



A three year strategic plan for management of the natural resources of the Mitchell River catchment developed by its stakeholders

# Mitchell River Watershed Strategic Plan

2013-2016

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# Mitchell River Watershed Strategic Plan 2013-2016

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COUNTRY

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## EXECUTIVE SUMMARY

The Mitchell River Watershed Strategic Plan 2013-2016 is an update of the Mitchell River Watershed Management Plan created in 2000. It should be used to guide the direction of the Mitchell River watershed management group in prioritising the work they do in the catchment, and should be reviewed in 2016. The original plan written in 2000 contains detailed information on the watershed and its issues, and should be used a reference document to supplement this document.

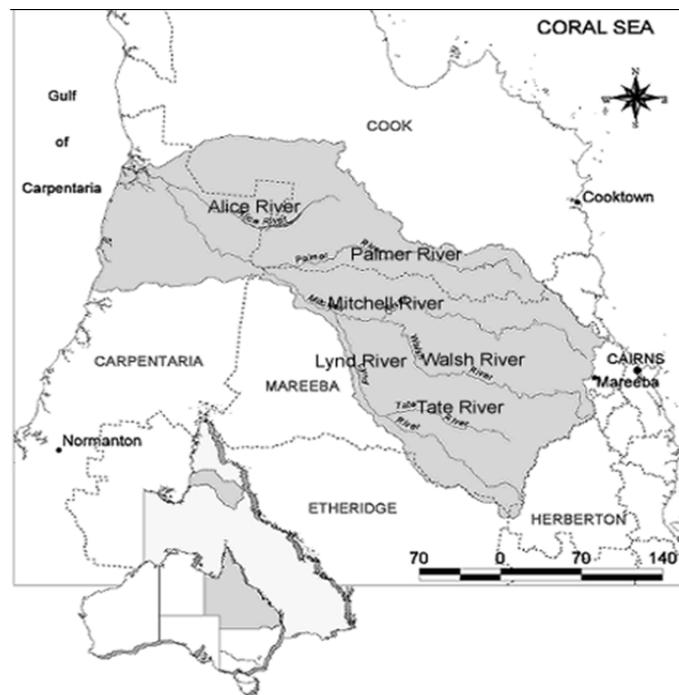
The revised goals and targets represented in this document have been formulated with the guidance of the Mitchell River Watershed Management Group Inc committee, staff and members, as well as the broader community of the catchment and external stakeholders.

## THE MITCHELL WATERSHED

The Mitchell River catchment in Tropical North Queensland, Australia, spans 72,000 square kilometres (the size of Tasmania) across the base of Cape York Peninsula. It incorporates five major river systems: the Mitchell, Alice, Palmer, Walsh and Lynd, and involves four local governments; namely *Tablelands Regional (formerly Mareeba)*, *Cook*, *Carpentaria* and *Kowanyama Communities Local Government Area*. The Mitchell River Watershed Management Group Inc (MRWWMG) arose out of a conference on watershed management held at Kowanyama in 1990. The catalyst for this conference was the concern for the river's health felt by the Traditional Owners when they first started flying to Cairns and saw the catchment from the air. The MRWWMG, has grown into an independent, not-for-profit organisation working in partnership with local communities and stakeholders to:

- create a balanced approach to the use of the catchments resources; and
- achieve sustainable and integrated management of the Mitchell River catchment area.

Figure 1 Map of the Mitchell River Watershed



## HISTORY

The main reason Europeans moved into the Mitchell River Catchment area in the late 1800s was mining, in particular gold. There were numerous battles between the Aboriginal peoples and the Europeans and this is reflected in the names of many localities, such as Battlecamp Road. Once the miners moved into an area there was an associated increase in demand for support services such as food provision. This therefore meant that graziers would follow the miners into a new area to provide this service, resulting in the use of the land for agriculture.

## ACTIVITIES

Grazing remains the most extensive land use in the catchment area whilst mining activities are making a resurgence due to high base metal prices. The Mareeba Dimbulah Irrigation Scheme established in the 1950's has also made the upper catchment of the Mitchell and Walsh Rivers viable for agriculture, horticulture and small scale cattle fattening projects. Furthermore, tourism and fishing have risen in prominence in recent years.

The Mitchell River Catchment area consists of mainly large grazing leases, although the exceptions to this are the Kowanyama Aboriginal Community DOGIT (Deed Of Grant In Trust) and the freehold areas of Southedge Station, part of Wrotham Park Station and many smaller blocks in the East of the catchment. Indigenous people own several holdings in the catchment, including Kondaparinga, Bulimba, Bonny Glen, Oriners, Powis and Sefton.

