Gulf Savannah

Northern Australia

Gilbert River Irrigation Area

Investment Report
April 2009

GULF SAVANNAH DEVELOPMENT

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(Available from Gulf Savannah Development)

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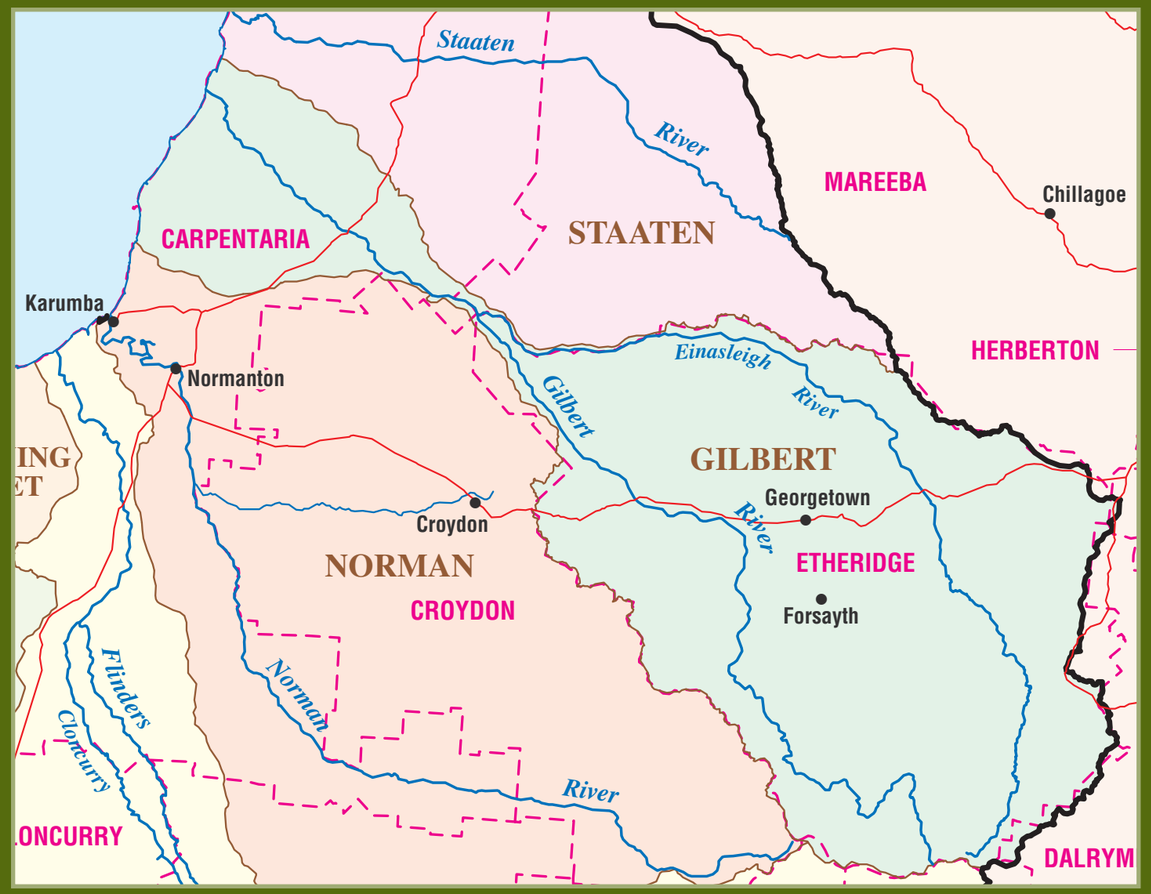


1. Executive Summary

The Gilbert River in the Gulf Savannah region of northern Queensland has long been identified as having the potential to develop an irrigated agriculture industry. Serious investigations in this regard were undertaken by the Queensland Government from 1998 to 2000, resulting in a proposal to establish 'Green Hills' dam. Further investigations have recently been undertaken into the irrigation potential of the region, driven by recent private sector expressions of interest, and its significance as a nation-building and regional development initiative.

The purpose of this report is to provide a balanced summary of the potential of the Gilbert River and to facilitate Government and private sector investment in the irrigated agriculture opportunities.

A recent *Scoping Brief on the Proposed Gilbert River Agricultural Precinct* examined a production scenario which assumed a dam of 300,000 ML capacity and 100,000 ML annual yield, and principal crops of rice and peanuts. These crops were selected partly based on investment interest. Under this scenario, 100,000 ML of water would be sufficient to irrigate 13,800 ha of land, with a gross annual revenue of $68.8 million and a gross margin per hectare of $830.61. This compares favourably with gross margin projections prepared for the recent expansion of the Ord irrigation area in Western Australia.

Under this scenario, opportunities to also value add to the region's beef cattle industry have been identified. In addition an estimated $19.2 million of total variable input costs would be expended within the region, to support and grow local business.

The *Scoping Brief* identified other crops which could be grown in the area but for which further market and production analysis would be required. The option of establishing an organic precinct is also identified, given the significant comparative advantages for organic production that are offered by the region.

Soil assessments undertaken at a 1:100 000 scale have identified 20,984 ha of land that is highly suitable for irrigated agriculture and a further 7,580 hectares that is moderately suitable. Given that the soil assessments only covered 108,000 ha, further soil assessments may identify additional land suitable for irrigated agriculture, allowing for an expansion of the irrigation area.

Numerous indicators point to ongoing socio-economic disadvantage in Gulf Savannah Shires, including for the Gulf's majority indigenous population. Social impact assessments undertaken in 2000 identified broad local community support for the irrigation area, although some concerns exist over compulsory acquisition of land.

An annual water take-off of around 200,000 ML for Green Hills dam would represent about 4.5% of the Gilbert River's annual discharge. A statement of environmental values prepared for this report indicates potential concerns regarding downstream impacts and puts a case for further research into the region's environmental values.

A dam of around 300,000 ML capacity is thought to cost approximately $200 million. A range of supporting investments have also been identified to enhance the profitability of the area, to facilitate private sector investment and to deliver broad regional development outcomes.

A range of compelling competitive advantages exist for establishment of the Gilbert River irrigation area and a strong alignment with national policy objectives has been identified.

This report also reaffirms the commitment of Gulf Savannah Development and Etheridge Shire Council to sustainable economic development and to ongoing discussions with both levels of Government, including seeking funds for the additional research required to progress the project. The report also provides contact points for private sector investment interest.

2. Introduction

The Gilbert River in the Gulf Savannah region of northern Queensland has long been identified as having the potential to develop an irrigated agriculture industry.

Serious investigations in this regard were undertaken by the Queensland Government from 1998 to 2000, resulting in a proposal to establish 'Green Hills' dam, named after a property on the Gilbert River. In 2008, Etheridge Shire Council sought further investigations into the irrigation potential of the region, based on its perceived significance as a nation-building initiative and as a driver for regional development. A mutli-disciplinary team was convened in early 2009 to look at a range of issues and this report is an output of their work. The purpose of this report is to provide a balanced summary of the potential of the Gilbert River and to facilitate Government and private sector investment in the irrigated agriculture opportunities.

The drivers for this renewed interest in the Gilbert River include:

- the need to address the ongoing socio-economic disadvantage experienced in Etheridge Shire and other parts of the Gulf Savannah region
- recent interest from private sector interests to invest in irrigated agriculture along the Gilbert River
- three quarters of Australia's current irrigated land area is occurring in catchments nominated as "high" or "very high" risk. In the irrigation regions of the Murray-Darling Basin, north-eastern New South Wales and south-eastern Queensland, multiple factors interact to threaten water resources, including significant development of surface and groundwater resources and recent declines in rainfall in recent decades[1]
- climate change projections forecast further decreases in rainfall for those parts of Australia where irrigated agriculture is currently based, and potential increases in rainfall across Australia's northern savannahs[2]
- global demand for food, and both national and global food security concerns, are driving a push for increased food production
- global and national concerns about fuel security and the need to develop alternatives to fossil fuels, are driving a push for planting of crops to provide ethanol and biofuels.

2020 Summit: Closing Speeches

"...we need to chase the water in the north..... and be part of a global response to the world food shortages..."

Tim Fischer and Tony Burke

3. History

The potential of the Gilbert River was recognised from the early days of European settlement, when market gardens were developed around the Gilbert River to feed the large mining population. Formal investigations of the irrigation potential of the Gilbert River commenced in 1997, through the State Government's Water Infrastructure Task Force. The Task Force evaluated water supply proposals from across the State and recommended a Gulf Region Study be undertaken to identify priorities for water resource development within the region and to confirm the feasibility of individual proposed projects. The Gulf Region Study was identified as a Category 1 (highest priority) project[3].

In 1998, the Department of Natural Resources produced the report *Engineering Assessment of Storage Options* in partial response to the Task Force's recommendation. This report identified eleven possible storage development options in the Gulf, mostly located in Etheridge Shire, which were "selected on the basis of ability to serve potentially irrigable land[4]". One of the options was the North Head dam on the Gilbert River, and associated weirs downstream at Green Hills and Prestwood.

All eleven possible storage options were then subjected to further investigations by the State. The North Head dam was rejected (for several reasons) in favour of a dam at one of two sites on Green Hills station, one costing approximately $30 million and the other approximately $33 million (costings in 1999 dollars). The recommended option was for a dam wall height of 20 metres which would submerge 2,767 ha, and store 131,000 ML, sufficient to irrigate around 7,500 ha. A downstream regulating weir was also proposed at a cost around $4 million. The storage curves for the preferred Green Hills site included an option for a dam wall height of 35.4 metres, which would submerge 12,739 ha and store up to 1,320,000 ML, sufficient to irrigate over 65,000 ha. It seems the recommended size of the dam was indexed to perceptions that land with soils suitable for irrigation was limited to 7,500 ha. It is now known that the available soil is far in excess of 7,500 ha.

The State also prepared a *Social Issues Report* in 2000[5], which identified social issues that required further consideration and analysis (principal issues were compulsory resumption of land, environmental impacts and labour supply).

Allocation and use of water in the Gulf Savannah is governed by the Gulf Water Resource Plan, which took effect in 2007, and the associated Gulf Resource Operations Plan. When the State began planning for the Gulf Water Resource Plan in 2003, it ruled out development of the Green Hills dam from the outset: "water to accommodate Green Hills Dam will not be accommodated during the life of this Plan due to the lack of an identified economically and ecologically sustainable use. However its viability may be reconsidered through a trigger mechanism if certain criteria are met[6]".

This exclusion was made notwithstanding the extensive planning undertaken by the State up to 2000, and the findings of the 2006 land and water resource assessment (which accompanied the Gulf Water Resource Plan) that the potential Green Hills Dam on the Gilbert was "considered worthy of further investigation" and would allow a "substantial irrigation development[7]".

