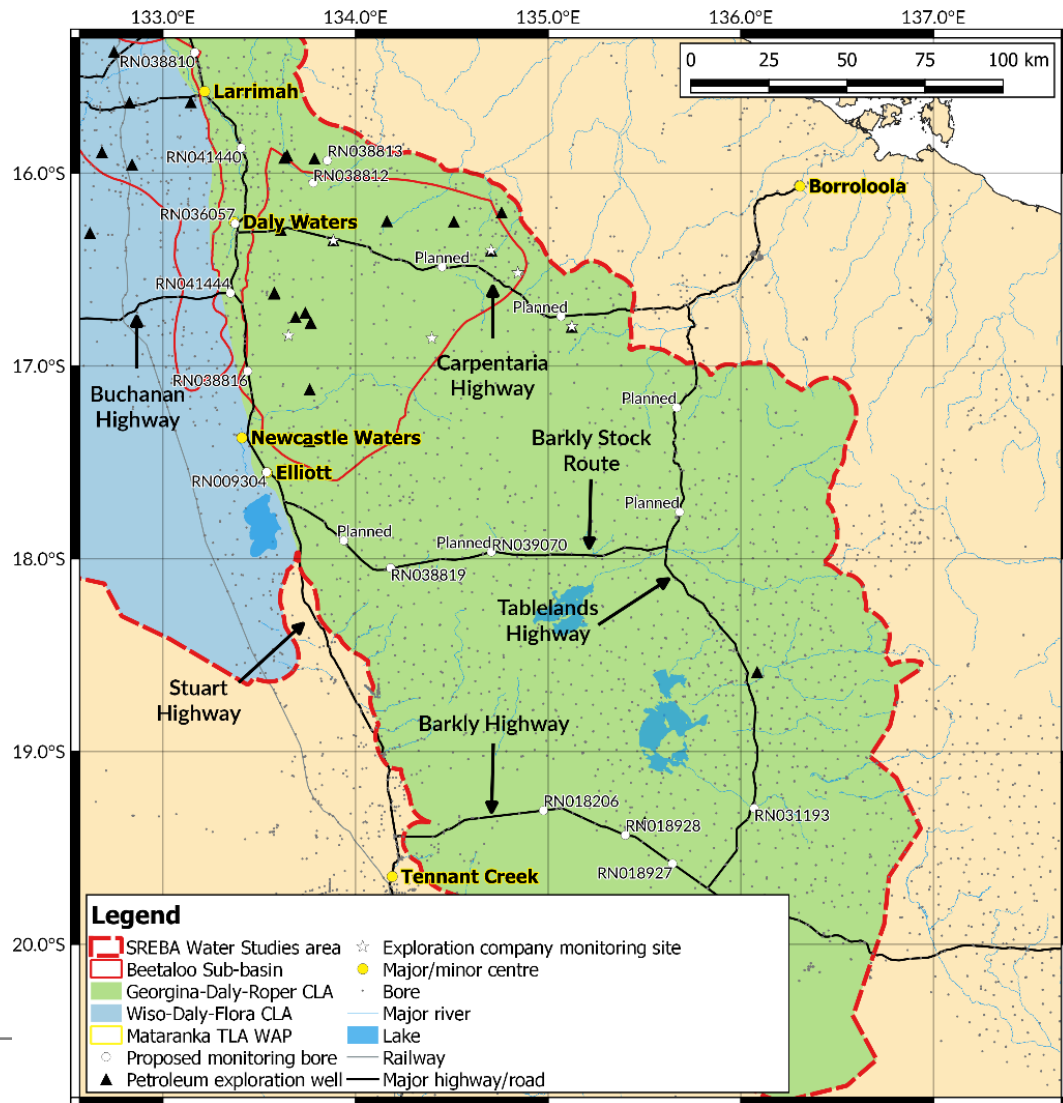
Project 2: Baseline monitoring

- Draft monitoring plan completed in early-2021
 - To be amended based on engagement with NTG and community stakeholders who will be able to assist with the monitoring networks
- Monitoring work to be completed by Water Resources Division personnel and data made available on the online Water Data Portal
- Water level baseline obtained from a network of existing and planned Water Resources Division monitoring bores
 - Barkly Highway to Mataranka Springs
 - Buchanan Highway to Flora River/Djarrung
- Water quality baseline to be obtained via existing-users – Power & Water borefields, Aboriginal land trust domestic bores and pastoral bores
 - Focused in the area of potential gas production and primary discharge areas (Flora and Roper)