The Catchment area also contains the following National Parks:

- Hann Tableland National Park
- Errk Oykgangand National Park (formerly Mitchell Alice Rivers National Park)
- Chillagoe-Mungana Caves National Park
- Part of Bulleringa National Park to the South
- Most of the 40 Mile Scrub National Park

## CLIMATE

The climate is tropical and monsoonal with ninety-five percent of the mean annual rainfall of between 800 mm and 2000 mm occurring from November to April. The Mitchell Catchment is the largest watershed in Queensland in terms of average annual run-off, with a mean discharge of nearly 12,000,000 megalitres.

## FAUNA & FLORA

The vegetation in the Mitchell River Catchment area ranges from the World Heritage Wet Tropic rainforest on the eastern highlands to the open savannah on the western and lower Mitchell plains. The extensive mangroves and lagoon systems at the delta of the Mitchell River are recognised worldwide. The permanent waters in the upper catchment are associated with springs and water holes and much of the catchment overlays the Great Artesian Groundwater Province.

Few comprehensive biological and ecological studies have been undertaken in the catchment area to date. However, thirty two species of plants and animal are classified as critically or highly endangered. The inshore islands of the Gulf of Carpentaria also harbour a rich variety of marine life, including turtles and dugong. The Mitchell River, though poorly studied, may possibly contain the most ecologically diverse aquatic system in the country, reflecting the rich variety of habitats in a large river system with wet tropics, dry tropics and monsoonal influences.

## BIO-PHYSICAL ASPECTS

The Mitchell River catchment has some of its headwaters in the Wet Tropics bioregion, and then occupies an area across the Einasleigh Uplands and Gulf Plains bioregions with part of the northwestern section of the catchment in the Cape York bioregion. The river and its tributaries have long been carving through the rough and weathered highlands in the east of the catchment, depositing sediments on the broad flood plains and wetlands of the Gulf Savannah.

The annual monsoonal wet season provides a pulse of water that links the terrestrial and marine environments, whilst transporting sediments, organic matter, and, unfortunately, chemical residues from agriculture and mining in the upper catchment out to the Gulf. It is this seasonal pulse of water that provides the major interaction between different resource uses, as well as connecting the various ecological communities within the Mitchell River Catchment. It also allows for the migration of many plants and animals, both native and feral, whether a beneficial or a nuisance species, as well as shaping the land, realigning river channels and moving and reshaping dry season pools.

The Mitchell River Catchment are also contains tropical rainforest, wet sclerophyll forest, a variety of woodland types, savannah, tidal plains, as well as extensive wetlands, estuaries, and mangroves.

### EASTERN HIGHLANDS

The landforms in the Eastern Highlands are dominated by hills and mountains of sedimentary and metamorphic rock with numerous creeks and seasonal drainage systems making very rugged *country*.

### CENTRAL UPLANDS

This region is mostly undulating country, underlain by metamorphic and granitic rocks. Rock outcrops of a similar but older type also occur in a belt throughout the centre of the area.

### WESTERN PLAINS

These plains form the bridge between the high country to the east and the floodplains to the west with a thick bed of sediments laid down in the Tertiary period dominating the area.

### LOWER MITCHELL PLAINS

This is a huge floodplain which includes virtually the whole area where the main tributaries join the Mitchell River. It consists of alluvial sands, silts and clays; which have collected near sea level. The lower Mitchell plains and western plains are made up of very fragile soils that, despite having minimal slopes, erode readily and contribute the bulk of the annual sediment load from the catchment.

### COASTAL PLAINS

These occupy a small area along the coast of the Gulf of Carpentaria and consist of recently deposited marine and land sourced clays and sands.

## MANAGEMENT ISSUES

The following management issues were identified in the Mitchell River Watershed Management Plan 2000. The issues twelve years later remain virtually unchanged.

## WATER QUALITY

The Mitchell River Catchment is a very large area affected by the monsoonal wet and dry seasons. In the dry season many rivers cease to flow, which highlights the ecological and agricultural value of, and the need for management of, perennial creeks and waterholes in the catchment. Part of the Mareeba-Dimbulah Irrigation Area is within the Mitchell River Catchment and receives water from both Lake Tinaroo and the Walsh River. Of increasing concern is that the pest fish Tilapia could escape from Lake Tinaroo and make its way into the Mitchell River Catchment. This pest could severely impact on the environment as well as recreational and commercial fishing industries in the Gulf of Carpentaria. Tilapia exclusion screens have been installed near

Walkamin in the main Walsh Bluff irrigation channel to minimise the risk of this happening. The intensification of agricultural crops in the irrigation area coupled with inappropriate irrigation practices could also impact on water issues in the catchment.

## LAND DEGRADATION

There are many forms of land degradation, but the most common in the Mitchell River Catchment is accelerated erosion as much of the area has very fragile soils with low fertility and minimal groundcover. These areas erode readily if the surface vegetation is disturbed by either natural events, such as flooding and associated streambank and gully erosion, or loss of groundcover and erosion caused by unsustainable grazing pressure and the associated spread of weeds.

