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# Fig Tree Creek Masterplan

## Yeppoon, Queensland

**BLACKSMITH**  
PLANNING & DESIGN

DEICKE RICHARDS



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Deicke Richards.

All imagery provided by Stephen Smith.



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# Introduction

“My interest is in the future, because I am going to spend the rest of my life there.”

Charles Kettering

The Fig Tree Creek catchment takes in a large proportion of the Yeppoon township including the town centre. It includes most of the residential areas north west and south west of Yeppoon, and is defined loosely by the Yeppoon Golf Course and Yeppoon Road to the south, Meikleville Hill and Barlows Hill in the north and out to Limestone Creek Road at Inverness in the west.

Fig Tree Creek provides a range of recreational, social and environmental benefits. It is a place for recreational activity from boating to fishing and walking and is an important part of the region. The lower catchment is an environmental reserve, providing important breeding, feeding and nesting point for many native fauna. Ross and Fig Tree Creeks are an important part of the tourism industry that exists in the Capricorn Region.

The majority of the catchment has been highly urbanised however bringing a number of issues including:

- Extremely narrow and poorly defined creek channel through existing urban areas
- Weed infestation
- Poor water quality
- Flooding
- Sediment build up
- Poor physical access
- Poor amenity
- Degraded environmental quality

This has been brought about by a number of factors over the years however chief among them are the previous residential development practices which have created poor urban outcomes in relation to the management of Fig Tree Creek and its management as a water source. This has resulted in the creek being contained in many locations in between back fences.

This type of outcome creates:

- A poor open space network that is not connected and is not able to be connected. This in turn impacts upon ped/cycle connection
- No overlooking or passive surveillance
- Poor flooding and drainage response as any overflow has nowhere to go except into private property and no access to make any alterations, improvements or repairs
- Weed infestation as there is no ability to undertake maintenance of vegetation
- Lack of community stewardship as the creek is at the back of properties and essentially out of mind out of sight.

These residential practices must not be allowed to perpetuate in the upper catchment where further development is contemplated in accordance with the Strategic Framework in the draft planning scheme.

This work will analyse the catchment and then offer a range of potential solutions to some of the issues. Some issues such as the constrained nature of the creek are to a large degree intractable without the wholesale purchasing of some private property adjoining the creek. This is to be avoided however, due to the enormous financial, community and political costs.

But there is still much that can be done to improve the viability of the creek as a source of amenity, habitat and connection. In this regard Council and the community will both play a large part in any future success of the catchment.



# Fig Tree Creek

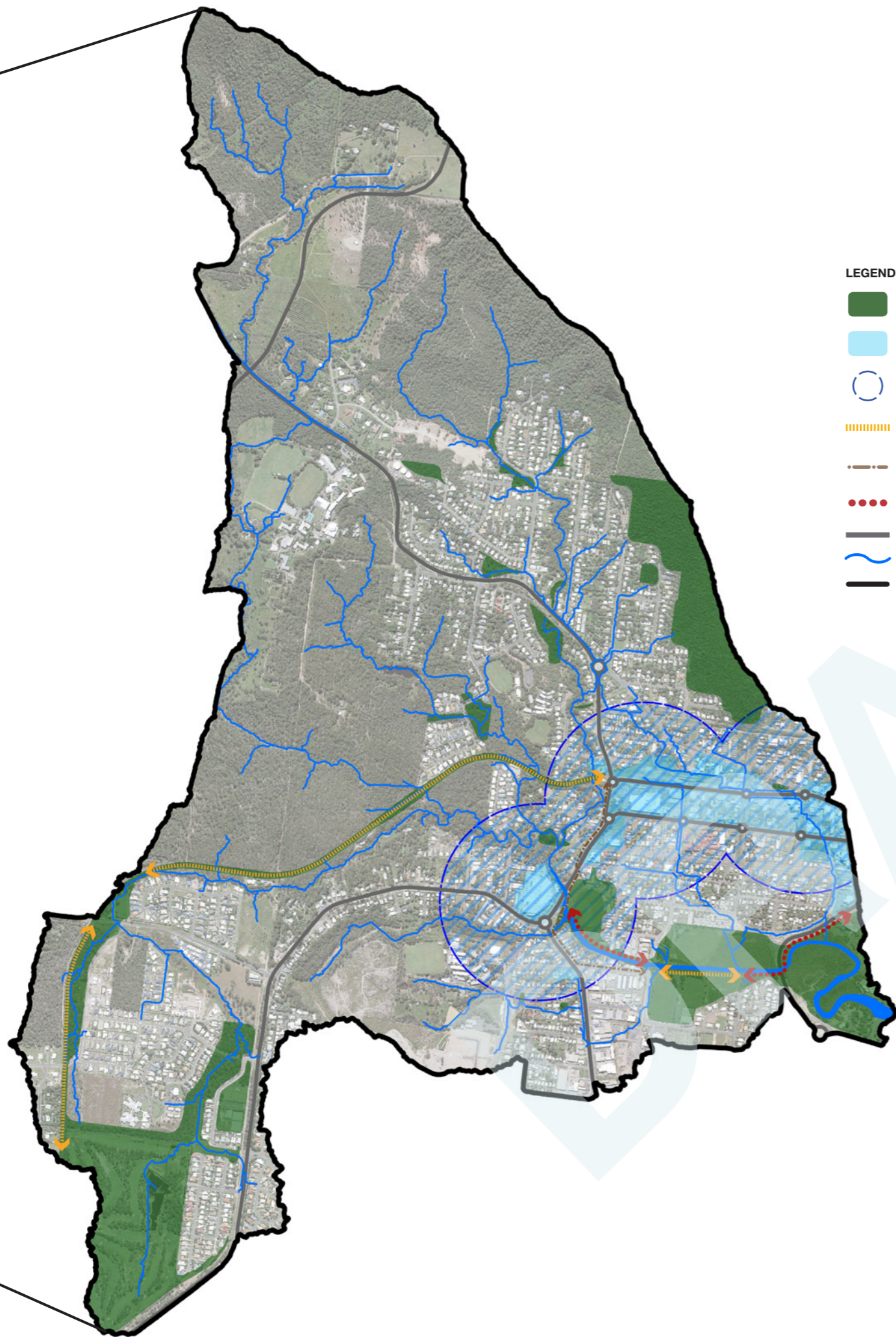
Falling from the higher parts of the catchment at Pacific Heights and Barlows Hill the catchment dominates the urban area within and surrounding Yeppoon as shown in Figures 1 and 2. A number of broader environmental corridors which extend along local ridgelines adjoin the catchment from the north. The Ross Creek catchment adjoins the Fig Tree Creek Catchment to the south and provides additional opportunities for environmental connections. Rural areas dominate land uses to the west.