The State's own evaluation of the Gulf Water Resource Plan process (2008) has found that the planning framework was not appropriate for the Gulf, and reinforces current stakeholder concerns about the Plan: "the water planning framework had been developed to correct the legacy of over-allocated systems and state investment in water resources. In the Gulf, where there has been limited cultivation of water resources... the application of the framework was not as appropriate...[8]."

This report indicates that an economically and ecologically sustainable use of water from Green Hills dam may now exist, based on a gross margin analysis prepared by the Department of Employment, Economic Development and Innovation (DEEDI) in 2009, and expressions of interest received from a number of large agricultural production companies. As such, this could trigger reconsideration of Green Hills dam under the Gulf Water Resource Plan.

A 50-year Regional Water Supply Strategy for North-West Queensland, currently being prepared for the Department of Environment and Resource Management (DERM), is also examining the demand factors underpinning potential growth of irrigated agriculture in the region.

4. Economic Opportunities

As part of the research undertaken for this report, the Queensland Department of Employment, Economic Development and Innovation (DEEDI) prepared a *Scoping Brief on the Proposed Gilbert River Agricultural Precinct* which included a market analysis and gross margin analysis[9].

The *Scoping Brief* is based on an assumption generated from the Department of Environment and Resource Management (DERM), for a dam of 300,000ML capacity that would yield an average annual yield of 100,000ML. An economic assessment of a dam with a larger storage capacity was not included within the *Scoping Brief*.

The current principal land use in the Gulf region is grazing of beef cattle. There is a small number of cropping developments occurring within the Etheridge Shire (Table 1). These enterprises principally draw upon Gilbert River water.

Table 1: Current Cropping Activity: Etheridge Shire[10]

Crop type	Approx area (ha)	Notes
Mangoes	150 ha	Two major enterprises
Peanuts	70-150 ha	One major enterprise
Broad acre cropping	70-150 ha	Two major enterprises
Hay based crops	150-200 ha	3-5 major enterprises

The *Scoping Brief* looks at three production scenarios:

1. Selected Cropping Options: this scenario looks at crops which are currently grown and crops which required limited market investigation. Under this scenario the principal crops selected were mangos, peanuts, rice, maize, soybeans, mung bean, melons, pumpkins, fodder crops and a cattle/silage production system. The selection of these crops was supported by expressions of interest received from several large agricultural production companies. This scenario is thus based on a generalised enterprise cropping mix reflecting production risk strategies, climatic conditions and current market opportunities

2. Potential Cropping Options: this scenario looks at crops which can be grown in the region but which need further market and production analysis

3. Cropping Alternatives: this scenario looks at longer term potential cropping and industry alternatives which require in-depth analysis but could have long term economic, social and environmental benefits.

Selected Cropping Options:
Under this scenario, the *Scoping Brief* found that at least two major crops (peanuts and rice) and doubling of the mango production would be required to gain an infrastructural critical mass for this agricultural precinct. This would also be in conjunction with a range of small cropping options. It would appear that this type of cropping mix and production area is required to limit production failure, market distortions and maximise the efficient use of land and water infrastructure.

The findings are summarised in Table 2 and assume the principal crops being rice and peanuts (3000 ha each) plus maize and sorghum. Under this scenario, 100,000 ML of water would be sufficient to irrigate 13,800 ha of land, with a gross annual revenue of $68.8 million.

Table 2: Selected Cropping Options: Snap Shot of the Gilbert River Agricultural Precinct[11]

Total Area Under Major Production (ha)	13,800
Total Gross revenue - farm gate ($)	$68,821,671
Total Variable input costs ($) - *adjusted to cropping only*	$53,258,682
Gross Margin ($) - *adjusted to cropping only*	$11,462,390
Gross Margin per hectare ($) - *adjusted to cropping only*	$830.61
Total Irrigation Water Used (ML)	95,550
Average Irrigation used per hectare (ML/ha)	6.74
Selected production transported outside the region (Tons) - *mangoes, peanuts, rice, sorghum, soybeans, navy beans melons, pumpkins, hay*	104,613

Table 2 also shows that a gross margin per hectare of $830.61 is projected by the Scoping Brief. This compares favourably with gross margin projections prepared for the recent expansion of the Ord irrigation area in Western Australia (Table 3 refers). The estimate of costs in the *Scoping Brief* includes costs of water usage, drawing upon rates paid in comparative irrigation areas in North Queensland, but not the costs of buying water allocations.

Table 3: Gross Margin projections: Ord Expansion WA[12]

Crop Type	Estimate gross margins per hectare per annum
Fodder crops (leucaena and hay)	$1,000 to $1,300
Broad-acre, niche-market crops (hybrid seed, chick peas, grain sorghum	$200 to $1,700
Broad-acre crops (sugar and cotton)	$200 to $1,000
Horticulture (melons and pumpkins)	$1,400 to $1,600
Tree crops (sandalwood, mangoes, citrus)	$1,300 to $2,000

As noted earlier, beef cattle grazing is the main land use in the region. It is anticipated that in future the industry will seek to value add through irrigated pasture and production of irrigated fodder crops. This would allow fattening of stock within the region and would facilitate application of improved animal husbandry practices such as stock segregation. Crops and their by-products (such as peanut hay) could be used within these grazing management systems. Increased fattening within the region may make development of an abattoir in the Gulf region commercially viable, greatly adding to the value of the beef cattle industry and improving Australia's competitiveness in the Asian beef export market.

Potential Cropping Options: the *Scoping Brief* also identifies a range of other crops that could be grown in the region, including cotton, bananas, cashews, citrus, and horticultural crops. Some of these are higher value crops than those included under the selected cropping scenario. However further market and production analysis would be required to assess whether these crops are commercially viable in the region and to assess their impacts on the gross margins presented under scenario one.

Cropping Alternatives: the *Scoping Brief* also highlights possible industry and production alternatives such as an organic precinct, aquaculture, forestry and bio energy options for the proposed precinct. However in-depth analysis and research would again be required to evaluate these opportunities.

An organic precinct would open up opportunities for a range of crops which currently have limited market access due to over production and potentially open up new markets both locally and overseas. Advice from the DEEDI Trade and Investment Officer (Primary Industry & Fisheries) has suggested that there is a large export market opportunity for organic grains in Asia and Arabic states which currently cannot be met.

The Gilbert River region is considered to have important comparative advantages for organic production:

- the dry climate means reduced disease, insect and fungal threats. Current producers have reported, for example, that the region has a reduced reliance on herbicides and insecticides as against coastal locations
- as a region which has not been extensively cropped before, this creates a distinctive opportunity for any new agricultural precinct as it could be developed from a base concept where all controls and accreditation would be in place prior to any type of cropping development occurring.

An organic precinct would be perceived as having environmental benefits which could potentially create fewer issues from a planning prospective. This type of precinct would be marketed as a total organic precinct similar to the King Island concept offering special brand recognition in the market and thus potentially attracting a price premium.

This type of concept would be unique within the tropics and offer attributes such as a stand alone tourism destination and possibly create food processing opportunities for the region.

Secondary Benefits
Based on current expenditure patterns[13], an estimated $19.2 million of the identified total variable input costs for the Gilbert River irrigation area would remain in the local economy annually. However, it is considered that the irrigation area would facilitate establishment and growth of local business within the Gulf Savannah and that the amount of expenditure in the local economy would increase beyond this figure over time. A large agricultural supplies company is already proposing to establish an outlet in Georgetown, for example. Unemployment rates in Gulf Savannah Shires (Etheridge – 5.8%; Croydon – 5.5%; Carpentaria 5.5%[14]) would also be expected to decrease.

Summary						Harvesting Seasonality											
Agricultural Activity	Area (ha)	Total Water Used (ML)		Volume Sold	Farm Gate Gross Rev ($)	January	February	March	April	May	June	July	August	September	October	November	December
Cattle Stores (silage)	-	2,500	Head	6,199	4,100,599												
Fodder**	800	2,800	Tonnes	6,000	1,000,000												
Pumpkins**	500	2,500	Tonnes	9,000	6,750,000												
Peanuts**	3,000	28,000	Tonnes	21,000	12,150,000												
Mangoes	300	2,700	Tonnes	3,234	8,061,900												
Maize**	2,500	15,000	Tonnes	20,500	6,150,000												
Mung Beans**	500	2,000	Tonnes	800	586,672												
Navy Beans**	500	2,500	Tonnes	1,100	990,000												
Rock/honeydew Melons**	200	800	Tonnes	8,929	7,905,000												
Rice**	3,000	25,500	Tonnes	21,000	9,450,000												
Sorghum**	1,500	6,000	Tonnes	9,300	2,790,000												
Soybeans**	500	2,750	Tonnes	1,250	687,500												
Watermelons**	500	2,000	Tonnes	10,000	8,200,000												
	13,800	95,550			68,821,671	*Note **area double cropped in a 12-18 month cropping cycle*											

5. Soils

A separate response to the State Water Infrastructure Task Force's 1997 report was *An Assessment of Agricultural Potential of Soils in the Gulf Region* (1999), prepared by the former Queensland Department of Natural Resources[15]. This assessment was undertaken at a broad reconnaissance scale (1:1 000 000) and found that the Gilbert River basin had soils with Class 1 suitability for tree crops, banana, row crops, field crops, peanuts, and sugar.

Subsequent detailed soil mapping at a 1:100 000 scale was undertaken by the Department of Natural Resources over a section of the Gilbert River between Chadshunt Station and Green Hills Station[16]. This is the most detailed mapping available over the Gilbert River catchment. Of the approximately 108,000 hectares of land mapped, 20,984.2 hectares was identified as arable land that is highly suitable for irrigated agriculture with negligible to minor limitations, and another 7580.3 hectares was identified as arable land that is moderately suitable for irrigated agriculture with moderate limitations.