## WEEDS

A wide range of weeds, with both economic and environmental implications, have gained a foothold in the Mitchell River Catchment. Rubbervine was considered to be the greatest threat to large areas of the catchment, but is being displaced by bellyache bush (*Jatropha gossypifolia*) in two known areas. Bellyache bush is a weed species from tropical America that blankets out native species, most parts of it are poisonous and it has killed cattle eating it in the absence of other feed. Prickly Acacia, Chinese Apple, Parkinsonia, Giant Rats Tail Grass, Gamba Grass, Hymenachne and many other pest plants are also commonly found in the catchment. Aquatic weeds such as Salvinia, Water Hyacinth and Cumbungi are also threats to the Mitchell's waterways and aquatic ecosystems. There is a need for improved coordination and cooperation amongst the community to control and manage these weeds.

## NATURE CONSERVATION

The Mitchell River Watershed is home to a large diversity of flora including rainforest, eucalypt forest and woodland, savannah, wetlands, dunes and mangroves. Only some areas of the catchment have been intensively studied, and there is little recorded information on much of it to use in catchment planning. There is a sizeable reserve of protected areas in the catchment and the Wet Tropics World Heritage Area fringes the catchment in the Eastern highlands. The Errk Oygangand, Chillagoe/Mungana Caves and the Hann Tableland are all notable National Parks in the Mitchell River Catchment.

Conservation areas cannot be declared everywhere, nor should conservation interests be restricted to parks only. All land management decisions should include consideration of nature conservation aims, incorporating set standards to protect and enhance the existing environmental values and ecosystem services of the land as a functional landscape.

## FIRE MANAGEMENT

Fire in the Mitchell River catchment is an integral part of the ecosystem with most vegetation communities adapted to, and modified by, the frequency of fire. Fire will occur whether lit naturally, accidentally, negligently or deliberately. The vegetation communities of woodland and eucalypt forest are both susceptible and adapted to fire, whilst the climatic conditions of Australia are conducive to the propagation and spread of fire. Firebreaks are a necessity where fire could spread to areas where burning is not wanted. Removal of dead plant material that could fuel a fire and the promotion of green vegetation or the use of fire resistant trees are effective firebreak methods in small acreage areas, especially on sloping land.

Fire frequency is often a question of social response versus safety needs and fire management is for life, property and environment - but which takes precedence is often debated. Recent studies have suggested that hazard reduction burning, whilst reducing the risk of wildfire, may also have a detrimental effect on certain types of vegetation, even creating conditions that may encourage the spread of weed species, with a negative impact on the animals that rely on the suppressed native vegetation as feed or habitat.

## INTENSIVE AGRICULTURE

Although intensive agriculture is a commercially significant land use in the Mitchell River catchment, it represents less than two percent of the total catchment area. It is mainly limited to the Upper Walsh portion of the Mareeba-Dimbulah Irrigation Areas (MDIA) and the Upper Mitchell Catchment north of Mareeba at Biboohra, Julatten and Maryfarms.

Intensive agriculture can impact on its surrounding environment and downstream waterways in several ways. Land clearing, for example, can sometimes increase erosion and reduce wildlife habitat and cause changes to catchment hydrology through water extraction, changes in vegetation cover, and the addition of irrigation water. Potential also exists for serious environmental damage to water quality and aquatic ecosystems through poor management of farm chemicals and fertilisers.

Many of these potential impacts can be reduced through sound planning and developing the capability to recognise and address a variety of management needs to protect and enhance the existing environmental values and ecosystem services of the catchment.

## GRAZING MANAGEMENT

Grazing is the most extensive land use in the catchment and properties tend to be large, with low intensity management. Much of the grazing lands in the Mitchell are nutrient poor and soil fertility is greatest on river frontages and floodplains, making these areas of high value, both to graziers and for their biodiversity and ecosystem services. A key element of sustainable land use could be to consider grazing on river banks and flats as a last resort in hard times, as their continual use can too readily degrade these key areas of the aquatic ecosystem. The environmental impacts of grazing in the Mitchell cannot be attributed to any single factor and cattle are attracted to virtually all permanent waters in the Mitchell.

Pasture, ground cover and fuel loading can decline over large areas due to grazing pressure and in turn these can be contributing factors to weed and land degradation problems. Road and track networks to service the industry can often lead to erosion problems. Many of these issues can only be addressed in the context of property management planning that considers not only stock management needs but also sustainable land use and maintenance of the existing environmental values and ecosystem services of the land.

## FISHERIES MANAGEMENT

The Mitchell River is a rich fisheries resource and valued species for commercial and recreational fishing found in this catchment include barramundi, salmon, grunter and crab. The Coleman River and North Mitchell River are also nursery grounds for commercially fished prawn species, particularly the banana prawn. The Mitchell River provides an important and varied food resource for indigenous people as well as making a significant contribution to the development of the commercial fishing industry in Karumba. A growing number of recreational fishermen are also now sharing in the fishery resources of the Mitchell River Catchment area.