Water quality monitoring



Water level monitoring



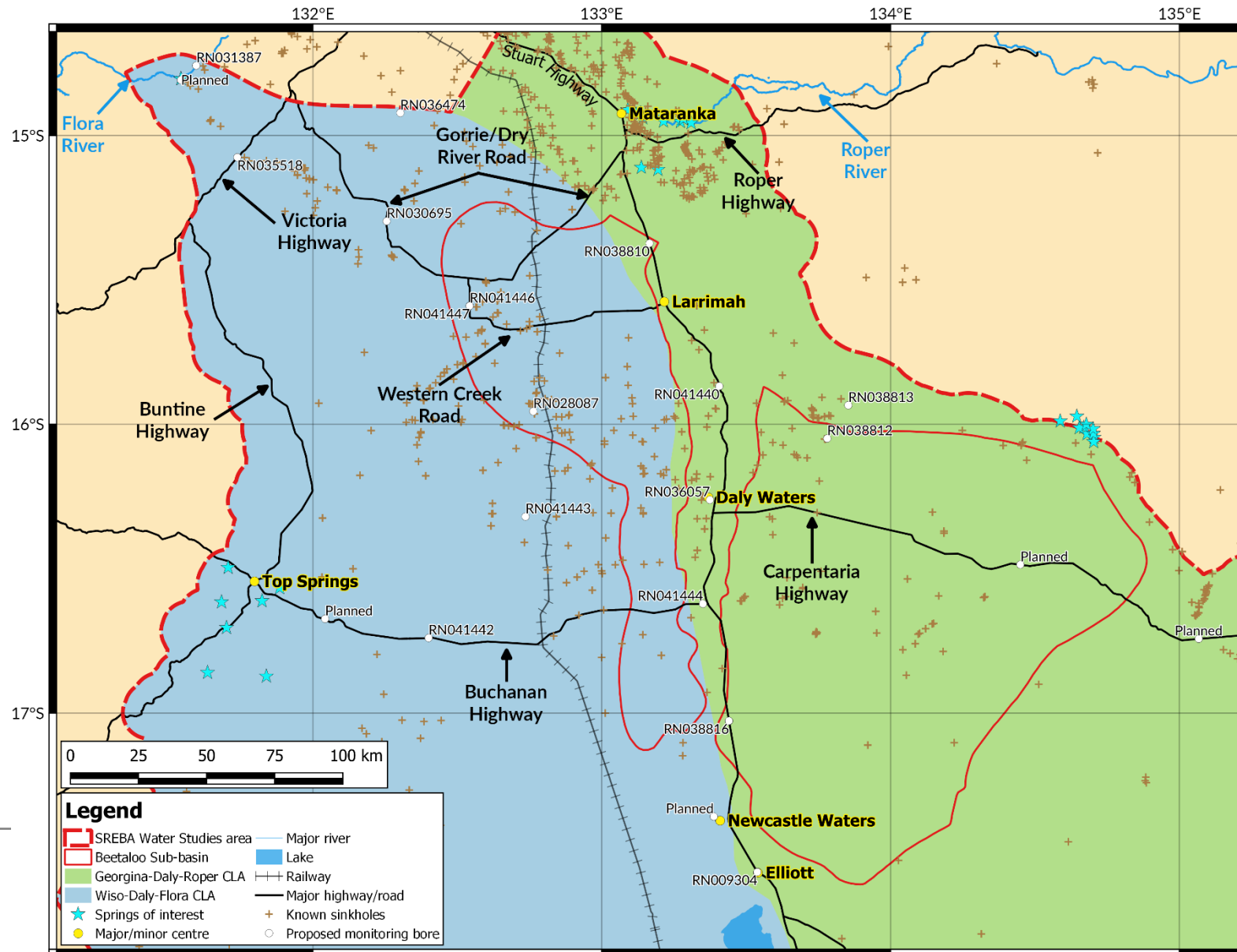
Project 3: Inter- and intra-aquifer connectivity

- Compile and analyse historic pump test data to establish known ranges for aquifer parameters
- Identify existing bores for aquifer testing
- Install new groundwater bores to address data gaps identified
- Compile and review findings from existing environmental tracer studies
- Summarise the current the state of understanding of the inter- and intra-connectivity of the region's primary aquifers

Project 4: SW/GW interactions and recharge

- Review and compile historic data and studies
- Install new monitoring infrastructure (bores and/or stream gauges) in areas of interest (near sinkholes, rivers and inferred recharge zones)
- Undertake a baseline survey of the Flora River spring complex near Djarrung (CDU researchers will be leading this study)
- Undertake field surveys of minor spring clusters near Top Springs and northern Tanumbirini Station
- Identify sinkhole clusters to target for potential monitoring

Sinkholes and springs



Project 5: Numerical model update

- Review existing model for deficiencies
- Incorporate conceptual understanding from Projects 2-4
- Update calibration datasets
- Extract natural water balance information
- Recommend monitoring deficiencies and priority datasets to improve model performance

Project 6: Surface water flow characterisation and mapping

- Hydrological models of the surface water catchments overlying the Beetaloo Sub-basin.
- Hydraulic models for Lake Woods, Lake Tarrabool and Lake Sylvester including northern drainage systems
- Report on model development, incorporating a description of the current understanding of the surface water systems overlying the Beetaloo Sub-basin
- Undertake flood/inundation mapping where possible (may be limited by topographic data accuracy)
- Assessment of risks to surface water/wetlands, groundwater recharge zones and sites of conservation significance
- Define the ongoing monitoring program for further assessment of surface water resources

Project 7: Summary report

- To be completed by end of December 2022
- Define the current conceptual understanding of primary water cycle components for the Beetaloo
- Produce spatial files for public use
- Define water quantity and quality triggers
- Recommend ongoing monitoring requirements