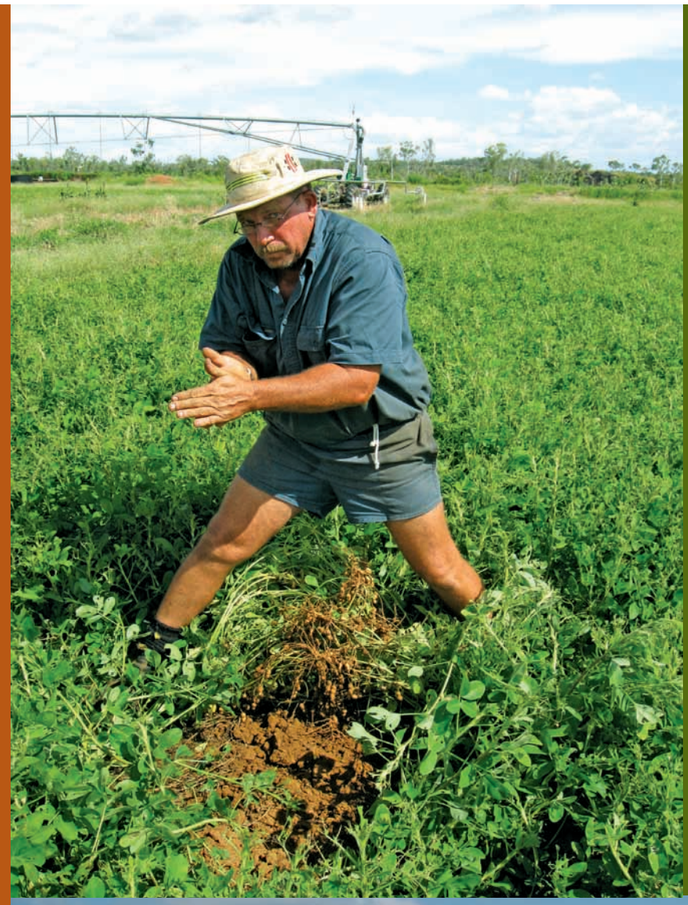
For the 20,984.2 hectares identified as arable land that is highly suitable for irrigated agriculture, the soils are typically deep to very deep, well drained on level to gently undulating and undulating plans and rises. The mapping identified that the most limiting attributes would be soil moisture holding capacity/moisture availability on the sandier soils, erosion potential on sloping soils, and low fertility on soils other than the recent alluvials. The study said that the "land has the potential for the sustainable production of a wide range of irrigated land uses climatically suited to the area, with the lowest risks of degradation. Management inputs will be no more than typical best practice for irrigated land management".

For the 7580.3 hectares identified as arable land that is moderately suitable for irrigated agriculture, these are lands with soils that have a measurably lower potential than the highly suited lands described above due to moderate limitations. Soils and landscapes are superficially similar but the severity of limitations may result from either, or a combination of, a lower moisture availability, low fertility, poorer landscape drainage and lower permeability, moderate soil depth, sodicity, higher erosion potential and steeper slopes.

Many soils, due to their landscape position being lower elevated than the above soils, receive soil moisture from elevated areas in excess of normal rainfall inputs during the wet season that will create short-term waterlogging and drainage problems. The effect of the limitations encountered will necessitate a greater level of management input to prevent degradation and maintain production.

In addition to the highly suitable and moderately suitable soils, the study also found 14460.0ha of limited arable land - arable land that has quite pronounced limited irrigated agricultural potential due to moderate and largely severe limitations. 64834.4ha of the 108,000 ha surveyed was classified as unsuitable land.

Drawing upon this research, a 2004 report prepared for the Gulf Water Resource Plan concluded that "the Gilbert River … alluvial soils appear to be suited to irrigated agriculture … and have few limitations other than those associated with their landscape position[17]". Further soil analysis along the Gilbert River (beyond the 108,000 ha surveyed at a 1:100 000 scale) may identify more suitable land for irrigated agriculture along the river.



"By 2020, half of the worlds population will be on Australia's northern doorstep – an estimated four billion people – an increase of 500 million – across Asia, with economic growth of 7% per annum, presents unparalleled opportunities for Australia's economy, especially our farm sector

National Farmer's Federation President
David Crombie, 23 November 2007

6. Social Context

General characteristics of the Gulf communities include[18]:

- Welfare reliance
- Low skills levels
- Low education, minimal education facilities
- Low income levels
- Low levels of home and land ownership
- 55% plus of population indigenous.

The Gulf Savannah Shires are classified as disadvantaged[19] and the 2007 Financial Sustainability Review by the Queensland Treasury Corporation, classified Carpentaria as 'Very Weak' and Etheridge as 'Moderate', emphasizing their delicate financial position. A recent Productivity Commission report (Assessing Local Government Revenue Raising Capacity) acknowledged that Councils in remote and rural areas would struggle to increase their revenue from rates "and would remain dependent on grants from other levels of government[20]".

This level of disadvantage is evident in Table 4, which shows a comparison between Etheridge Shire and Queensland/ Australia for three key income and education indicators.

Table 4: Key Socio-Economic Indicators: Etheridge Shire[21]

	Etheridge	Queensland	Australia
Average Weekly Individual Income	$384	$476	$466
Median Household Income	$673	$1033	$1027
Completed Year 12	21.44%	32.77%	33.86%

In 2000, a Social Issues Report was prepared by the Department of Natural Resources to allow for the scanning of social issues that would require further assessment and analysis in later stages of planning for water infrastructure associated with the Gilbert River. The report put forward a range of recommendations "that should be used to develop terms of reference for the social impact assessment component of any future impact assessment study[22]".

The report found that:

- there is broader local community support for the dam options due to the perceived development and recreational opportunities
- the dam options will inundate some areas of pastoral leases and will potentially inundate the Green Hills homestead
- the resumption of land will be required with the dam options with no resumption of land required with the weir option
- some local landholders have raised concerns over the compulsory resumption of land around the potential irrigation area
- concerns associated with the options include the environmental impact including the impacts on fisheries located in the Gulf of Carpentaria
- the current local availability of labour in the Etheridge Shire is limited and a strategy would be required on labour market requirements during the associated operational phases.

Subsequent discussions with the community in 2009 indicate that landholders within the irrigation area are concerned that their land may be compulsory acquired if they do not wish to pursue cropping.

Gulf Savannah Development, in partnership with Etheridge Shire Council, launched a five-year Investment and Migration Attraction project in July 2008, which is endeavoring to build labor supply in the region. Other Shires have been supportive of further investigations into the Gilbert River, given perceived broader regional benefits from the project.

It is noted that the area of interest from Chadshunt to Mount Sircom is subject to three separate native title determination applications that have been lodged and registered with the Federal Court. The applications are EWAMIAN #2 QC99/013; EWAMIAN #3 QC01/016; and TAGALAKA #2 QC01/022.

Prior to undertaking any dealing with land or water that may affect or extinguish native title rights and interests, native title issues need to be addressed in accordance with the provisions of the Native Title Act 1993. It may also be necessary to enter into a cultural heritage management plan or plans with the custodian Aboriginal cultural heritage body or bodies.

7. Environmental Context

The Gulf of Carpentaria drainage division is the largest in Australia with a massive 24.4% of the nation's water runoff[23]. The Gilbert River catchment has a mean annual discharge of 4,375,000 ML per annum[24], of which only 0.81% is currently allocated[25]. A dam of 300,000 ML capacity with an annual yield of 100,000 ML would require an annual water take-off of around 200,000 ML per annum (taking into account evaporation).

Rainfall records demonstrate that the Gilbert River experiences reliable annual rainfall whereas other rivers in the region may quite regularly miss out at least one year. The Gilbert River thus appears to have some natural advantage over other catchments in the region due possibly to its closer proximity to the east coast and Gulf of Carpentaria rainfall influences and possibly to the nature of the catchment in the Einasleigh Uplands[26].

Northern Gulf Resource Management Group (NGRMG) was commissioned to provide a statement of environmental values associated with the Gilbert River for the purpose of this report[27].

The report concludes that "there is general paucity of information on many of the environmental values described …. and potentially on others that have not been described. Research into the recreational (e.g. recreational fishing, amenity), cultural (indigenous/ non-indigenous heritage) and other environmental values is required to describe the suite of existing environmental values and estimate the potential impacts of dam/irrigation development……. The elicitation of specific environmental values for any particular ecosystem requires ecological assessment to identify the range of processes and species present and their condition. …. Any development that involves a tradeoff between commercial values and environmental values (i.e. development of an irrigation scheme) in the area should ensure that the full suite of values is accounted for and the true net benefits of the project proposal are understood[28]".

The report does indicate that potential environmental issues are:

- impacts on downstream wetlands and impacts on the river and its aquatic communities
- impacts on the Gulf of Carpentaria fishing industry.

The report also identifies that:

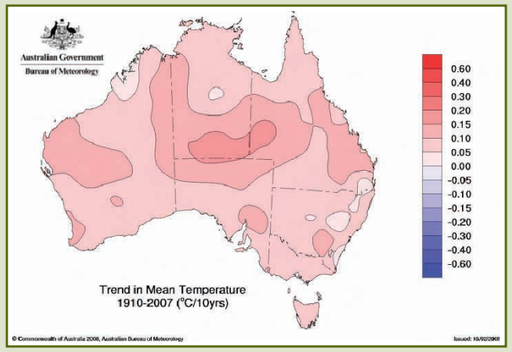
- the majority of remnant vegetation that would be inundated is not considered to be of current concern
- the majority of vegetative communities within the irrigation area is not considered to be of current concern.

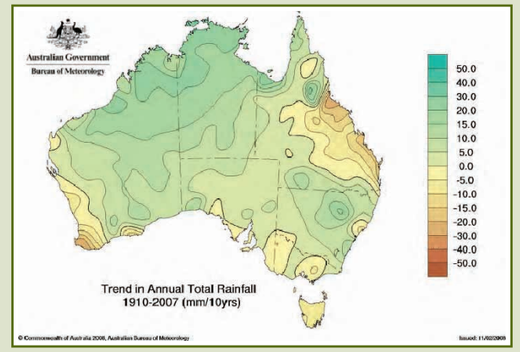
The *Vegetation Management Act 1999* regulates the clearing of native vegetation in Queensland. The Act sets the rules and regulations that guide vegetation clearing. It regulates clearing of remnant vegetation on freehold land, and of remnant and some non-remnant vegetation on state tenures.

8. Competitive Advantages

Competitive Advantages of the Gilbert River include:

- The Gilbert River catchment has regular and reliable annual rainfall
- Gulf region projected to have steady/ increased rainfall through climate change (unlike southern Australia)
- Water allocations from the Gilbert River are currently very low and under-utilised
- Growing conditions are highly suitable for a diverse range of crops
- Dry climate means reduced pest and disease loads and thus reduced business inputs/costs
- Irrigation area highly suitable for organic production and establishment of an organic precinct
- The region's early cropping season opens up market windows and the opportunity for premium prices
- Additional suitable soils already identified and thus scope for expansion into the future
- Competitive land prices
- Opportunities to integrate cropping activities with, and add value to, the established beef cattle grazing industry
- Proximate to Asian export markets and counter seasonality with agricultural production in Asia
- Equidistant to the Ports of Townsville, Cairns and Karumba
- Gulf Development Road runs through the proposed irrigation area
- Gilbert River runs into the Gulf of Carpentaria, thus would not add to environmental pressures on the Great Barrier Reef
- Federal Government policy supports agricultural development in Northern Australia.





9. Investment

It is apparent that Queensland Government policy in recent years has favored private sector investment in water infrastructure that is principally for agricultural purposes. The Federal Government has recently demonstrated a willingness to invest in the 'social and open access' infrastructure that would support growth of irrigated agriculture in Northern Australia.

The State's 1999 cost estimate of $33 million for a 23 metre high dam on the Gilbert River is considered "very approximate[29]".

A more certain cost estimate for a dam at the Green Hills site requires major investigation including development of a dam arrangement based on current mapping with a high level of geotechnical and hydrologic investigation, a rigorous assessment of general and overhead costs, and allowances for environmental management and compensation costs.