Figure 3 is the draft Strategic Framework for Council's new planning scheme. This shows some areas of the catchment to the west of the existing urban area that are still to be developed for a range of residential uses. How these areas are developed needs to be carefully considered if there improvements to be made to the health and performance of the catchment

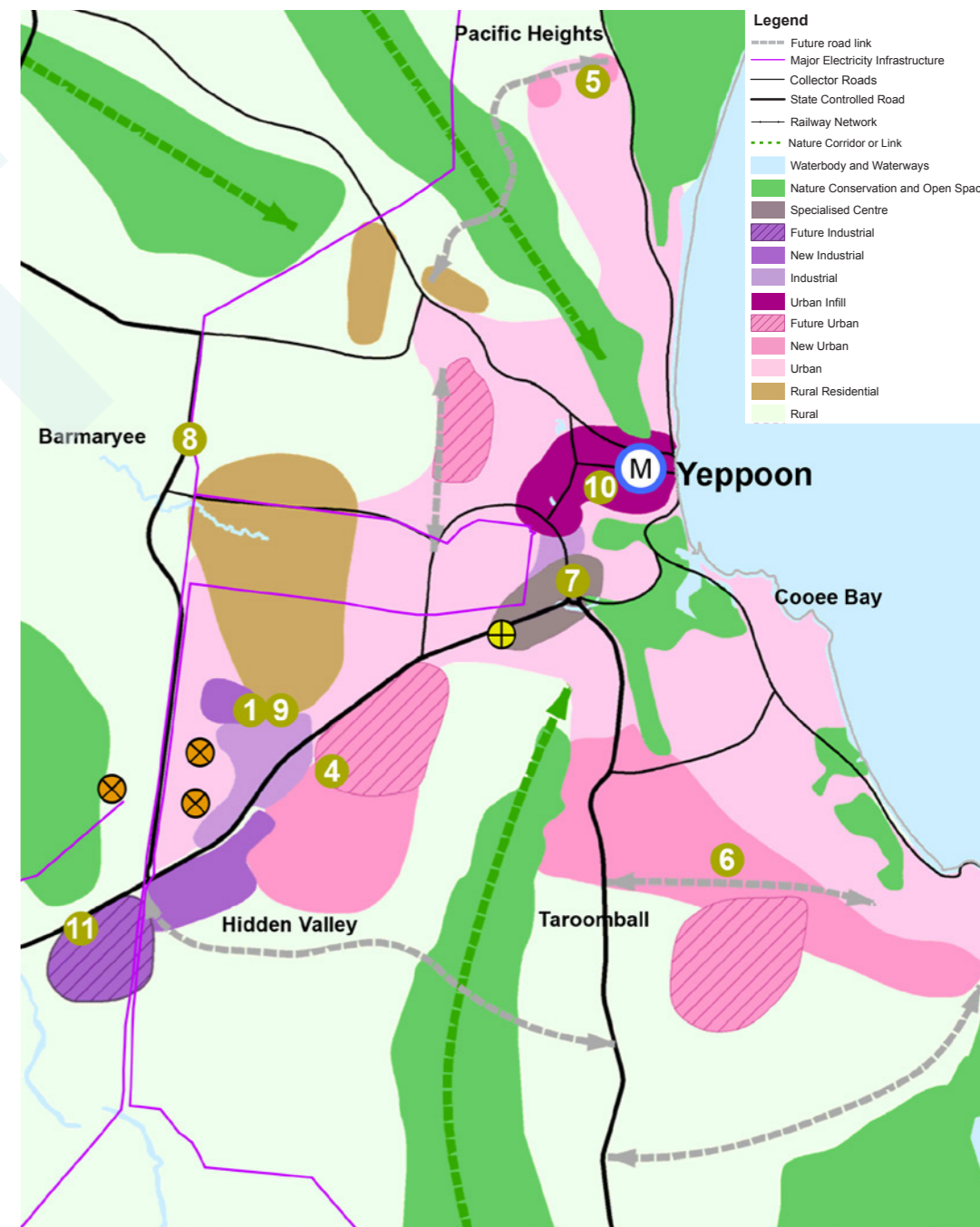


Figure 1 - Fig Tree Creek catchment in relation to Yeppoon and surrounds.





- LEGEND**
- Open space network
  - Town centre
  - 800m distance to centre node
  - Capricorn Coast Pineapple Rail Trail
  - Existing pedestrian connection
  - Missing shared use connection
  - Major roads
  - Fig Tree Creek waterways
  - Catchment Boundary



- Legend**
- Future road link
  - Major Electricity Infrastructure
  - Collector Roads
  - State Controlled Road
  - Railway Network
  - Nature Corridor or Link
  - Waterbody and Waterways
  - Nature Conservation and Open Space
  - Specialised Centre
  - Future Industrial
  - New Industrial
  - Industrial
  - Urban Infill
  - Future Urban
  - New Urban
  - Urban
  - Rural Residential
  - Rural

Figure 3 - Strategic Framework Map (with Fig Tree Creek catchment boundary) - Livingstone Shire Council.

Figure 2 - Fig Tree Creek catchment local context within Yeppoon.

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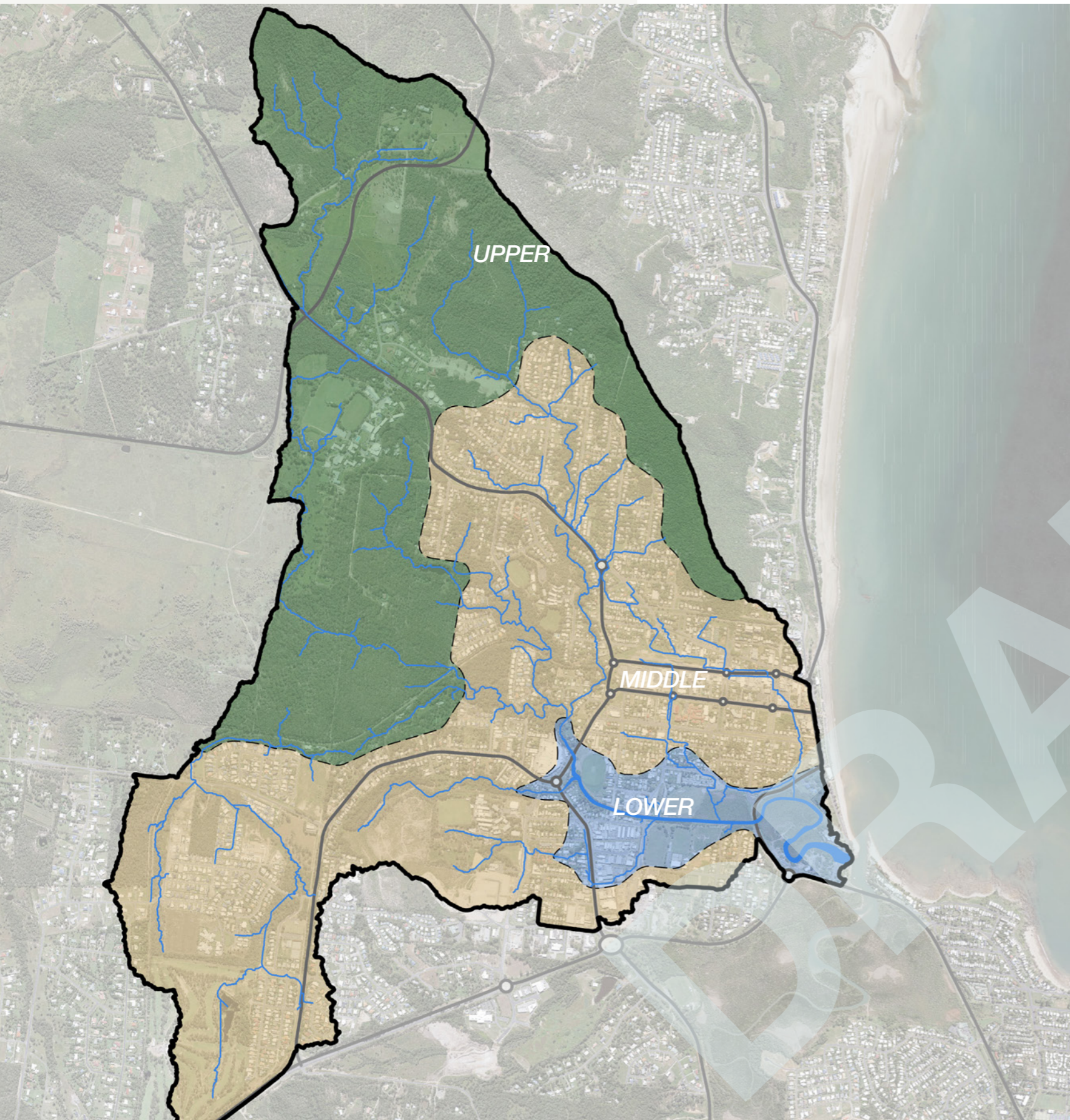