These fishery resources could be under threat from the pest fish Tilapia if it establishes itself in the Mitchell River Catchment. There has also been little information gathered for sound management of the Mitchell's fisheries. Necessary fisheries management information should include reports on sustainable fisheries harvest, requirements that would require studies of the various fish populations and their respective abilities to sustain specific harvest levels.

## FERAL ANIMALS

Several feral animal species now make their home in the Mitchell River Catchment area and includes pigs, cane toads, horses, cats, dogs & some species of fish. Landholders have a responsibility to control their numbers as some of these feral animals are declared under the Rural Lands Protection Act 1985.

The impacts of feral animals vary between species and the local environment. In selected areas some feral animals have become valued resources, but in most areas feral animals are at best a nuisance and at worst a serious economic and environmental threat. Strategies for feral animal management must consider many factors if they are to be cost effective and worthwhile but without baseline information, feral animal control strategies are difficult to formulate. Current information on feral animal distribution is sketchy and very poorly documented with biodiversity surveys typically focussing on native species and ignoring feral animals. Collecting systematic information on most feral animal species is difficult because the Mitchell River Catchment is large and sparsely populated by humans, therefore, there is little information available to base any scientific research on.

## TOURISM AND RECREATION

Many areas of the Mitchell River Watershed are used for Tourism and Recreation. From the mouth in the Gulf of Carpentaria to the mountain ranges of the Wet Tropics, the catchment is under increasing pressure from recreational activities. Many of these activities occur on land that is not designated or supported for tourism and recreational use.

The access provided by four-wheel drives, trail bikes and quad bikes to previously inaccessible areas of the catchment has created an increasingly popular recreational use that is particularly difficult to manage. Four-wheel drive campervans offer self-contained travel, often producing little economic benefit to areas being visited. Road improvements on the Cape and Burke Developmental Roads are now allowing greater numbers of people in standard vehicles to access the catchment. Management problems including fires, rubbish, access disputes, weed dispersion, water pollution and site impacts from camping and rest areas (commonly in riparian zones), and public safety issues and will ultimately increase as visitor numbers rise.

Access to the recreational resources of the Mitchell is important to a large, but hard to identify, segment of catchment stakeholders and land use and management planning must recognise and account for this.

## MINING

Mining is a significant industry in the Mitchell River catchment. It is the oldest non-aboriginal land use in the catchment, being a significant activity in the region for more than 120 years. However, with the benefits have come some costs. The social cost of early mining operations is highlighted by boom-and-bust towns, such as Maytown, Irvinebank and Chillagoe, the battles between the aboriginal peoples and the miners on many goldfields, and the mine explosion disaster at Mt Mulligan Mine.

Despite early setbacks, not the least of these being the remoteness of much of the region, mining has flourished and remains a significant industry in some areas of the catchment. Small scale alluvial and hardrock gold and tin operations have dominated mining activities in recent times. However, the recent commodities boom with increases in prices for some metals (e.g. tungsten) have led to an increased interest in other mineral deposits and large-scale mining may commence, or recommence, in some parts of the catchment. Exploration for new minerals, including uranium, rare earths and mineral sands, has also increased significantly in the catchment in the first decade of the 21<sup>st</sup> century.

Historic mining and mineral processing sites may have many special land management issues due to the presence of site contamination from mining residues and other pollutants. The condition of these sites is the result of an era in which winning minerals was paramount and environmental damage was not a consideration. Whilst such environmental damage would never be acceptable today, historic mining works are an important element of the cultural history of many communities. The reworking of some of these old mining areas with more efficient mineral recovery methods offers an opportunity to cost effectively clean up the toxic residues left behind in some historic mining areas.

## CULTURAL HERITAGE

Cultural heritage (both European and Aboriginal) can be a deeply emotive issue that provides knowledge of our ancestry and a sense of belonging for many people. Cultures have clashed violently in the Mitchell River Catchment area in the past, but planning for a sustainable future for the catchment can only be based on mutual recognition of, and respect for, the values, especially environmental and cultural, of all the communities living in the area. There are many documented heritage sites within the catchment and the non-indigenous sites are mostly found within and around old mining centres, such as Chillagoe, Irvinebank, Mt Carbine and Maytown.

Most of the formally recorded Aboriginal sites also occur near these mining centres and include shelters, rock art and utilitarian evidence of indigenous inhabitants. One cave on Ngarrabullgan (Mt Mulligan) contains archaeological evidence of over 37,000 years of Aboriginal occupation. The distribution of recorded Aboriginal sites near mining centres perhaps reflects the fact that discovery of sites by Europeans is more likely to have occurred around areas of intensive European activity. No doubt many more sites exist unrecorded, and maybe even unknown, in areas cleared of their aboriginal peoples by miners and graziers. Cooperative management provides the best avenue to ensure that all cultural heritage is retained. Information about local cultural heritage is being collected and children are being involved in school programs to ensure the passing on of this information.