In 2007, consultants were engaged by the Department of Infrastructure and Planning to review cost estimates for Queensland water projects including for the Connors River Dam in Central Queensland, which is closest in size to the Green Hills Dam. Based on recent estimates for the Connors River Dam project, a Green Hills Dam with a storage capacity from 150000 ML to 336000 ML could be expected to cost around $200 million[30].

Etheridge Shire Council has also identified a range of investments that would facilitate the viability and growth of irrigated agriculture in the region and facilitate broader regional development outcomes. These are summarised in Table 5. Investments could be private sector or Government-led.

Table 5: Supporting Investments

Item	Rationale	Indicative Cost (where available)
Replacement of Einasleigh River bridge	Improves access into and out of the region during the wet season	$18 million ** funded by Federal Government in April 2009*
Upgrade of Gilbert River Power Supply	Provision of 3-phase power to irrigators to improve the economic efficiency of irrigated agriculture and reduce greenhouse emissions	$5 million
Upgrade of Hann Highway	To improve access into southern markets for Gilbert River and other North Queensland products	$50 million
Establishment of Gulf Agricultural College	A 'virtual' college to develop appropriate skills among the local community in terms of irrigated agriculture and grazing and promote retention of youth in the region	$2 million
Upgrade of Health Services, Education Services	To support the increase in population likely to result from irrigated agriculture	n/a
Improved Housing Supply	To support the increase in population likely to result from irrigated agriculture	n/a
Indigenous Training and Employment Initiatives	To facilitate indigenous participation in the agricultural economy	n/a
Upgrade of Port Karumba/ Normanton airport	To facilitate export of product from the Gulf and improve the international competitiveness of Gulf product	n/a
Mobile Phone coverage at Gilbert River	To improve operational efficiency of Gilbert River producers	$1.5 million

10. Policy Setting

Development of an irrigation area along the Gilbert River would meet a range of national policy objectives. This is elaborated within Table 6.

- ✔ Nationally significant due to drying of southern Australia and national food and water security issues
- ✔ Would lift national productivity
- ✔ Would strengthen Australia's international competitiveness, especially through proximity to Asia including via the Port of Karumba
- ✔ Would develop a region classified as *Very Remote and Disadvantaged* and would improve the quality of life for Gulf Savannah residents
- ✔ Would provide employment opportunities in the construction and agricultural industries.

Table 6: Gilbert River Policy Matrix

Policy	Outcomes
Expand Australia's Productive Capacity	• A new irrigation area would increase Australia's agricultural productive capacity at a time when other agricultural regions are under threat from climate change and over allocation. • Suitable soils exist for possible expansion of the area over time, once key infrastructure investments have been made. • Investments in human resources and common use infrastructure would also lift productive capacity of the region.
Increase Australia's Productivity	• 13,800 ha of irrigated agriculture along the Gilbert River would conservatively generate gross revenue of $68.8 million per annum and provide opportunities for growth of small business in supply of relevant goods and services.
Diversify Australia's Economic Capabilities	• A new irrigation area would assist in maintaining the diversity of Australian agricultural industries at a time when other agricultural regions are under threat from climate change and over allocation. • Would diversify the economy of the Gulf Savannah region and would add-value to the region's beef cattle industry through fattening within the region. • Investments in human resources and common use infrastructure would also lift economic capabilities and enhance our international competitiveness in Asian markets (eg: Port Karumba).
Build on Australia's Competitive Advantages	• The project builds on Australia's position as a globally significant food exporter. • An organic precinct would strengthen Australia's image as a 'clean and green' agricultural producer. • Infrastructure investments such as Port Karumba would improved access into Asia for agricultural exports. • Develop Australia's 'dry tropics' expertise.
Develop our Cities/ Regions	• The Gulf Savannah region is classified as Very Remote and Disadvantaged. Irrigation would significantly contribute to wealth creation and retention of wealth within the region. • The Gilbert River project would have flow-on benefits for neighboring Shires including the Gulf's majority indigenous population, as well as for larger service centers such as Cairns and Atherton. • Sustainable agricultural production provides long term benefits as compared to the boom and bust cycle of mining.
Reduce Greenhouse Emissions	• Shifting agricultural production to Northern Australia will reduce transport costs and greenhouse emissions for exports into Asia. • Better social infrastructure will facilitate mining workers being resident in the region. • Better availability and local delivery of goods and services within the Gulf Savannah will reduce transport costs for residents. • Reduced diesel generation costs through improved power supply to the Gilbert River. • Possible scope for bio-diesel or hydro power production within the region.
Improve Social Equity and Quality of Life	• Will facilitate improved economic and social conditions for Gulf savannah residents. • Will provide important employment and training benefits for the region's indigenous population. • Provides a sustainable economic future for the region.

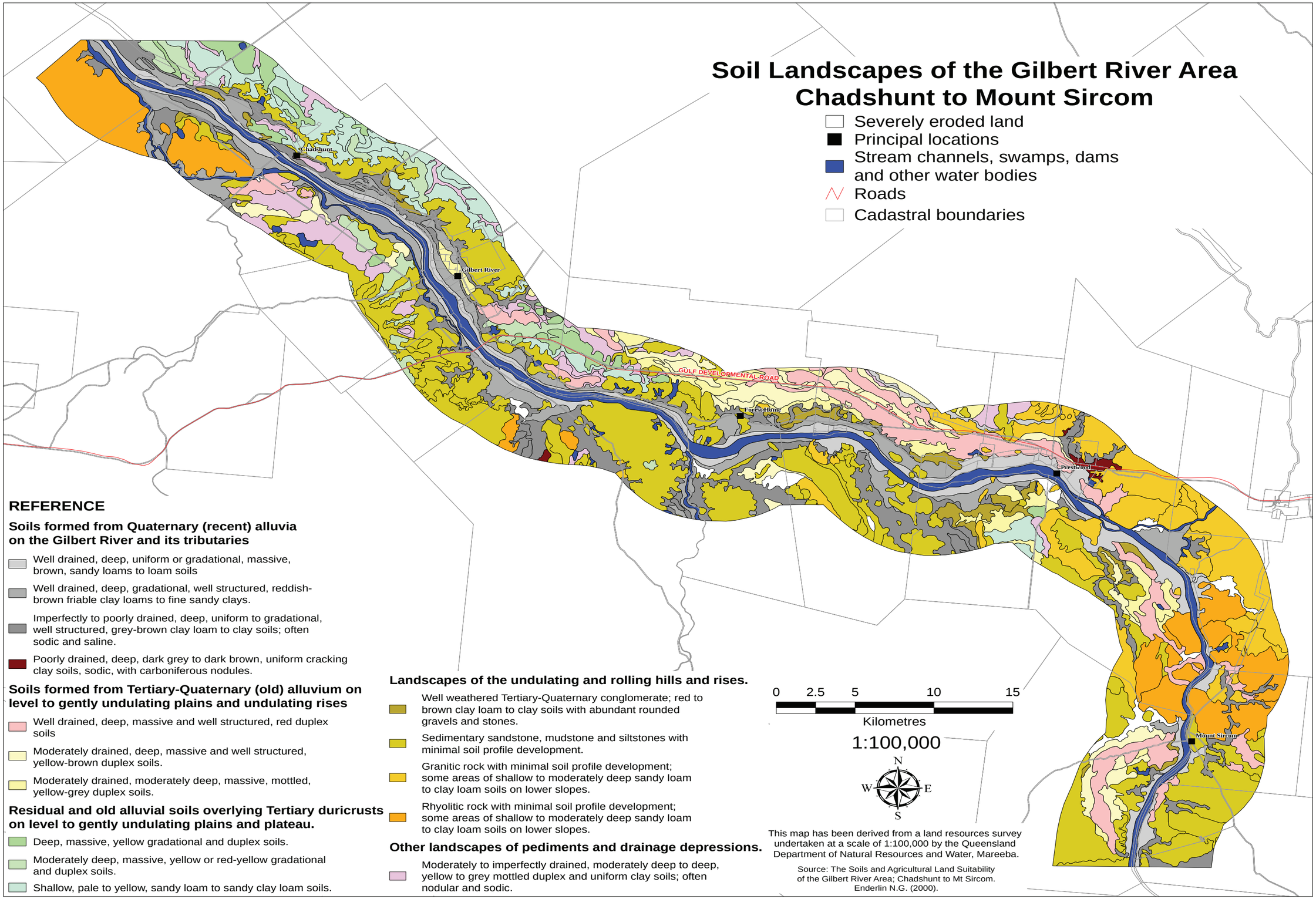
11. Next Steps

Establishment of the Gilbert River irrigation area requires private sector investment, as well as support from both the Federal and State Governments:

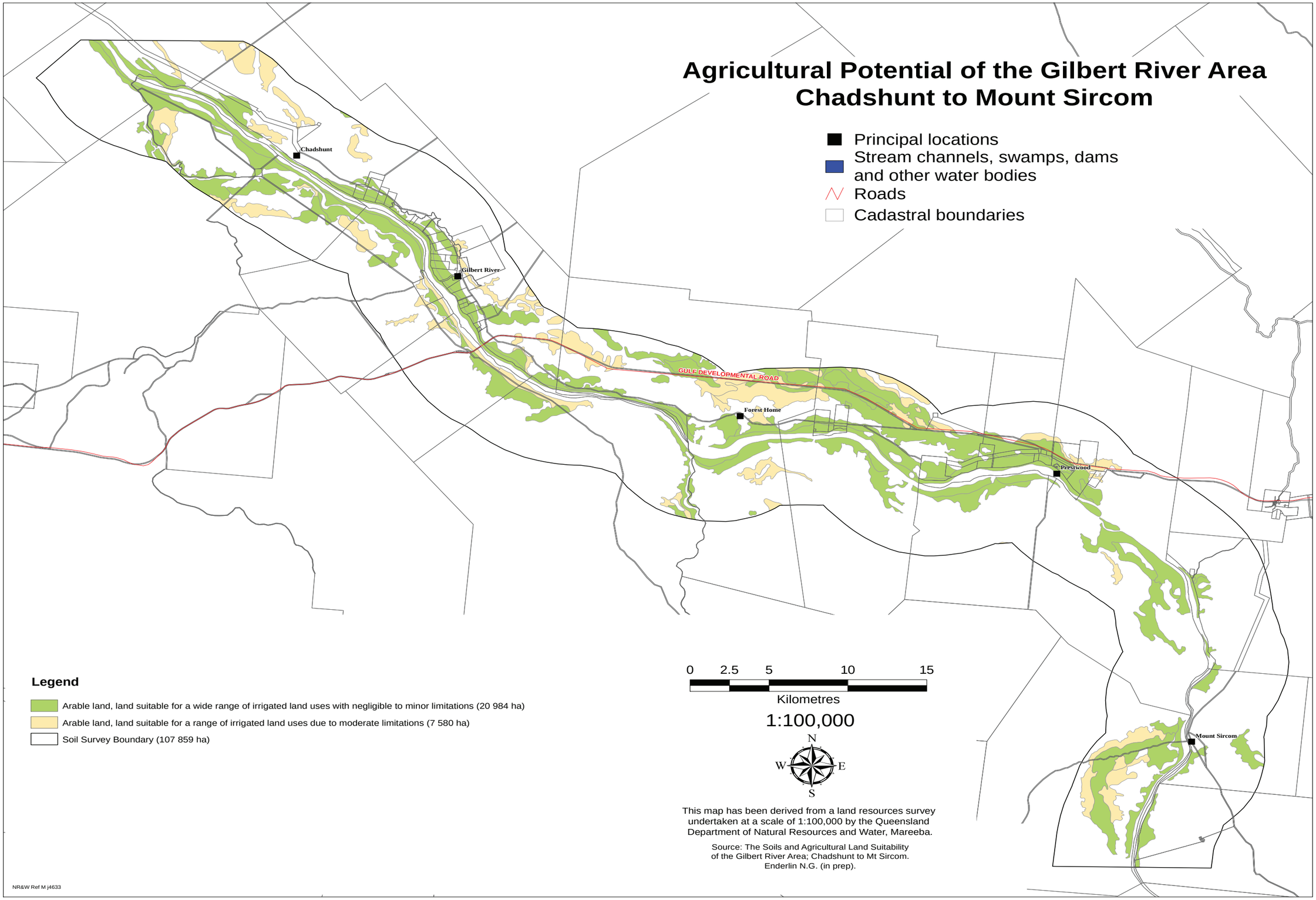
- Federal Government investment in the irrigation area, and in the supporting investments identified in Table 5, would facilitate private sector investment, enhance the profitability of the area and deliver significant regional development outcomes
- the State Government would need to address relevant issues including issues under the *Vegetation Management Act* and the *Gulf Water Resources Plan*
- private sector investment interest is required to prove the demand for Gilbert River water that would trigger a review of the *Gulf Water Resources Plan* and to take up the actual production opportunities within the irrigation area.