Figure 4 - Fig Tree Creek catchment and sub-catchments within Yeppoon.

## The State of the Catchment

This section provides a more detailed overview of the various parts of Fig Tree Creek. For the purpose of both analysing and providing strategic advice regarding the catchment, it has been broken into three main parts. The catchment has distinct components essentially based on current land uses and extent of urban development. For instance the upper catchment distinguishes itself by having the least amount of urban development at present. The lower catchment is arguably the most environmentally significant containing the tidal range of the Fig Tree Creek and contains significant areas of mangroves and wetlands.



Figure 5 - Areas in the middle catchment overgrown with weeds.



Figure 6 - Sediment build up in Fig Tree Creek.



## Upper Catchment

This is the birthplace of Fig Tree Creek where the quality of the spring waters is the stuff of local legends. This area is essentially those parts of the catchment which have not been developed for urban purposes and includes parts of Inverness, Adelaide Park, Pacific Heights etc. Parts of the upper catchment are designated for Residential or Park Residential purposes and will be developed at some point in the future. Outcomes should seek to achieve more pedestrian and cycle connectivity with other parts of the catchment. Policy responses should reflect appropriate design outcomes that reflect the vision for the catchment.

Other parts are zoned Open Space or Rural and are unlikely to be developed in the near future. Water quality and environmental connections are important outcomes that should be explored these areas.

## Middle Catchment

This includes the majority of the urban areas of Yeppoon. Park Street is the assumed eastern boundary of the middle catchment and represents the point at which fresh water and salt water mix. Essentially this is the tidal range of the creek at present.

The middle catchment is highly developed. Urban development practices have created poor interfaces with the creek. In a number of instances the creek is lost in a jumble of backyards, and private property where the health of the waterways suffers through neglect and poor maintenance. As shown in figures 5 and 6 the creek is in places choked with weeds and sediment build up which impacts on urban drainage and flooding.

A considerable number of weed species can be found in the waterway. These weed species impact on the environmental value of the corridor diminishing its value as a habitat linkages. Because of the location of the creek corridors behind or within private property these waterways are not able to be accessed to perform any remediation works.

Flooding occurs in this part of the catchment due to:

- Interruption of natural water flows by structures such as retaining walls built in the flow path;
- Water velocity has been increased by concrete straightening and creek bank erosion.

Infrastructure works on flood mitigation have concentrated on the lower catchment have been undertaken in an attempt to correct problems originating in the middle and upper catchments. These problems need to be addressed at their origin.

## Lower Catchment

This is the part of Fig Tree Creek which sits to the east of Park Street and represents the tidal range of the creek. The creek in this part of the catchment suffers from bank erosion and stability problems due to the volume and velocity of water entering into this part of the creek. Sediment and erosion controls are absent.

Multiple incremental drainage solutions have been imposed on this part of the catchment over many years. All of which have been directed at solving multiple issues of flooding and drainage, etc. This part of the catchment is very low lying and contains a considerable amount of reclaimed wetland areas for urban development. Indeed, Council's own works depot is contained on reclaimed wetland. Considerable amounts of open space are in this location as well including the Yeppoon Showgrounds and the Capricorn Coast Football Club. Most of these parts are connected by off road cycle links however the linkages are not complete.

Marine vegetation – mangroves etc make for a reasonably pleasant environment to walk next to or simply look at. There are many opportunities in this space to enhance the recreation experience of this part of the catchment, utilise the open space for a range of activities and indeed the creek is wide enough to allow navigation via canoes and kayaks.

In an unpublished management plan dated July 2004 prepared by the Department of Natural Resources and Mines for the Management of Ross and Fig Tree Creeks it noted with respect to the environmental values of the lower catchment:

*The mangrove areas of Ross and Fig Tree Creeks provide a permanent campsite for a large colony (approximately 2000) of black flying fox (Pteropus alecto) and a seasonal camp for several hundred thousand little red flying fox (Pteropus scapulatus). Permanent flying fox camps have high biodiversity value. Black flying foxes use the area during summer as a maternity site. This species is more sedentary than other species of flying fox but may undertake local movements of up to 50km when foraging. There is migration from Ross Creek and Fig Tree Creek to other satellite colonies at Water Park Creek and Emu Park, particularly if flowering/fruitletting is scarce. They feed on nectar (Eucalyptus, Corymbia, Banksia, Melaleuca & Syncarpia spp.) and fruits (Ficus spp.) and cultivated fruit and are considered critically important to the maintenance of healthy forest ecosystems on the central Queensland Coast. The numbers of little red flying foxes camping at Ross and Fig Tree Creeks varies from year to year and has been used as a maternity site.*

*The Ross and Fig Tree Creeks roost is considered important for this species as the loss of daytime roost sites is considered a threatening process for little red flying foxes.*

*Some migratory birds use the area as a roosting and feeding zone and the Japan-Australia Migratory Bird Agreement (JAMBA) and the China-Australia Migratory Bird Agreement (CAMBA) identify the importance of protecting habitats for a range of rare and threatened wader species that frequent the area.*

Elements of a pedestrian and cycle network existing in this part of the catchment. This area is reasonably flat or gently undulating and is an ideal place to be promoting walking and cycling to access local activity nodes such as the Yeppoon waterfront. A number of small scale projects linking the existing network are 'easy wins' in this location.