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Ngarrabullgan (Mt Mulligan) – a site with 40,000+ years of indigenous occupation and 160 years of white history

## REVIEW OF THE MITCHELL RIVER WATERSHED MANAGEMENT PLAN

The Mitchell River Watershed Management Plan created in 2000 was updated in 2012. The information below is a collation of the outcomes of the Mitchell River Watershed Workshop held on the 12<sup>th</sup> and 13<sup>th</sup> March at Mareeba. It records the recommendations of participants (from the butchers sheets, individual comment sheets and recording of the workshop) on revision of the original goals (2012) and how to achieve those goals grouped under the following headings:

- Awareness and communication
- Research
- Implementation
- Resourcing
- Collaboration
- Monitoring and Evaluation

In addition to the goals and tasks listed below, there were several comments from participants that span across all theme areas, and should be kept in mind when prioritising works for the catchment. These overarching comments are listed below:

- Expand the membership of the Mitchell River Watershed Management Group to include all stakeholders who reside in the catchment and all relevant external stakeholders
- Continue to work closely and collaborate with Northern Gulf Resource Management and Cape York Natural Resource Management as valued partners.
- Ensure monitoring is done with a purpose, to evaluate the effectiveness of actions Use ambassadors (local people) to coordinate and funnel information (all goals)
- Investigate the effectiveness of developing sub-catchment or sub-regional plans
- Think about ways to reach the younger generation
- Consider estimating the cost of 'no action' as an argument for funding
- Consider across all goals ways to effectively involve and employ Traditional Owners to work on country

### Vision

***'The management of the Mitchell River Watershed will be an example of issues addressed proactively.***

***It will be a place where environmental, cultural and socio-economic values are appreciated and understood to protect the unique qualities of the catchment.***

***It will foster cooperative management and goodwill between stakeholders and across boundaries, and emphasise a sense of community ownership'***

## Goals and Major Tasks

### MINING REHABILITATION

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**Goal:** Environmental harm from past, present and future mine sites is minimised by implementing best management practice and technologies and ensuring effective, progressive and closure rehabilitation

#### ***Awareness and Communication***

- Design and implement a communication plan for miners, NRM bodies, landowners, Traditional Owners and Local Government to inform and share knowledge about potential downstream impacts from mining and new amelioration techniques
- Design suitable training and extension materials to support the communications plan

#### ***Research***

- Identify and quantify the hazards (both environmental and to public safety) for the estimated 3000 old mining sites and prioritise for rehabilitation, including danger to groundwater.
- Investigate and research new technologies for mine rehabilitation and develop trial sites

#### ***Implementation***

- Work with Government Agencies to design strategies that ensure environmental planning is in place for duration of a mines life, and better management of mine closure process.
- Create a taskforce for rehabilitation of old mine sites, and develop rehabilitation plans (an Abandoned Mine Site Management Strategy) for identified sites based on site data, best practice and cost
- Develop a plan for Traditional Owners to work with mines to develop rehabilitation plans
- Develop uniform regulatory controls for extractive industries

#### ***Resourcing***

- Develop a funding program to implement prioritised plans by advocating for Government support and investigating other options such as sponsorship, direct use of bonds, tax reductions, carbon credits and market based instruments

#### ***Collaboration***

- Develop a partnership plan with mining companies, Traditional Owners, landholders, community and Federal, State and Local Government to develop information for a database and to assist with implementation

#### ***Monitoring and Evaluation***

- Design and implement a monitoring and evaluation plan to measure effectiveness of actions

### TOURISM AND RECREATION

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**Goal:** A sustainable tourism and recreational industry that maintains the natural integrity of the catchment.

#### ***Awareness and Communication***

- Develop a green tourism program which promotes understanding of the catchment and encourages involvement in NRM and which utilises grey nomad online sites and other mechanisms to engage with tourists

#### ***Research***

- Research the current and projected tourist numbers, likely locations, and liability for land managers
- Research the extent of State Crown reserves and the potential for infrastructure for tourists to be located at these sites to reduce landholder liability

#### ***Implementation***

- Agree on the scale and locations for tourism desired for the catchment through consultation with landowners, Traditional Owners, State Govt, tourism operators, Regional Councils

- Develop a tourism plan for identified locations which looks at information and signage, liability, infrastructure requirements, costs and maintenance, ease of implementation (paperwork) and which utilises the green tourist plan
- Develop case studies eg Kowanyama to inform best practice

#### **Resourcing**

- Develop sustainable funding programs to allow implementation of actions

#### **Collaboration**

- Facilitate working group to include key stakeholders such as State Govt, tourism operators, Traditional Owners, landowners, Regional Councils to oversee project

#### **Monitoring and Evaluation**

- Develop and implement a monitoring and evaluation program to measure effectiveness of actions

## GRAZING

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**Goal:** A sustainable, productive grazing industry, which uses best management practice and integrates environmental, economic and cultural values