Gulf Savannah Development and Etheridge Shire Council are committed to an irrigated agriculture area that is environmentally and ecologically sustainable, and will continue discussions with both levels of Government in this regard and will seek to confirm private sector investment interest. Further research will be required to progress this project and an approach will be made to the Commonwealth Government for funds to undertake this work.

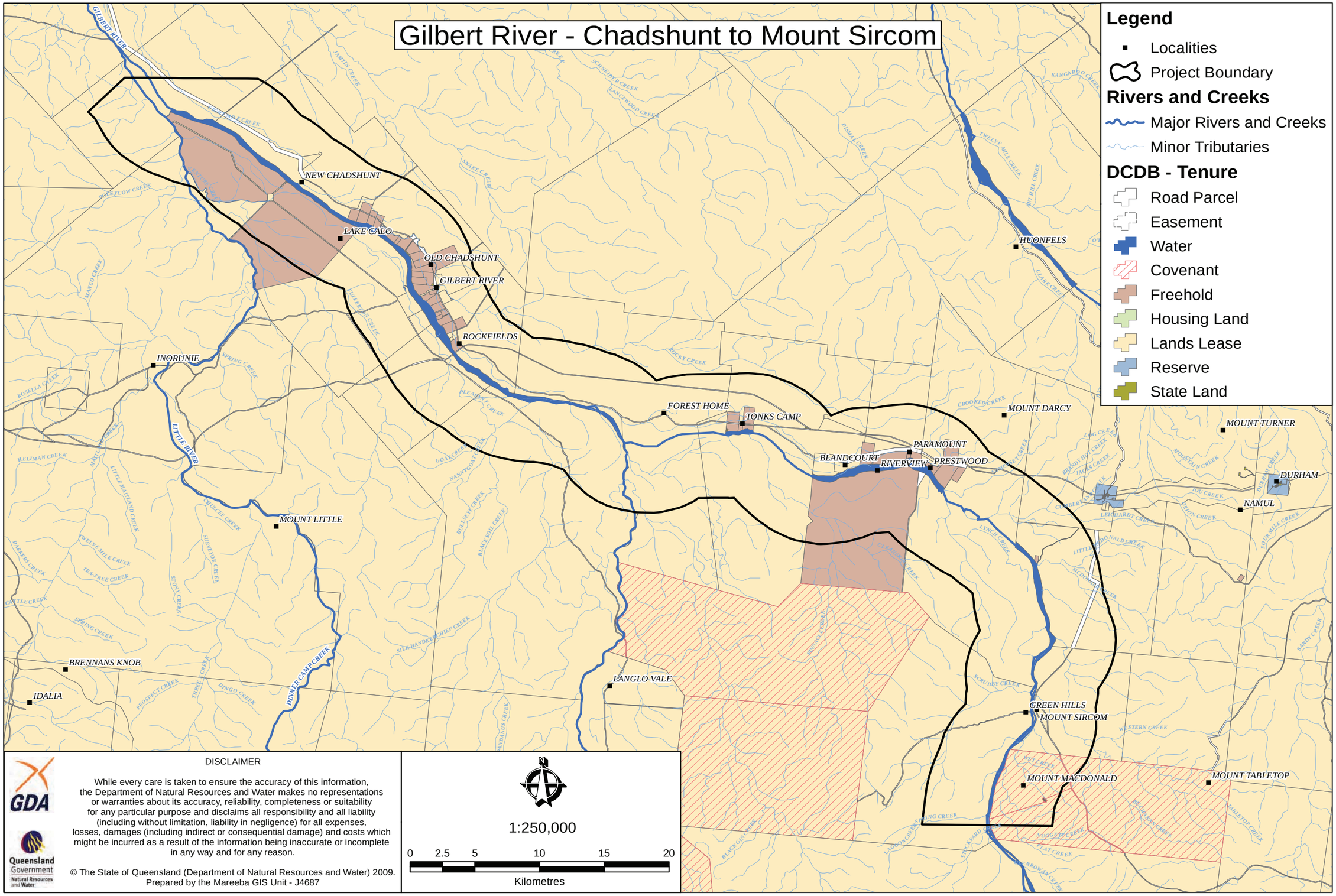
Map 1: Soil Landscapes of the Gilbert River Area - Chadshunt to Mount Sircom



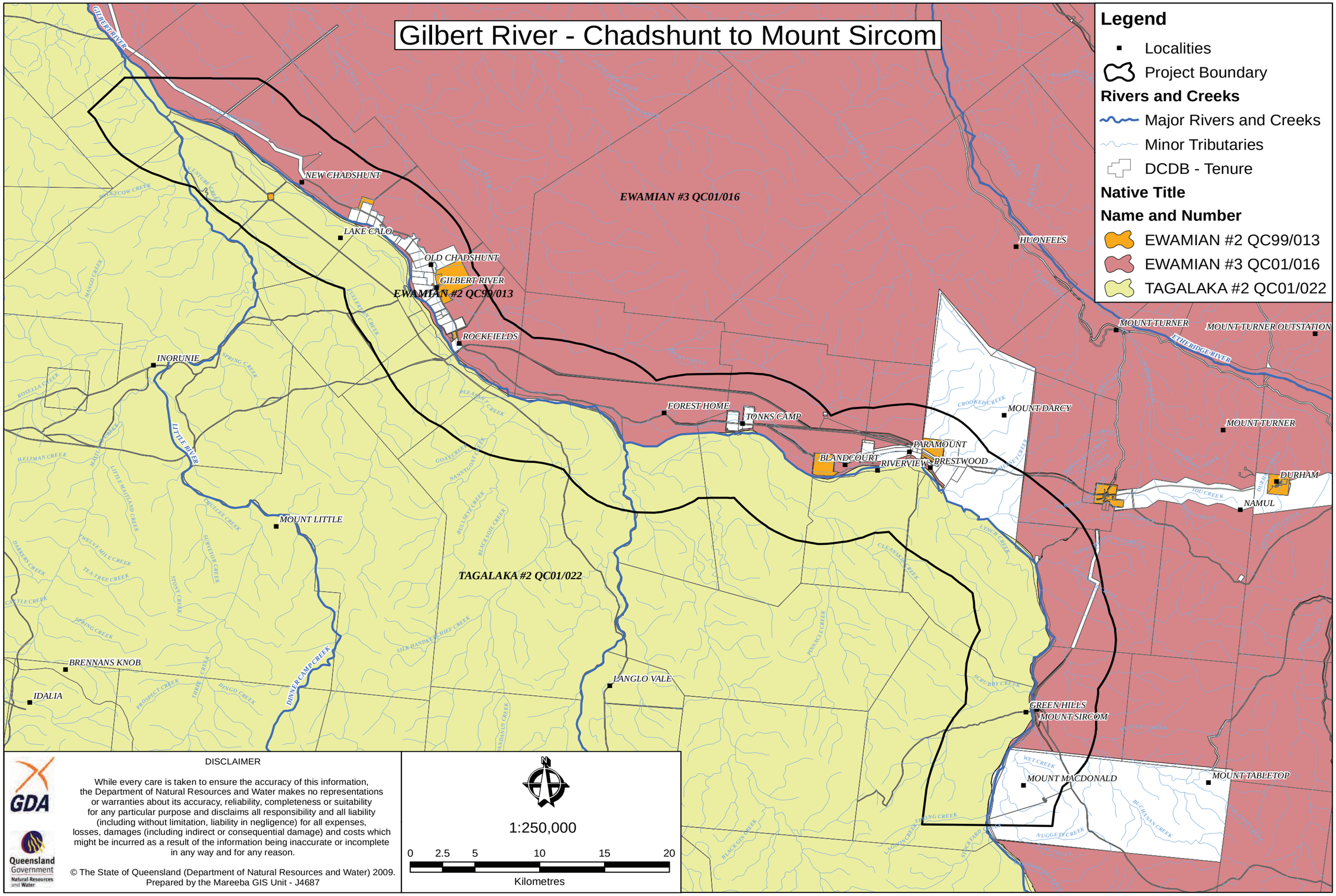
Map 2: Agricultural Potential of the Gilbert River Area - Chadshunt to Mount Sircom