# Vision

The following is a suggested Vision for the catchment which can help drive the initiatives and actions contained in this document:

*An active connected and walkable catchment enjoyed by the community and visitors for its source of freshwater, healthy waterways, environmental qualities and recreation opportunities. A catchment that promotes local waterways as safe and attractive wildlife corridors.*

The intention of the master plan is to create a more walkable and connected community by promoting a range of connections through the catchment area.

Schools and other community and recreational facilities should be connected within the catchment through either linkages utilising the creek corridor where available or along the road network where safe to do so. This along with a range of community education actions and campaigns should be the focus of the master plan.



Figure 7 - Elements of pedestrian and cycle connection already exist in the lower catchment.





Figure 8 - Eden Park like other parts of the open space need a purpose and activation.

# Strategic Master Plan

This section deals with the strategic view of the catchment and details a range of interrelated policy responses. The master plan provides a broad overview of catchment. It is not a detailed analysis of the creek and its tributaries but rather tries to lay a platform for further policy investigation and action.

Policy response for the master plan will be formed around six key elements:



## Policy and Planning

In particular looking at issues such as how the planning scheme does or should be treating parts of the catchment. It will consider any significant changes to Council's current policy regime in response to particular catchment issues.



## Stormwater and Water Quality

Locations within the catchment have been identified as suitable for some form of regional treatment facility for stormwater. These facilities slow and polish stormwater as it flows into the creek system. These items are important in maintaining the health of the system, its waters and the many flora and fauna species in all parts of the creek that depend on this catchment.

Ideally the design of stormwater infrastructure should:

- prevent or minimise adverse social, environmental, and flooding impacts on waterways, overland flow paths and other parts of the drainage network; and
- ensure that the design of channel works as part of development maximises the use of natural channel design principles where possible. This more natural solution has the added benefit of bringing beauty and wildlife habitat to the local area.

Ideally all households should be encouraged to have rainwater tanks and rainwater gardens to assist in retaining and treating stormwater. Public streets should be used as part of the treatment train particularly in upper parts of the catchment that are undeveloped. The avoidance of concentration of flows and the use of natural drainage channels along streets need to be incorporated into operational works design. The aim is to slow stormwater entering the creek system to reduce velocities at the bottom of the catchment.



## Education & Community Action

Given the nature of some parts of the catchment where public access is not possible, the community needs to be enlisted, educated and empowered to take on a stewardship role for the catchment.

A stewardship programme needs to be lead by Council with the assistance of a range of state and local community groups. This programme could include:

- Education material dealing with issues weed management, catchment role and identity, what can I do to help?, etc.
- Catchment signage showing that residents and visitors are part of a catchment.
- Letter box signs and street signs
- Offering incentives and resources to residents and community groups to assist in maintaining parts of the creek corridor – weed removal, replanting, etc.
- Include local schools within the catchment

The stewardship programme could be extended to include schemes such as land for wildlife for upper catchment areas or backyards for wildlife which could operate on a far smaller scale for areas in the middle catchment.



## Flood & overland flow

This includes physical responses such as back flow valves, detention and retention facilities. It also includes ensuring sufficient capacity is maintained within riparian corridors to cater for the flood events and ensuring urban development does not impact upon both storage and conveyance of flows.



## Environment & Open Space

This includes a number of elements including:

- Recognising the creek and its tributaries as playing a role in local habitat linkages
- Removal of weeds and other invasive species from the waterway
- Protection of parts of the upper catchment from unnecessary development
- Ensure development in the upper catchment recognises the importance of maintaining the environmental values of the catchment and provides a suitable design response
- Revegetation of the creek and its banks
- Creating access to the creek through open space corridors that line the creek providing a network of riparian corridors
- A programme of street trees to assist with both the creation of habitat and in the greening of existing urban areas
- Valuing and programming open space



## Connection & Access

Physical access is constrained through parts of the catchment however other opportunities exist to create or enhance linkages lower in the catchment, create new linkages in the upper [arts of the catchment or provide linkages to other paths such as the Rail Trail. This Master Plan explores a number of options for further pedestrian and cycle access in the catchment.

The ability to walk and cycle all parts of the catchment needs to be a goal of the master plan. This master planning process investigates opportunities and strategies that could be applied in locations right across the catchment. These are detailed on the following pages.



# Upper Catchment

The overall intent for the master plan in this location is to maintain areas of vegetation and habitat as first priority. This has the effect of reinforcing the existing habitat linkages and maintaining water quality of stormwater runoff. Some redevelopment is expected in the upper catchment and therefore planning policy needs to be of sufficient detail and strength so as to maintain environmental and water quality values for riparian corridors where they occur in development parcels.

Securing larger parcels of land with environmental value located along waterways will contribute the connectivity of the catchment to other regional environmental corridors. This will require either strategic purchase of land by Council or the state government or entering into an agreement with private land holders.