#### **Awareness and Communication**

- Develop and implement the most effective ways for information transfer to graziers through consultation with landowners and managers, NRM Groups and DAFF

#### **Research**

- Work with research institutions and NRM Groups to suggest innovative research areas such as:
  - Effect of clearing some areas for hay production to reduce erosion
  - Management of land through National Parks vs graziers
  - Opportunities for carbon sequestration
  - Soil mapping classification and suitability for grazing
- Ensure link between research findings and land managers

#### **Implementation**

- Assess uptake and effectiveness of current programs such as Savannah Plan (Local Consensus Data Group, Futureprofit) which support Property Planning and best practice grazing land management and include:
  - Stocking rates, pasture management, paddock rotation
  - Fodder crops, nutrient management
  - Diversification eg cattle breed, tourism
  - Fencing, watering points and water management
  - Fire management and weed and feral animal control
 and develop and implement recommendations to assist graziers achieve best practice and profitability
- Assess cultural values as part of property planning and facilitate management of sites
- Develop a plan to assist graziers with onsite extension services and hosting of field days
- Develop and implement ways to keep local expertise on the land through providing young people with education and accreditation

#### **Resourcing**

- Investigate incentives for graziers who practice good stewardship in terms of lease extension (Delbessie Agreement) ongoing grants or return from carbon sequestration.
- Assess accreditation programs for graziers implementing best practice which could provide premium price for beef (indicators of sustainability)

#### **Collaboration**

- Develop networking opportunities for graziers, and use local skilled, accredited people to assist others (peer to peer)
- Develop a mentoring program with well financed high achievers helping smaller landowners with less resources
- Ensure strong partnerships and alignment with NRM Groups, DAFF

#### **Monitoring and Evaluation**

Design and implement a monitoring and evaluation program to measure effectiveness, include auditing of accreditation programs

## FIRE MANAGEMENT

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**Goal:** A fire management system that is consistent with the other goals for the Mitchell River Watershed, with collaboration across all land managers and owners to incorporate best practice fire planning and monitoring

### ***Awareness and Communication***

- Design communication and education plan (include promotion of NAFI) for land managers and visitors about the role of fire in the landscape and the need to use it with care and with a clear purpose

### ***Research***

- Research interaction of fire management with carbon sequestration and resourcing of fire plans
- Research or document role of fires lit by visitors to the watershed to determine scale of issue
- Research potential benefits of legislation and penalties in fire management

### ***Implementation***

- Reach agreement on who should document best management practice for fire and document for 5 bioregions of Mitchell River Watershed.
- Develop fire management plans ensuring appropriate scaling across watershed, sub-catchments and property scale in partnership with stakeholders, ensuring that all impacts are considered (pasture, biodiversity, land degradation, weeds) and that the plans have a clear purpose for all burns.
- Incorporate Traditional and other local knowledge into plans and allow for review period for plans which looks at changes in weather patterns.
- Implement plans with a coordinated approach which includes all stakeholders in an advisory group, including pre season fire meetings

### ***Resourcing***

- Develop a resourcing plan to ensure sufficient funding is available for fire equipment and support, and for the Rural Fire Service

### ***Collaboration***

- Develop an approach to fire planning which is driven by the local community, using local and traditional knowledge and expert advice, and involves all stakeholders

### ***Monitoring and Evaluation***

- Advocate for additional funding for NAFI to monitor results of fire planning.

### ***Awareness and Communication***

- Design communication and education plan (include promotion of NAFI) for land managers and visitors about the role of fire in the landscape and the need to use it with care and with a clear purpose

## NATURE CONSERVATION

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**Goal:** Ecological diversity is managed, maintained and conserved by recognising people as part of biodiversity and enabling support to land managers to implement best practice management

### ***Awareness and Communication***

- Develop a communication plan which defines key stakeholders and provides a thorough education and understanding of the biological and ecological diversity of the catchment and highlights the links between productivity, sustainability and ecological diversity

### ***Research***

- Collate current sources of information on biodiversity in the catchment from Government, research institutions, NGO's, TO's, NRM Groups and local community and identify gaps in knowledge
- Do an accurate assessment of the biodiversity of the catchment through mapping, surveys, data collection and monitoring based on the identified gaps
- Identify the key threats to biodiversity

### ***Implementation***

- Use Traditional knowledge in biodiversity management,

and provide for them to access country for cultural and management reasons where indigenous traditional landholding groups no longer hold tenure. Provide support for Indigenous Groups to manage biodiversity, recognising their diversity in organisational capacity and land tenure

- Employ extension officers to assist landholders with managing their biodiversity, and investigate the use of mentors
- Ensure property plans and grazing land management includes biodiversity management
- Develop a prioritised plan to manage biodiversity in the catchment, and integrate with property plans and grazing land management (Identify and protect critical dry season wildlife refuges and corridors)

**Resourcing**

- Develop mechanisms to fund field work, management and maintenance of biodiversity as prioritised in the biodiversity plan. Consider a range of incentives for stewardship modelled on the Reef Rescue package

**Collaboration**

- Develop partnerships between all major stakeholders (Federal and State government, Regional Councils, Utilities, NRM Groups, Traditional Owners, miners, graziers, community) to pool resources, align effort and get on-ground involvement according to the biodiversity plan.