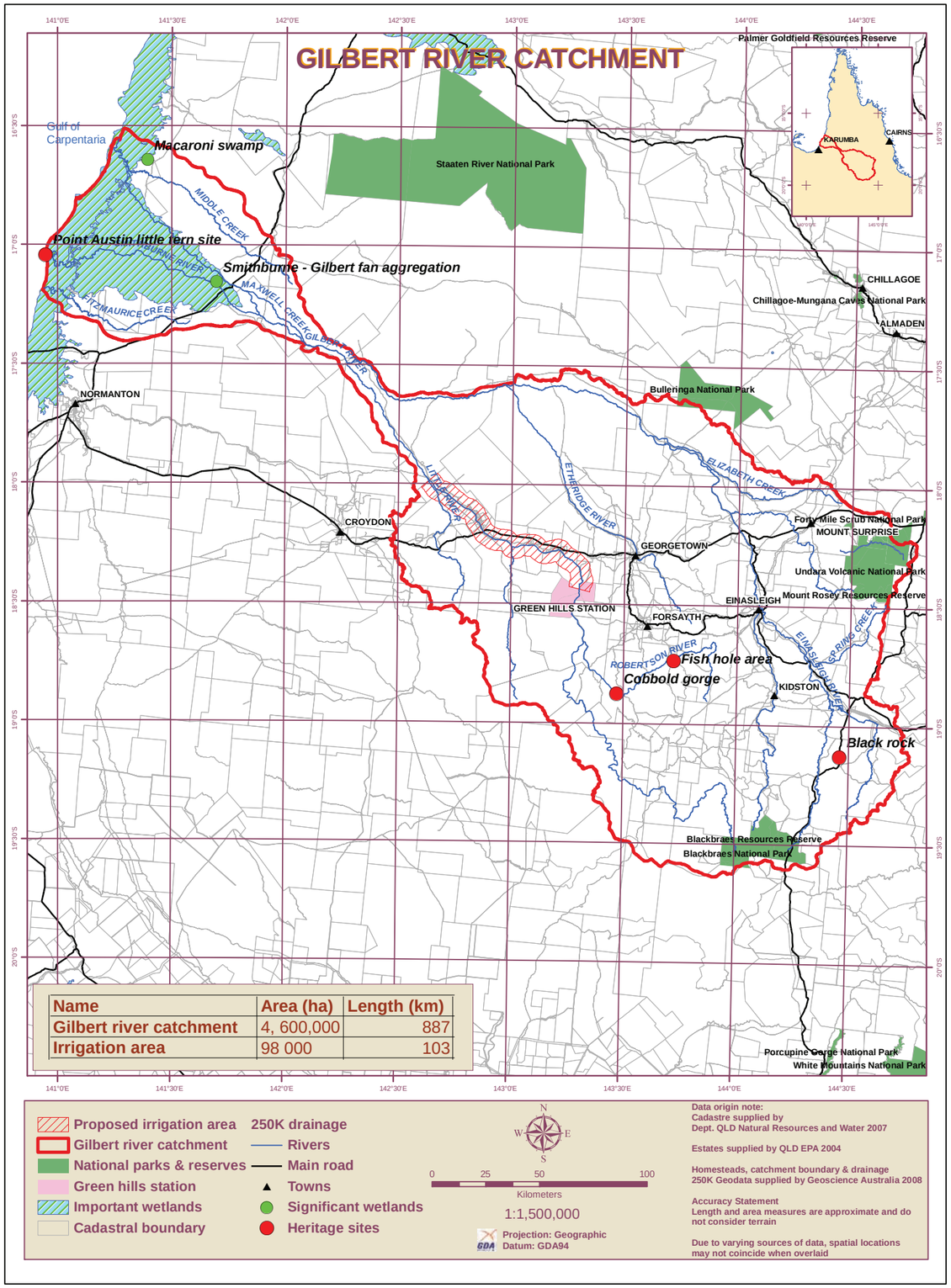
Map 3: Gilbert River - Chadshunt to Mount Sircom - Land Tenure



Map 4: Gilbert River - Chadshunt to Mount Sircom - Native Title



Map 5: Gilbert River In Context



Name	Area (ha)	Length (km)
Gilbert river catchment	4, 600,000	887
Irrigation area	98 000	103

Proposed irrigation area
Gilbert river catchment
National parks & reserves
Green hills station
Important wetlands
Cadastral boundary

250K drainage
Rivers
Main road
Towns
Significant wetlands
Heritage sites

N
W
E
S

0 25 50 100
Kilometers

1:1,500,000

Projection: Geographic
Datum: GDA94

Data origin note:
Cadastre supplied by
Dept. QLD Natural Resources and Water 2007

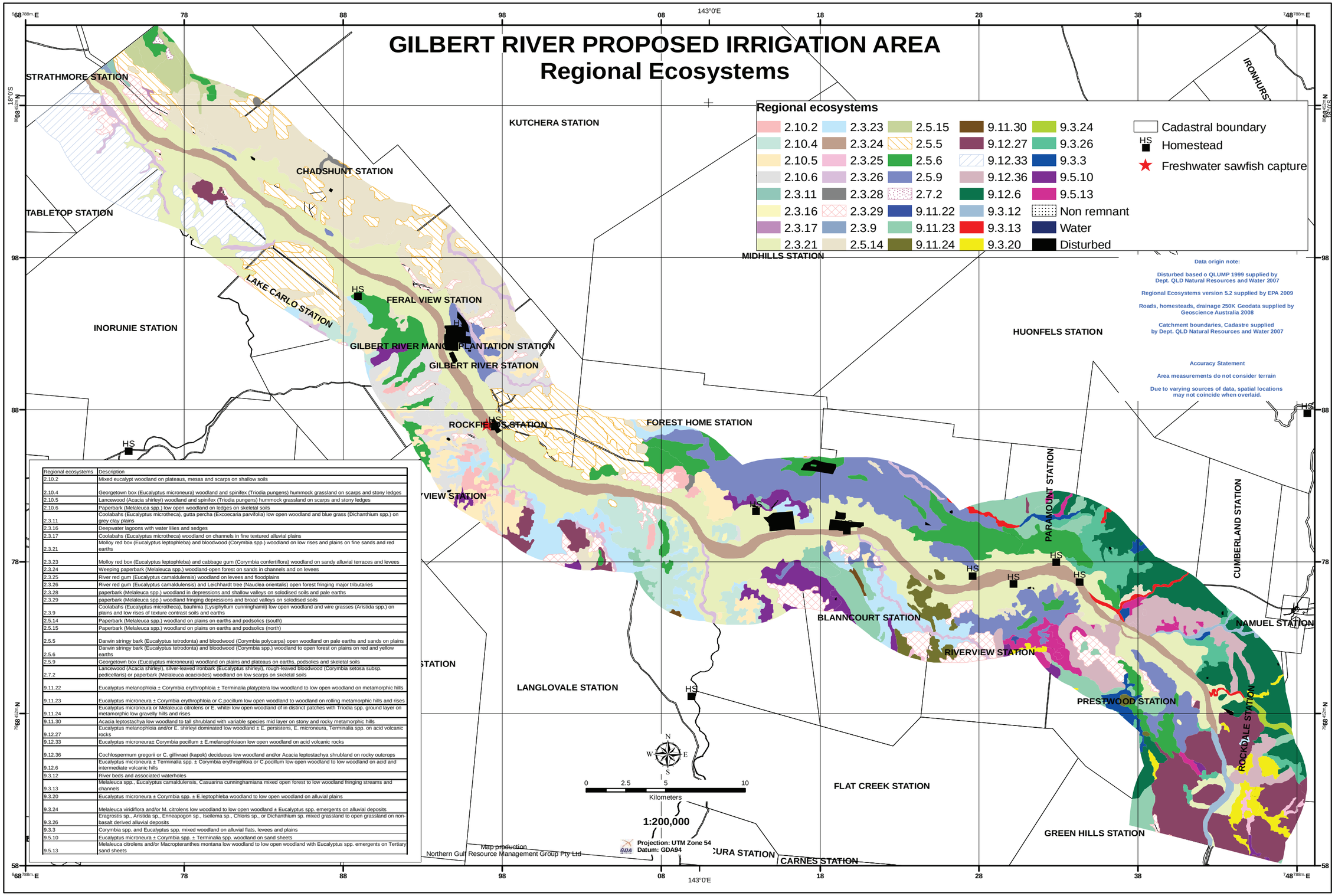
Estates supplied by QLD EPA 2004

Homesteads, catchment boundary & drainage
250K Geodata supplied by Geoscience Australia 2008

Accuracy Statement
Length and area measures are approximate and do not consider terrain

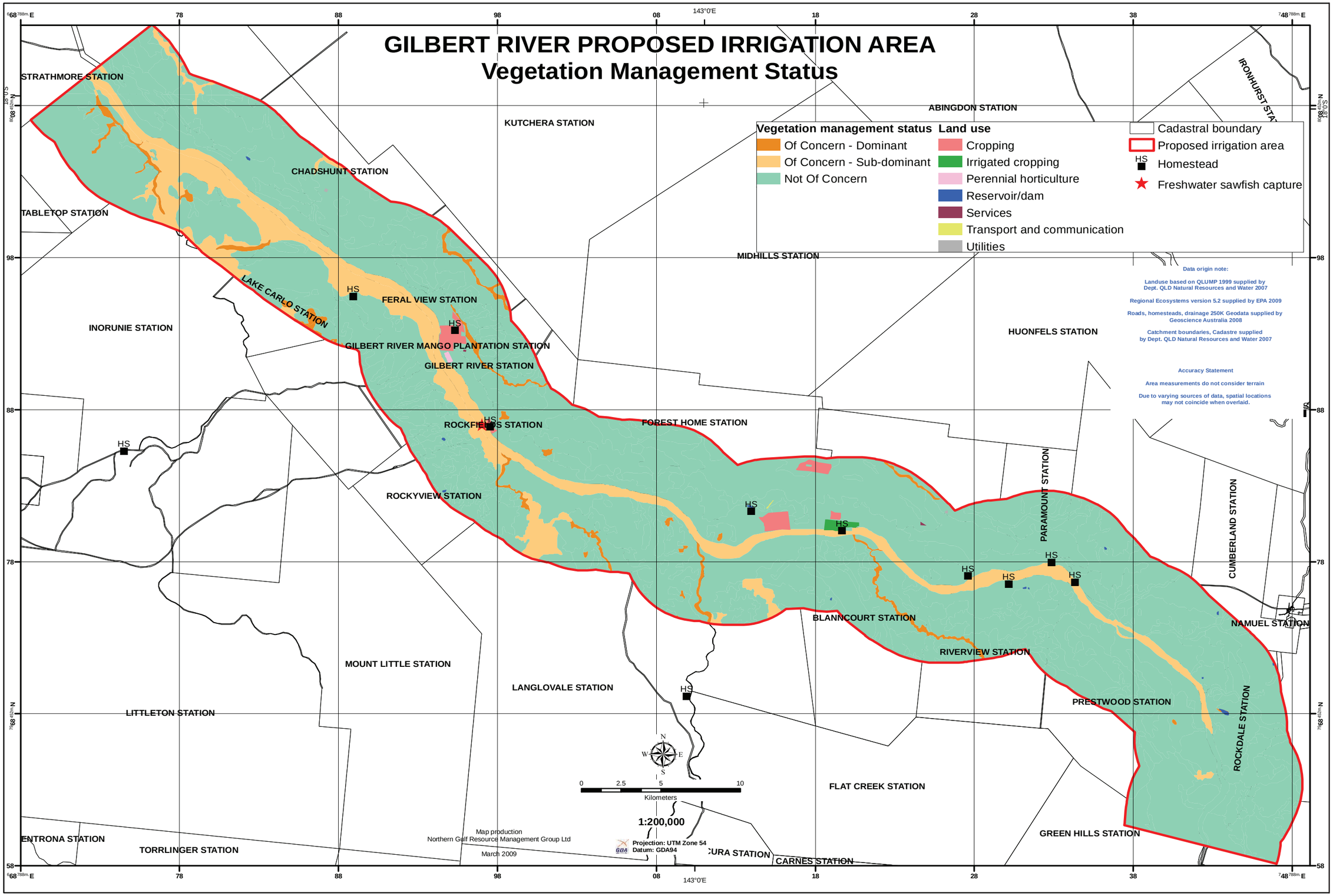
Due to varying sources of data, spatial locations may not coincide when overlaid