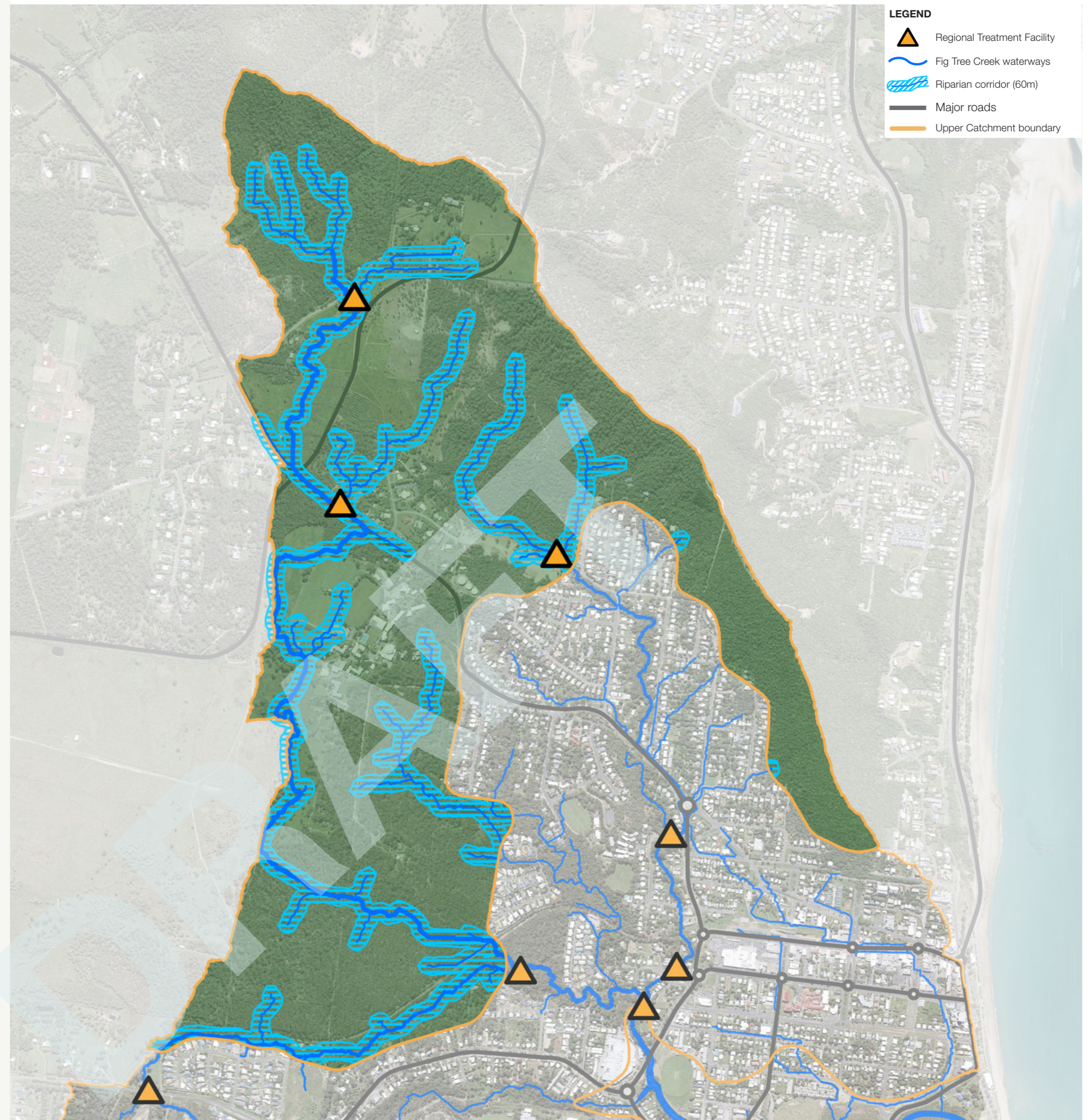


Figure 9 - Waterway mapping of Fig Tree Creek – Upper Catchment





## Policy + Planning

At present the planning scheme does not contain sufficient detail in order protect items of local environmental significance or to ensure there is an adequate design response for future urban development within the catchment. To ensure the existing patterns of urban development are not repeated in the catchment the following amendments are recommended.

The strategic framework whilst maintaining an effective urban footprint around the town does not recognise the Fig Tree Creek Catchment in any way. It neither recognises the creek as an environmental corridor or its ability to contribute to a movement network.

The Draft Reconfiguration Code does not adequately address issues of lot layout design, road network design or pedestrian and cycle networks. As a minimum the Reconfiguring a lot Code needs to stipulate that

- All lots are designed to overlook open space and riparian corridors to improve safety and surveillance in accordance with the principles of CPTED
- Minor roads are to adjoining all open space and riparian corridors
- Riparian and other waterway corridors in all residential zones are not to be included in private lots
- Cycle and pedestrian paths are aligned to the open space network.
- The road network minimises fragmentation of areas to be conserved for biodiversity, waterway and/or environmental purposes

In addition, further mapping should be generated to ensure the creek and its major tributaries are nominated as Local biodiversity corridors for the purposes of the draft Biodiversity code as shown in Figure 9. These mapped areas need to remain in public ownership.



## Flood + Overland Flow

The detention and/or retention of flows will improve the ultimate flow through the lower catchment. Some preliminary work has been undertaken on the catchment and have identified where these regional treatment facilities are likely to occur as shown in Figure 9. These are just preliminary at this stage and the ultimate size and location of the final facility will be subject to further stormwater and hydraulic analysis to be undertaken by the development proponent. These elements need to be mapped and included in the planning scheme to signal council's intentions for these infrastructure items



## Stormwater + Water Quality

The majority of this part of the catchment is at present not developed. Retaining these areas in their natural state maintains the health of the waterways. Parts are zoned for rural purposes and in these areas owners should be encouraged to maintain the health of the waterways by limiting stock movement through the waterways and creeks, maintaining vegetation cover and limited the use of fertilisers, pesticides and herbicides.

In other areas the maintenance of vegetation cover is important by limiting tree removal and earthworks are key objectives.

Street design and layout should also reflect WSUD principles enhancing landscape and habitat features creating an "Urban Ecology". This can be achieved through avoiding concentrating flows and using vegetated swales, bioretention systems and wetlands within streetscapes and opens space areas as shown in Figure 10.



## Environment + Open Space

Maintaining a strong urban footprint is an important first step to maintain the health of the catchment. When further land development occurs, it should be a necessary precondition of that development that waterways are included in open space corridors of sufficient minimum width to maintain riparian vegetation, encourage pedestrian and cycle connectivity and allow appropriate stormwater infrastructure. A minimum width of 60m (exclusive of road reserves) is recommended for all waterway corridors as shown in Figure 9.

This will ensure environmental values of any waterways are maintained and allows for edge effects of urban development.

Tenure in this regard is important as the larger waterways must remain in public ownership. The private ownership of important waterway corridors as part of urban development has led to poor environmental outcomes elsewhere in the catchment.

The purchase of environmentally significant sites should also be a consideration where other forms of agreement or control can not be achieved.



## Education + Community Action

In all parts of the catchment this element has the potential to perhaps drive the most change in terms of culture and engagement with issues concerning the catchment.

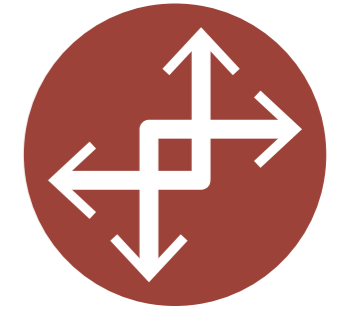
A possible education campaign may have the following elements:

A general awareness campaign should be introduced for the entire catchment that highlights to residents, visitors and schools that they are indeed part of a water catchment as shown in Figure 11. This has been done successfully in Brisbane.

Fig Tree Creek signage should be introduced. In many parts of the catchment it is difficult to identify where the creek is. Signage at various crossing should be introduced in all parts of the catchment but more importantly in the middle and lower parts.

Land for wildlife campaigns run in South East Queensland sponsored by the state government and a number of local governments and other bodies. Land for Wildlife is a voluntary program that encourages and assists landholders to manage wildlife habitat on their properties. They offer education about native plants, animals and ecosystems and provide advice on managing threats such as weeds and pest animals. Their assistance is provided to residential and rural landowners as well as schools, golf courses etc. Securing land within the catchment that adjoins the creek and provides for environmental connectivity could be secured using this type of programme. Particularly they offer expertise and assistance in habitat restoration weed management etc.

The land for wildlife type of approach can work well for larger landholdings rural properties, schools etc in the upper catchment.



## Connection + Access

Formal connection and access in the upper catchment is not a priority aspect of the plan except in a strategic and policy sense. As most of the catchment has not been developed, getting physical access will generally only be achieved as part of further development. As a matter of urgency, a movement plan needs to be generated for this part of the catchment and integrated with councils' overall movement strategy so that when development occurs elements of the movement network impacted by the development can be incorporated into the design and layout. This has implications for the LGIP and needs to be investigated as part of normal infrastructure reviews.