**Monitoring and Evaluation**

- Identify monitoring requirements to gauge success of implementation of the biodiversity plan, and conduct and maintain a dynamic coordinated, assessment of biodiversity in the catchment, using community monitoring where possible.

## FISHERIES MANAGEMENT

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**Goal:** Healthy fisheries maintained through educated management decisions

**Awareness and Communication**

- Develop information for community on collection of material after fish kills to help determine the cause

**Research**

- Clearly identify any threats to recreational and commercial fisheries including aquatic pest species (eg Tilapia, azolla), and include social research with fishermen, marine habitat and debris
- Establish roles and responsibilities for investigating fish deaths

**Implementation**

- Develop a plan to address prioritised, identified threats
- Develop and use successful case studies (eg Kowanyama management of the delta, Tom Ryan's work on sea fish) as models for actions
- Investigate support for Indigenous enterprises based on recreational fishing for tourists

**Resourcing**

- Investigate resourcing from a consortium which includes State Govt, Sunfish, Sun Water, research institutions and the commercial fisheries

**Collaboration**

- Establish partnerships across a range of stakeholders (Traditional Owners, Federal and State Government, recreational and commercial fisheries, research institutions and community) to ensure adequate resourcing and alignment of effort.

**Monitoring and Evaluation**

- Establish base line data with appropriate ongoing monitoring, and investigate reinstating status of catch numbers

**Goal:** Weed and feral animal infestations are significantly decreased through identifying, prioritising and managing weed and animal pests using best practice control methods

### ***Awareness and Communication***

- Develop an education strategy with key stakeholders to provide information to all stakeholders in the catchment and visitors on weed identification, spread and control methods, including identification of emerging weed problems
- Develop education and awareness program of the social, cultural and environmental impact of feral animals, including the risk of transmitting disease

### ***Research***

- Check weed mapping and feral animal data at Regional Council level, and help fill any gaps or need for ground truthing
- Evaluate current data on feral animal and weed impact and control methods through Local Government and others, and assist to fill any knowledge gaps

### ***Implementation***

- Partner with key stakeholders to use data to prioritise target feral animal species (and where necessary some native species) and develop individual innovative long term management plans with realistic targets for control
- Ensure cost effective early intervention on emerging threats (eg Tilapia)
- Work with Regional Councils, State Agencies and landholders to get agreement on top 5 weeds and develop management plans that provide integrated outcomes at a Watershed, Local Government and property scale
- Use property planning to implement agreed weed management plans in an integrated cooperative approach using a range of appropriate methods (including fire)
- Evaluate the current wash down facilities across the catchment for cost effectiveness and scale, and develop strategies to improve if required.
- Evaluate feasibility of other options to reduce weed spread, including pig control, fencing for cattle and penalties for weed spread

### ***Resourcing***

- Develop attainable costed actions from management plans for weeds and feral animals and develop a resourcing plan for long term funding
- Ensure contingency funding is available for new weed and pest animal infestations to allow prompt action and reduce long term costs
- Develop funding mechanisms and lobby as a united voice for long term funding programs to allow effective implementation of actions
- Investigate new and innovative ways of resourcing control programs using bounties and other stakeholders such as Australian Shooters Association

### ***Collaboration***

- Ensure collaboration between key stakeholders such as Local Government, State Agencies and landowners
- Establish mechanisms for cooperative management of weeds that ensures all key stakeholders are working together to align effort (eg Main Roads, Ergon Energy, Telstra etc)
- Create taskforce to deal with new and emerging weeds

### ***Monitoring and Evaluation***

- Develop a voluntary weed reporting and surveying network to report on effectiveness of actions and new weed outbreaks to an agreed website
- Evaluate effectiveness of implementation and review priorities annually

## LAND DEGRADATION

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**Goal:** Land degradation is reduced through good land use planning, use of best management practice and rehabilitation of degraded areas

### ***Awareness and Communication***

- Develop a communication program to provide information to land managers on best practice for overgrazing, prospecting, fire management and road construction to reduce land degradation
- Provide opportunities for field days and workshops to look at trial sites
- Provide publicly accessible information on soil types and their suitability for particular management practices

### ***Research***

- Research erosion by looking at sediment to determine causes
- Trial a variety of methods of erosion control to determine effectiveness, including ways to slow water down and findings from TRaCK research
- Identify problem soils and their extent in the catchment

### ***Implementation***

- Use property plans to implement best practice for overgrazing, fires, riparian management and road construction to reduce land degradation, informed by land suitability, problem soils and research findings
- Partner with Local Government to implement better stabilisation of roadworks