Map 6: Gilbert River Proposed Irrigation Area - Regional Ecosystems

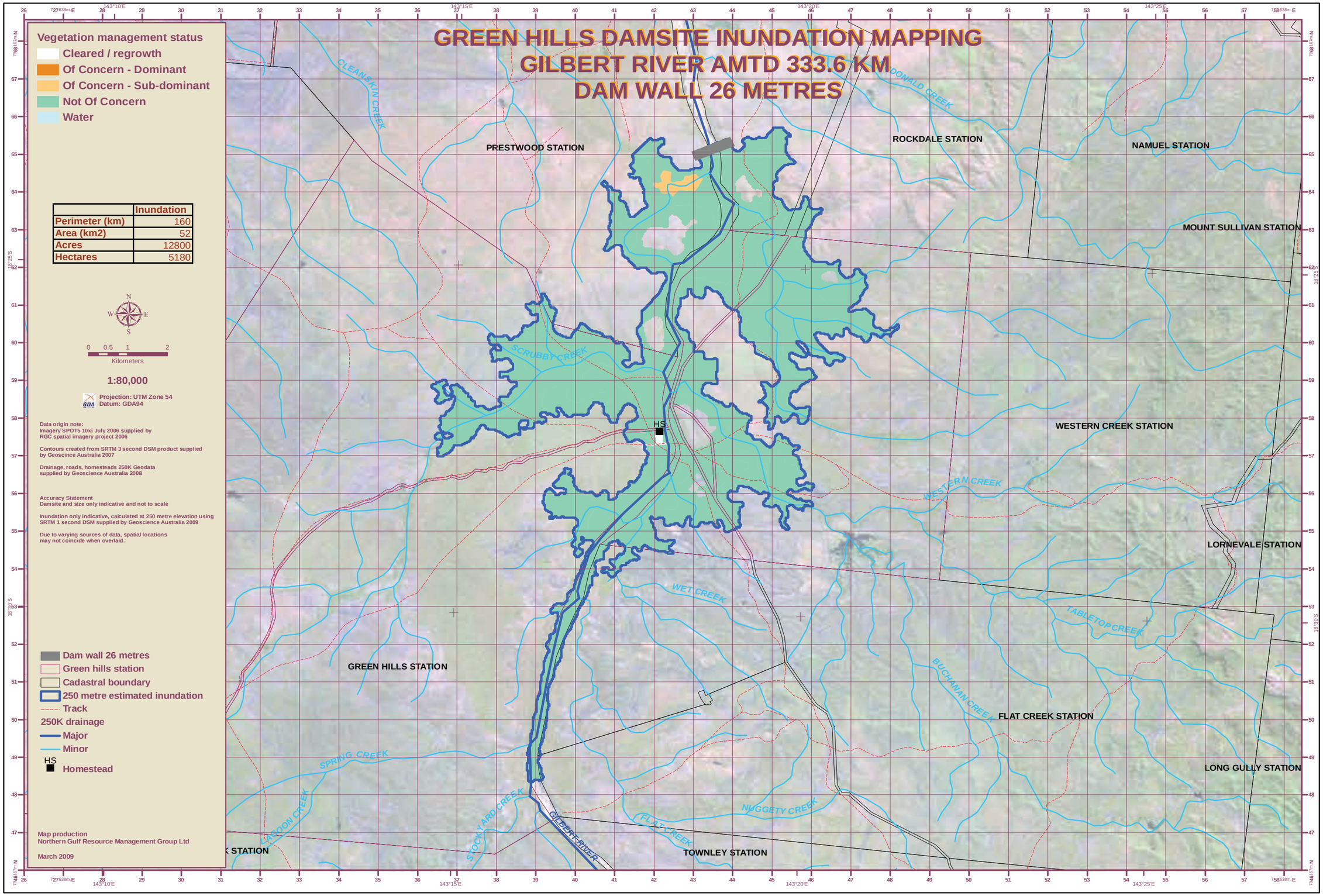


Regional ecosystems	Description
2.10.2	Mixed eucalypt woodland on plateaus, mesas and scarps on shallow soils
2.10.4	Georgetown box (Eucalyptus microneura) woodland and spinifex (Triodia pungens) hummock grassland on scarps and stony ledges
2.10.5	Lancewood (Acacia shirleyi) woodland and spinifex (Triodia pungens) hummock grassland on scarps and stony ledges
2.10.6	Paperbark (Melaleuca spp.) low open woodland on ledges on skeletal soils
2.3.11	Coolabahs (Eucalyptus microtheca), gutta percha (Excoecaria parvifolia) low open woodland and blue grass (Dichanthium spp.) on grey clay plains
2.3.16	Deepwater lagoons with water lilies and sedges
2.3.17	Coolabahs (Eucalyptus microtheca) woodland on channels in fine textured alluvial plains
2.3.21	Molloy red box (Eucalyptus leptophleba) and bloodwood (Corymbia spp.) woodland on low rises and plains on fine sands and red earths
2.3.23	Molloy red box (Eucalyptus leptophleba) and cabbage gum (Corymbia confertiflora) woodland on sandy alluvial terraces and levees
2.3.24	Weeping paperbark (Melaleuca spp.) woodland-open forest on sands in channels and on levees
2.3.25	River red gum (Eucalyptus camaldulensis) woodland on levees and floodplains
2.3.26	River red gum (Eucalyptus camaldulensis) and Leichhardt tree (Nauclea orientalis) open forest fringing major tributaries
2.3.28	paperbark (Melaleuca spp.) woodland in depressions and shallow valleys on solodised soils and pale earths
2.3.29	paperbark (Melaleuca spp.) woodland fringing depressions and broad valleys on solodised soils
2.3.9	Coolabahs (Eucalyptus microtheca), bauhinia (Lysiphyllum cunninghamii) low open woodland and wire grasses (Aristida spp.) on plains and low rises of texture contrast soils and earths
2.5.14	Paperbark (Melaleuca spp.) woodland on plains on earths and podsolics (south)
2.5.15	Paperbark (Melaleuca spp.) woodland on plains on earths and podsolics (north)
2.5.5	Darwin stringy bark (Eucalyptus tetrodonta) and bloodwood (Corymbia polycarpa) open woodland on pale earths and sands on plains
2.5.6	Darwin stringy bark (Eucalyptus tetrodonta) and bloodwood (Corymbia spp.) woodland to open forest on plains on red and yellow earths
2.5.9	Georgetown box (Eucalyptus microneura) woodland on plains and plateaus on earths, podsolics and skeletal soils
2.7.2	Lancewood (Acacia shirleyi), silver-leaved ironbark (Eucalyptus shirleyi), rough-leaved bloodwood (Corymbia setosa subsp. pedicellaris) or paperbark (Melaleuca acacioides) woodland on low scarps on skeletal soils
9.11.22	Eucalyptus melanophloia ± Corymbia erythrophloia ± Terminalia platyptera low woodland to low open woodland on metamorphic hills
9.11.23	Eucalyptus microneura ± Corymbia erythrophloia or C.pocillum low open woodland to woodland on rolling metamorphic hills and rises
9.11.24	Eucalyptus microneura or Melaleuca citrolens or E. whitei low open woodland of in distinct patches with Triodia spp. ground layer on metamorphic low gravelly hills and rises
9.11.30	Acacia leptostachya low woodland to tall shrubland with variable species mid layer on stony and rocky metamorphic hills
9.12.27	Eucalyptus melanophloia and/or E. shirleyi dominated low woodland ± E. persistens, E. microneura, Terminalia spp. on acid volcanic rocks
9.12.33	Eucalyptus microneura± Corymbia pocillum ± E.melanophloiaon low open woodland on acid volcanic rocks
9.12.36	Cochlospermum gregorii or C. gillivraei (kapok) deciduous low woodland and/or Acacia leptostachya shrubland on rocky outcrops
9.12.6	Eucalyptus microneura ± Terminalia spp. ± Corymbia erythrophloia or C.pocillum low open woodland to low woodland on acid and intermediate volcanic hills
9.3.12	River beds and associated waterholes
9.3.13	Melaleuca spp., Eucalyptus camaldulensis, Casuarina cunninghamiana mixed open forest to low woodland fringing streams and channels
9.3.20	Eucalyptus microneura ± Corymbia spp. ± E.leptophleba woodland to low open woodland on alluvial plains
9.3.24	Melaleuca viridiflora and/or M. citrolens low woodland to low open woodland ± Eucalyptus spp. emergents on alluvial deposits
9.3.26	Eragrostis sp., Aristida sp., Enneapogon sp., Iseilema sp., Chloris sp., or Dichanthium sp. mixed grassland to open grassland on non-basalt derived alluvial deposits
9.3.3	Corymbia spp. and Eucalyptus spp. mixed woodland on alluvial flats, levees and plains
9.5.10	Eucalyptus microneura ± Corymbia spp. ± Terminalia spp. woodland on sand sheets
9.5.13	Melaleuca citrolens and/or Macropteranthes montana low woodland to low open woodland with Eucalyptus spp. emergents on Tertiary sand sheets