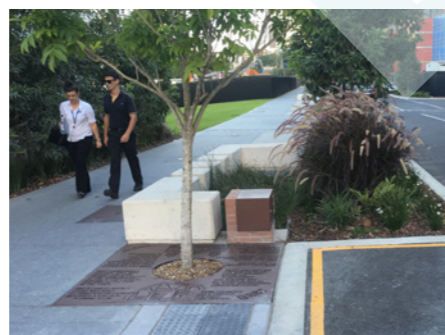


Figure 10 - Examples of WSUD treatment devices



Figure 11 - Creek catchment signage from Brisbane City Council



# Middle Catchment

This part of the catchment is highly urbanised and highly degraded in terms of its environmental quality. The fragmented ownership patterns and small land holdings make achieving successes here difficult. The emphasis in this part of the catchment is on improving the health of the waterway through weed removal, sensitive replanting and community education.

Physical access along the creek corridor is for the most part impossible. Improvements in water quality and as a habitat linkage, will be reliant on community 'buy in' to improve the health of the system.

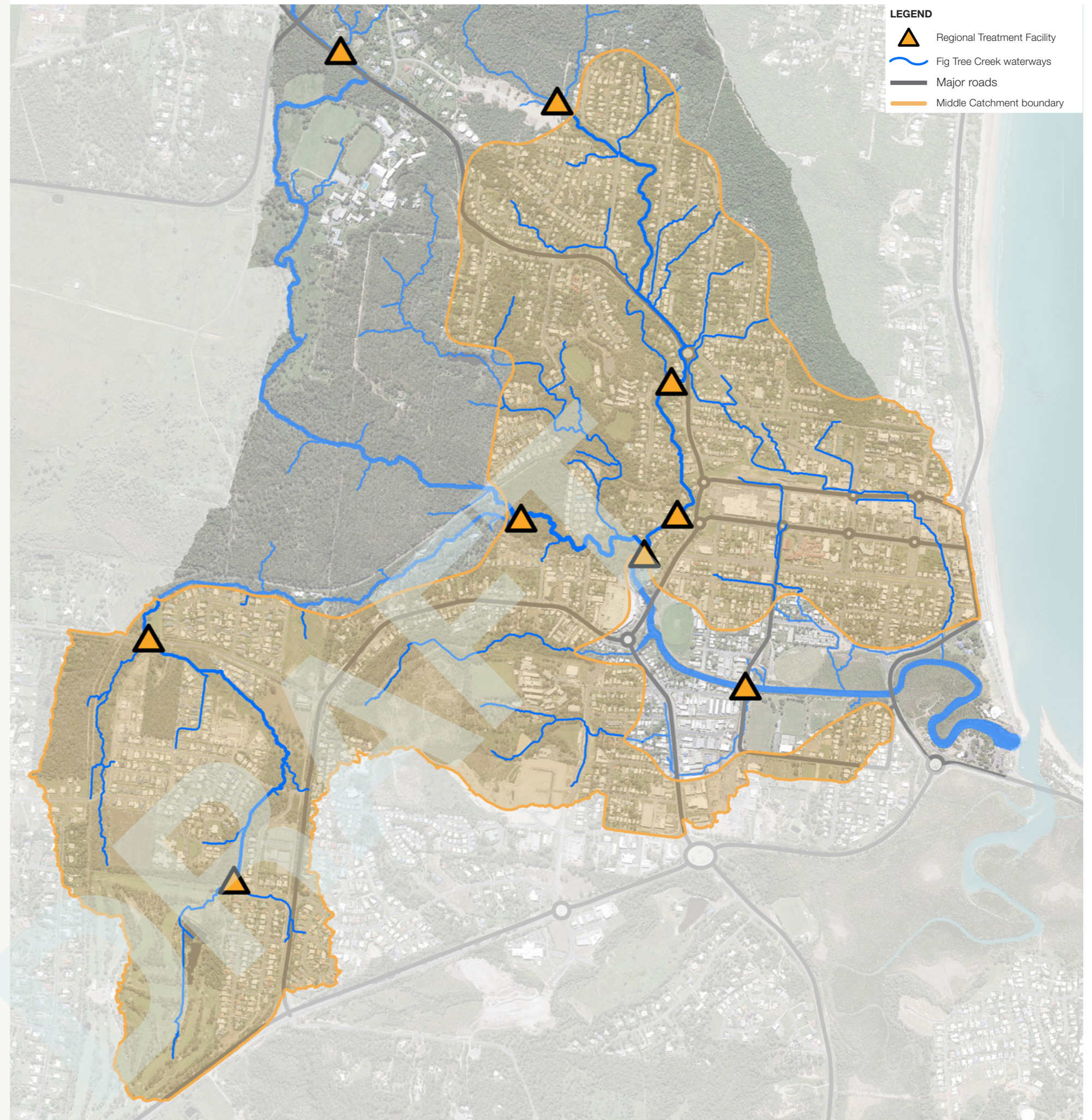


Figure 12- Fig Tree Creek – Middle Catchment





## Policy + Planning

Given the existing pattern of development the planning scheme has little influence in this part of the catchment. Should redevelopment occur the only parts of the planning scheme or other council policy that will come into effect are likely to be in relation to issues such as vegetation retention, landscape plans, sediment and erosion control, etc.

Local laws in relation to the protection of vegetation and weed removal have perhaps greater influence. If public education campaigns with incentives to assist in weed removal and revegetation are the carrot, then local laws perhaps represent the stick.

Brisbane City Council's Natural Assets Local Law (NALL) 2003 helps to protect natural assets, including bushland areas, wetlands, waterway corridors and trees in urban areas.

The law affects residents if they own or occupy land:

- near a river or a waterway
- that has a significant landscape tree/s
- in a bushland area
- in an Emerging Community Zone or other urban area with large trees.

There are four categories of protected vegetation. These are:

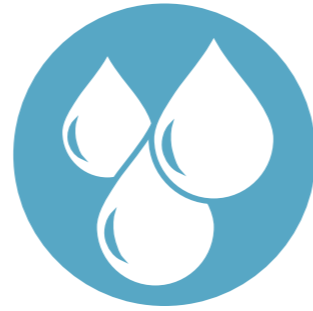
- Council vegetation
- waterway and wetland vegetation
- significant urban vegetation
- significant native vegetation

The development of a similar local law for Livingstone Shire may be beneficial in helping to protect native vegetation in the waterway corridors.



## Flood + Overland Flow

There is little room here for intervention for physical detention or retention devices in this part of the catchment. It is recommended that further analysis of the flood characteristics in this part of the catchment be undertaken. This should be done in conjunction with identifying suitable locations for Regional Treatment Facilities (RTF's). These facilities need to be considered as part of a larger flood study for the catchment identifying suitable locations for treatment facilities and where necessary identifying sites that need to be acquired to allow for their installation. Possible locations are shown in Figure 12.



## Stormwater + Water Quality

Again, as with flood mitigation RTF devices will contribute to water quality objectives for the catchment by polishing stormwater before entering the creek system.

As with the upper catchment street design and layout should also reflect WSUD principles. In this regard it is more likely these elements will need to be retrofitted to existing streets using road reserves, roundabouts etc to achieve WSUD outcomes.



## Environment + Open Space

There are few opportunities to secure more open space in this part of the catchment except through site acquisition.