### ***Resourcing***

- Develop a funding strategy to assist landowners with land degradation reduction, and research possible incentives program

### ***Collaboration***

- Develop partnerships with Local Government, landowners, State Agencies and research organisations to implement good grazing practice

### ***Monitoring and Evaluation***

- Develop a monitoring and evaluation program for the progress and identify technologies in other organisations which could be used to assist the program

## CULTURAL HERITAGE

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**Goal:** Cultural Heritage is preserved and protected, including history, artefacts, stories and sites

### ***Awareness and Communication***

- Develop a plan to promote and improve awareness of the history and heritage values in the Mitchell River watershed

### ***Research***

- Identify and map all significant cultural sites both past and present

### ***Implementation***

- Plan how identified sites can be protected and maintained at a property scale, develop collaborative agreements between relevant parties (including land and sea managers) about their use.
- Record and preserve oral and written histories of heritage, both indigenous and non-indigenous

### ***Resourcing***

- Once sites are identified and planning complete, advocate for funding for implementation of protection of heritage sites

### ***Collaboration***

- Establish representative groups with all key stakeholders and plan and implement appropriate heritage protection

### ***Monitoring and Evaluation***

- Develop a monitoring and evaluation program to evaluate progress and effectiveness

## WATER QUALITY AND QUANTITY

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**Goal:** To restore and maintain the quality and quantity of surface and groundwater to a standard acceptable to ecological and human health as well as for sustainable industry

### **Awareness and Communication**

- Increase community understanding of soil types and impacts on water quality and quantity, groundwater systems, and natural /human impacts on water quality
- Provide easy access to water quality and quantity data
- Document and disseminate local and Traditional knowledge of catchment hydrology

### **Research**

- Research any gaps in catchment hydrology, including how the catchment hydrology has been influenced by existing land uses.
- Research environmental water needs for ecosystem health, and needs for industry, agriculture and human use
- Research a range of options for water efficiency options, including onstream vs offstream storage.
- Define what acceptable water quality parameters mean

### **Implementation**

- Support the actions for best practice for agriculture, mining and land degradation to protect water quality
- Develop a reporting and response mechanism for community who identify water quality issues
- Develop a plan for water management in the watershed and promote implementation of identified water efficiency measures, including recharge bores
- Work with Sunwater and intensive horticulture growers to look at impacts of growers having to use full water allocation

### **Resourcing**

- Work with industry to maximise returns to enable investment in best practice (eg overland flow dams), and provide subsidies as an incentive to increase uptake.
- Advocate with other partners for a local Water Quality laboratory

### **Collaboration**

- Assist networking amongst groups to share water quality and quantity knowledge, and to use the knowledge to make informed comment about industry type and location on the river system

### **Monitoring and Evaluation**

- Develop a comprehensive water quality monitoring program to identify sources of contamination and natural/human impacts

## INTENSIVE AGRICULTURE

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**Goal:** A diverse, adaptive, sustainable and economically viable agricultural industry which uses best practice to minimise environmental harm

### **Awareness and Communication**

- Work with industry groups to encourage cross industry communications on best practice and potential future impacts on climate and costs, and investigate information transfer via a web site
- Assist growers with property management through extension officers for site visits

### **Research**

- Research feasible options for water recycling for growers
- Research impacts on food security if local industries close.
- Compile agricultural land suitability information for the Mitchell River Catchment

### **Implementation**

- Work with industry to provide appropriate training in best practice (including erosion control, contour farming, riparian management and water recycling) , new research and technologies and their onground implementation (investigate reef rescue scheme extension)
- Create demonstration sites for best practice and conduct field days

- Facilitate initiatives to assist with conflict in mixed land tenure
- Provide options to assist succession planning and training
- Assist the development of property management planning within the agricultural sector which includes land capability mapping

#### **Resourcing**

- Work with industry to maximise returns to enable investment in best practice (eg overland flow dams), and provide subsidies as an incentive to increase uptake

#### **Collaboration**

- Work with industry to assist with building of grower networks for information and support
- Investigate how best to establish or support a working partnership between growers, industry, management agencies and research organisations

#### **Monitoring and Evaluation**

- Develop a monitoring and evaluation program to evaluate effectiveness

## IMPLEMENTATION PROCESS

The goals and tasks identified in this plan have been further workshopped through a series of 10 workshops and phone surveys. This has created a set of activities which stakeholders have prioritised as important to achieve the vision for the watershed. These activities can be found in the MRWVG Business Plan 2013-2016, which will be reviewed bi-annually by the MRWVG. The resourcing of these activities will be from a variety of sources, including the Regional Groups, Federal and State Grants and other sources.

## REVIEW PROCESS

It is important to review Strategic Plans on a regular basis, both to evaluate success against achieving the goals and major tasks, and to consult with stakeholders regarding new priorities. It is envisaged that this plan will be reviewed at the beginning of 2016 with another round of consultation.