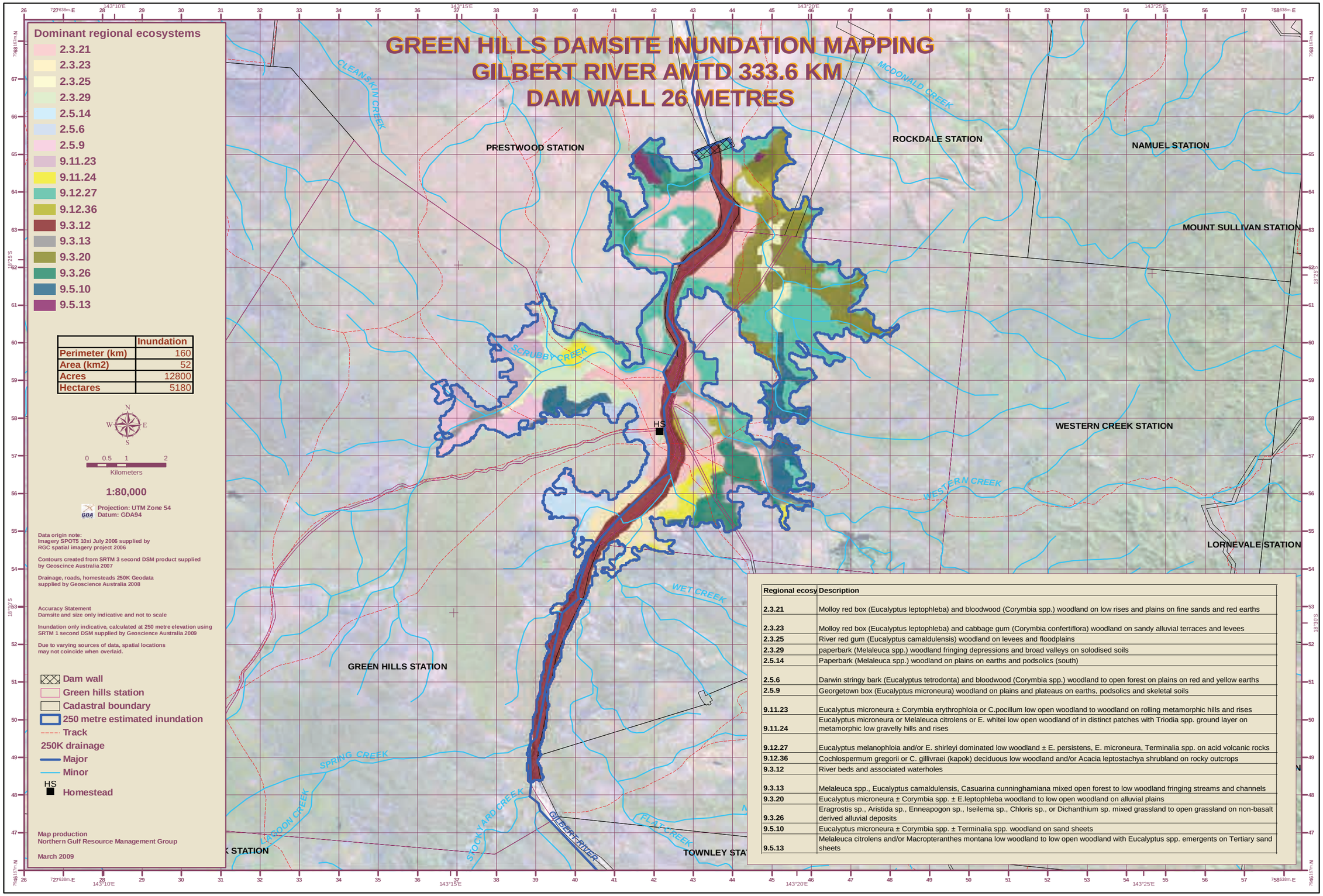
Map 7: Gilbert River Proposed Irrigation Area - Vegetation Management Status



Map 8: Green Hills Damsite - Inundation Mapping



Map 9: Green Hills Damsite - Inundation Mapping (Regional Ecosystems)



Regional ecosy	Description
2.3.21	Molloy red box (Eucalyptus leptophleba) and bloodwood (Corymbia spp.) woodland on low rises and plains on fine sands and red earths
2.3.23	Molloy red box (Eucalyptus leptophleba) and cabbage gum (Corymbia confertiflora) woodland on sandy alluvial terraces and levees
2.3.25	River red gum (Eucalyptus camaldulensis) woodland on levees and floodplains
2.3.29	paperbark (Melaleuca spp.) woodland fringing depressions and broad valleys on solodised soils
2.5.14	Paperbark (Melaleuca spp.) woodland on plains on earths and podsolics (south)
2.5.6	Darwin stringy bark (Eucalyptus tetrodonta) and bloodwood (Corymbia spp.) woodland to open forest on plains on red and yellow earths
2.5.9	Georgetown box (Eucalyptus microneura) woodland on plains and plateaus on earths, podsolics and skeletal soils
9.11.23	Eucalyptus microneura ± Corymbia erythrophloia or C.pocillum low open woodland to woodland on rolling metamorphic hills and rises
9.11.24	Eucalyptus microneura or Melaleuca citrolens or E. whitei low open woodland of in distinct patches with Triodia spp. ground layer on metamorphic low gravelly hills and rises
9.12.27	Eucalyptus melanophloia and/or E. shirleyi dominated low woodland ± E. persistens, E. microneura, Terminalia spp. on acid volcanic rocks
9.12.36	Cochlospermum gregorii or C. gillivraei (kapok) deciduous low woodland and/or Acacia leptostachya shrubland on rocky outcrops
9.3.12	River beds and associated waterholes
9.3.13	Melaleuca spp., Eucalyptus camaldulensis, Casuarina cunninghamiana mixed open forest to low woodland fringing streams and channels
9.3.20	Eucalyptus microneura ± Corymbia spp. ± E.leptophleba woodland to low open woodland on alluvial plains
9.3.26	Eragrostis sp., Aristida sp., Enneapogon sp., Iseilema sp., Chloris sp., or Dichanthium sp. mixed grassland to open grassland on non-basalt derived alluvial deposits
9.5.10	Eucalyptus microneura ± Corymbia spp. ± Terminalia spp. woodland on sand sheets
9.5.13	Melaleuca citrolens and/or Macropteranthes montana low woodland to low open woodland with Eucalyptus spp. emergents on Tertiary sand sheets

12. Investment Enquiries

Investment enquiries in relation to the Gilbert River irrigation area should be directed to:

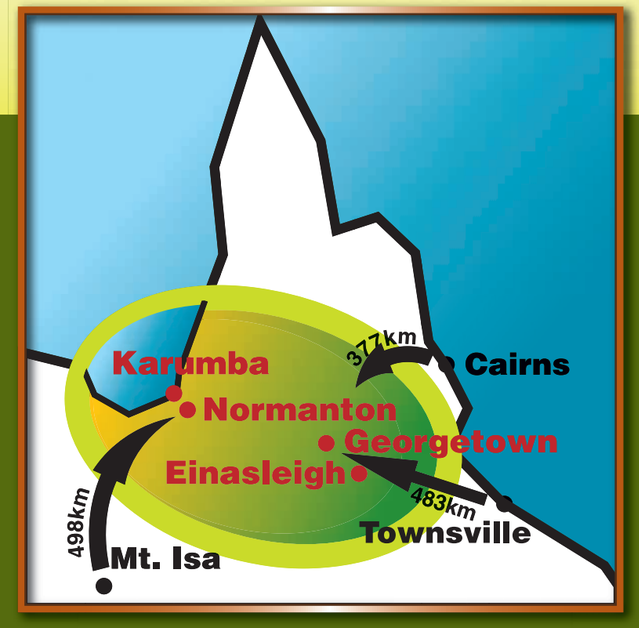
Cr Warren Devlin — Mayor, Etheridge Shire
mayor@etheridge.qld.gov.au
Phone: (07) 40 621 233 or mobile 0458 621 233

Rob Macalister — Chief Executive Officer, Gulf Savannah Development
ceo@gulf-savannah.com.au
Phone: (07) 40 311 631 or mobile 0447 167 092

Footnotes

[1] p.273, CSIRO, *An overview of climate change adaptation in Australian primary industries,* February 2008
[2] p.659, ABARE, *Australian Commodities,* December 2007
[3] p. 64, Water Infrastructure Task Force, *Final Report,* Queensland Government, February 2007
[4] p.7, Department of Natural Resources *Gulf Region Study - Engineering Assessment of Storage Options,* July 1998
[5] Department of Natural Resources, *Water Infrastructure Planning - Gulf Region Social Issues Report,* February 2000
[6] p.33, Department of Natural Resources and Mines, *Information Report - Gulf Draft Water Resource Plan,* June 2003
[7] p.58-9, Department of Natural Resources, Mines and Energy, *Gulf and Mitchell Agricultural Land and Water Resource Assessment Report,* 2004
[8] Executive Summary, TRaCK, *Collaborative Water Planning: Retrospective Case Studies: Water Planning in the Gulf of Carpentaria,* May 2008
[9] G. Mason: *Scoping Brief on the proposed Gilbert River Agricultural Precinct including a Marketing and Gross Margin Analysis Perspective:* DEEDI 2009.
It needs to be noted that the projections in the Scoping Brief only give indicative likely outcomes of the proposed cropping income, production and water consumption streams. It does not indicate the profitability or viability of the proposed Gilbert River agricultural precinct
[10] p. 6, G. Mason, op. cit
[11] p. 17, G. Mason, op. cit
[12] p. 28, *East Kimberley Development Package: Expanding the Ord,* Government of Western Australia, 2008
[13] The 2008 GSD report *Economic Leakage in the Gulf Savannah* identified that households, organisations and, in particular, small business, were purchasing a high level of goods and services outside of the region. A 2007 Tropical Savannahs CRC report *(Regional Economic Multipliers in Australia's Tropical Savannah)* found that, in 'very remote' areas across Northern Australia, the agriculture industry spent 0.36% of their revenue locally.
[14] Dec 2008 figures: http://www.workplace.gov.au/workplace/Publications/ResearchStats/LabourMarketAnalysis/SmallAreaLabourMarkets/SmallAreaLabourMarkets-Australia.htm
[15] Department of Natural Resources: *An Assessment of Agricultural Potential of Soils in the Gulf Region,* 1999
[16] N. Enderlin, *Soils of the Gilbert River,* Department of Natural Resources, unpublished
[17] p. 29, Department of Natural Resources, Mines and Energy, *Gulf and Mitchell Agricultural Land and Water Resource Assessment Report,* 2004
[18] Gulf Savannah Development: *Gulf Savannah Business Expansion Strategy,* 2006
[19] *Country Matters: Social Atlas of Rural and Regional Australia,* Commonwealth Government 2004
[20] Productivity Commission; *Assessing Local Government Revenue Raising Capacity,* 2008
[21] ABS Census Results 2006
[22] p. 4, Department of Natural Resources, *Water Infrastructure Planning; Gulf Region Social Issues Report,* February 2000
[23] Table 5, *State of the Environment: Inland Waters, Environment Australia,* 2001
[24] p. 22, Department of Natural Resources, Mines and Energy, *Gulf and Mitchell Agricultural Land and Water Resource Assessment Report*, 2004
[25] p.45, Department of Natural Resource and Water, *Gulf Draft Water Resource Plan,* 2006
[26] personal communication: DERM May 2009
[27] Greiner et al: Gilbert River Irrigation Project: Preliminary Business Case: Environmental Values: NGRMG 2009
[28] pp. 8-9, R. Greiner op. cit.
[29] personal communication: DERM, 2009
[30] personal communication: DERM, 2009

Gulf Savannah



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