An open space study is required for this part of the catchment. There are a number of parks that are located adjoining the creek systems most of which are poorly maintained or activated and provide little value to the communities they serve or the catchment. An open space study needs to identify these spaces and look at:

- How these spaces can be activated
- How they can contribute to water quality and environmental goal for the creek
- What role they have in providing physical contact with the creek – getting people to touch, feel and enjoy the waters of Fig Tree Creek
- What role these can play in ideas of physical connectivity

Environmental values of the creek have the potential to be enhanced, although as discussed it will require community input to achieve this. This is discussed more fully under Educations and Communication.

In addition to the above fishways as shown in Figure 13, could be incorporated into existing road crossing and culverts in this part of the catchment. Fish undertake migrations for a number of reasons including to spawn, feed and seek refuge. These migrations are also essential to ensure the dispersal of species and maintain genetic fitness within fish communities. Fishways, also known as fish ladders or fish passes, are structures placed on or around constructed barriers (such as dams or weirs) to give fish the opportunity to migrate. For the Fig Tree Creek Catchment, these items could be incorporated at a number of locations to help improve the health of the waterway.

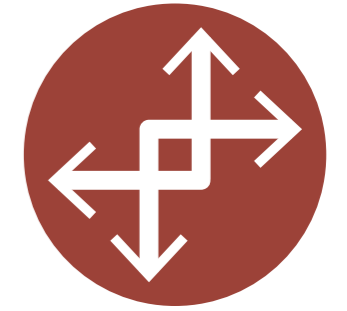


## Education + Community Action

The land for wildlife type of approach has been discussed for the upper catchment. In the middle catchment areas, land holdings are smaller and would not qualify under the land for wildlife programme. A separate programme running in parallel that assists with smaller land holdings may also be beneficial. 'Backyards for wildlife' for instance could be a similar styled programme tailored for the Fig Tree Creek Catchment where the creek gets subsumed and lost behind back fences. Backyards for wildlife would work with owners of smaller landholdings to remove weeds, restore riparian corridors to improve the water and environmental quality of the creek and its visual amenity.

This could be backed by limited council resources to provide coordination and an educational material. Council could provide green waste removal and provide tube stock to allow areas to be replanted. As with land for wildlife some form of sign could be placed on participating front yards demonstrating people's commitment to restoring the health of the waterway.

There are a number of volunteer groups and organisations in the Yeppoon area that could be engaged to undertake this kind of service backed by Council resources in terms of plant tube stock, provision of materials, expertise and office space.



## Connection + Access

Connection & access are very limited making the community action options the most viable for this part of the catchment. There are a limited number of points along roads where additional access points can be formalised. These additional points of access can be considered and detailed as part an open space study for the catchment. This study should include providing additional connection with the Capricorn Coast Pineapple Rail Trail.

Given the above all efforts should be made to make walking and cycling as attractive options in other parts of the catchment. A finer grain access network should be identified for the catchment to link activity nodes and attractions such as the foreshore, schools, golf course, shops etc. This should include identifying both on road and off road connections. In addition a programme of street tree planting for the catchment. Street trees and footpaths help to create better walking environments. At present there are significant areas of existing urban development with little or no street trees. A street tree and footpath programme could assist in promoting walking and creating a better walking environment in the catchment.



Figure 13 - Werribee River Fishway



# Lower Catchment

The Lower catchment which contains the tidal reaches of the creek contains large areas of open space both formal and informal and provides many opportunities for access, connection and recreation.

A foreshore master plan has been developed for the foreshore area of the Yeppoon Town Centre from the mouth of Ross Creek (and Fig Tree Creek) along the waterfront area of the town centre. This catchment master plan will capitalise on this particularly in terms of connection and access to enhance this part of the catchment.

## NOTES

1. Potential location for regional treatment facility. The final location and size of this facility is subject to further detailed investigations
2. Bank stabilisation and revegetation must occur in this location as a matter of priority
3. Revegetation of creek corridor. This should be occurring along the length of the creek in this part of the catchment
4. Sediment Control Device. A device in this location can be included with the existing culverts.
5. Should the AFL club choose to move in the future, this site provides for a broad range of opportunities such as a Wetlands Interpretive Centre. This should be the subject of a separate master plan for this locality that deals with the reuse of this site and how ped/cycle access can be better achieved..
6. This part of the catchment has the potential to be part of a broader canoe/kayak trail which includes Ross Creek.
7. Some elements of pedestrian and cycle paths exist. Extensions to this path should be completed through a boardwalk and bridge to connect with proposed elements of the Foreshore Master Plan.
8. New ped/cycle bridge crossing of Fig Tree Creek as part of a boardwalk extension to the existing cycle path. This may include a potential connection under the existing bridge at Appleton Drive when future works are undertaken to the bridge
9. As part of upgrades of for the town centre this should include upgrades to the pedestrian crossing at this point
10. Ped/cycle connection to join with Foreshore Master Plan connections



Figure 14 - Fig Tree Creek – Lower Catchment





## Policy + Planning

This area is dominated by areas of wetland and open space. Policy in this regard needs to be geared towards maintaining access to these areas and ensuring development does not encroach into wetlands and areas impacted by flooding. Flood analysis back by planning scheme policy should control development activity in these areas.

The following issues and policy matters should form the broad policy response for the wetlands and ecosystems in this part of the catchment:

- The maintenance and re-establishment of the connectivity of ecosystems, particularly remnant ecosystems;
- Ensuring viable populations of protected native species continue to exist throughout their range, by maintaining opportunities for long-term survival, genetic diversity and the potential for continuing evolutionary adaptation. This includes the protection of significant wildlife habitats, such as:
- Protecting significant wildlife habitats (including roosting, nesting and breeding habitat for turtles, birds or crocodiles) through suitable management measures including buffers for those habitats;
- Retaining the current extent and quality of migratory and resident shorebird roosting and feeding habitat. If habitat is to be lost it should be replaced, where practicable, before loss, by an equivalent artificial habitat in a location that minimises any alteration of distribution and abundance of shorebirds;
- Maintaining the values and integrity of fish habitats and fish migratory pathways through suitable management measures - sediment and erosion control, waste and litter, etc;
- The retention of native vegetation; and
- The retention of and appropriate management of riparian vegetation along waterways of sufficient width to provide for a self-sustainable linked network.

These policy matters should be reflected in the planning scheme to guide the protection of catchments throughout the Shire.



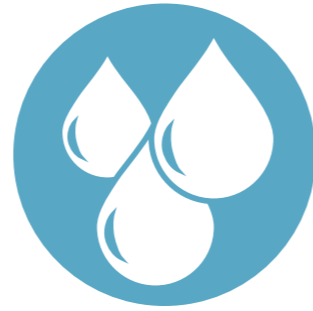
## Flood + Overland Flow

Much of this lower catchment area is flood affected and subject to inundation. Prudent policy should be avoiding further development in these areas in the first instance and ensuring what development there is flood resilient in its construction.

There are a number of overland flow channels created to take some tidal flows. The gradual conversion of these channels to natural channels encouraging revegetation and ground water infiltration will assist in providing further wetland habitat.

Natural drainage systems have a number of advantages including:

- supports existing wetland and riparian vegetation
- creates habitat for wildlife and aquatic species
- slows down and attenuating floodwater by spreading out flows through vegetated creeks and corridors
- promotes of infiltration and groundwater recharge
- enhancement of water quality
- complements recreation paths and linkages and promotes walkability and active recreation
- improves amenity and visual appearance



## Stormwater + Water Quality

Perhaps this is where considerable efforts could be made to the improvement of the health of the waterway and the ecosystems that are dependent upon the creek in the lower catchment.

In this part of the creek an emphasis should on the improvement of water quality through:

- Treatment of urban runoff
- Sediment and erosion protection and controls
- Removal of rubbish and other waste (through trash racks, detention areas etc)

Sediment and erosion controls may include 'in line' sediment controls that can complement existing culverts crossings and that can be easily maintained.

As part of this Strategic Master Plan consideration should be given to method of rating or scoring each catchment on the Capricorn Coast to consider the health of the system from an environmental as well as a community perspective. Overall measures for each catchment to compare the health of this and other catchments to gauge remediation actions and guide future policy direction on things such as:

- Sediment and erosion control
- Community access and active recreation
- Waste
- Water quality
- Environmental quality
- Habitat restoration and weed removal

The Healthy Waterways organisation has been running for several years in South East Queensland where community pressure to improve waterway health is arguably greater. However, given that this project is currently being undertaken there is obviously some pressure to improve waterway health on the Capricorn Coast.

Health Waterways is a not for profit organisation with the backing of Government, scientific, university and community organisations.



## Environment + Open Space

As noted above the part of the catchment has perhaps the most significant extent of both flora and fauna as a result of the wetlands around the mouth of Fig Tree and Ross Creeks. The area also has extensive areas of open space which reflects the extent of flooding in the locality.

Just east of Park Street between Park Street and Arthur Street, Fig Tree Creek has been heavily modified to cater for adjoining development such as the showgrounds. This tidal section of the creek has some serious erosion issues due to both the nature of the soils and the velocity of water moving through the system at this point. Remediation works are required at this point to reline, revegetate creek banks and add measures to reduce water velocities at this point. This is a key action that needs to be undertaken as a priority.

Swan Park east of Arthur Street is currently being used by the one of the local AFL clubs. The lease on this land is due to expire in a couple of years and there are plans to relocate this club out to the Barmaryee sports facility. This will then free this space up for a potential range of uses. Given the nature of the locality it would be expected this space could accommodate a range of this such:

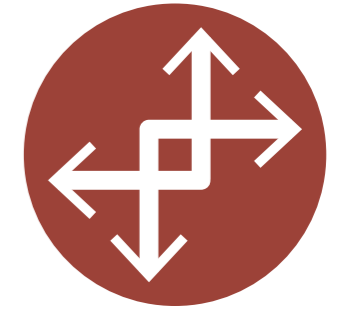
- Additional flood attenuation and storage (including sediment control)
- Extension to the existing wetlands
- Passive recreation – boardwalks birdwatching etc.
- An educational/interpretive centre

A separate master plan for this site could explore the spatial arrangements of a number of opportunities and how these would tie into the Foreshore Master Plan.



## Education + Community Action

Most of this area has excellent access or potential for excellent physical access along the creek and within some of the wetland areas. Community education in this instance should revolve around the value of wetlands as habitat for fisheries and for other fauna. Education should also focus on the impacts of waste on estuarine and marine environments. In this regard the reuse of Swan Park when the AFL club leaves could be for a wetlands interpretive centre. This centre could focus on catchment planning, wetlands, and marine education.



## Connection + Access

There are abundant opportunities in this part of the catchment to explore opportunities for further connection. Figure 14 explores further opportunities for connection through this part of the catchment and in particular developing linkages with the Foreshore and the Foreshore Master Plan area.

Active recreation should also be encouraged in this area including:

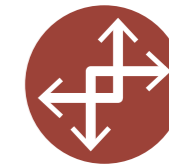
- Fishing - recreational fishing occurs in the area, both shoreline and boat fishing;
- Swimming;
- Canoeing and other non-engine powered watercrafts;
- Environmental Groups - several environmental groups use the area, one of significance is CoastCare, who have rehabilitated a section of the Environmental Reserve;
- Playgrounds;
- Picnicking areas.
- Boardwalks

All these uses can be catered with in this lower catchment. A further detailed master plan that connects with the foreshore master plan should be developed which further explores opportunities highlighted here.



# Implementation

The following section identifies the broad range of projects highlighted in this master plan. It also highlights the relative priority of each initiative. Table 1 provides a ready reckoner breakdown of the project and provides an indication of responsible agencies and departments. It also ascribes a priority from 1 - 5 with 1 being the highest priority and should be completed as soon as possible.



	Policy + Planning	Flood + Overland Flow	Stormwater + Water Quality	Environment + Open Space	Education + Community Action	Connection + Access
Upper	Planning scheme amendments - <ul style="list-style-type: none"> <li>Strategic Framework</li> <li>Reconfiguration Code</li> <li>Biodiversity Code</li> <li>Planning scheme mapping</li> </ul> LSC CS & P Priority 1	Regional Treatment Facilities to be nominated on plan LSC IS, CS&P Priority 1	Maintain vegetation cover Limit stock access to waterways Minimise earthworks Incorporation of WSUD design principles into street layout and design DNR, DPI, LSC IS Priority 3	Maintain current urban footprint Strategic land purchase or agreement on environmentally significant sites Waterways to be included in public open space corridors which may include ped/cycle pathways LSC CS&P Priority 1	Catchment awareness campaign including signage and education of residents, visitors and schools Land for wildlife programme LSC CS&P, CS, Community Groups Priority 2	Access and movement plan identify ped/cycle route and linkages LSC CS&P, Priority 2
Middle	Natural Assets Local Law LSC IS, CS&P Priority 5	Regional Treatment Facilities to be nominated on plan. LSC IS Priority 1	Incorporation of WSUD design principles into existing streets. LSC IS, CS&P Priority 2	Open space study Fishways LSC CS&P, Priority 3	Backyards for wildlife programme LSC CS&P, Priority 2	Street tree planting Fine grain access and connections study for ped/cycle movement to be combined with open space study LSC CS&P, Priority 2
Lower	Environment policy aimed at maintaining the integrity of the wetland and limiting intrusion and impact from urban development. LSC CS&P Priority 1	Flood resilient construction for all buildings subject to flooding and inundation. Conversion of overland flow channels to natural drainage channel design. LSC IS, CS&P Priority 4	Sediment control device located in stream Healthy waterways Cap Coast establishment to monitor catchments in Capricorn Coast LSC IS, CS&P Priority 3	Remediation works for the lower Fig Tree Creek Revegetation along creek banks and ped/cycle paths Master Plan for Swan Park LSC IS, CS&P Priority 1	Wetlands Interpretive & education centre for Swan Park LSC CS&P Priority 3	Completion of ped/cycle linkages including new bridge LSC IS, CS&P Priority 2





## Next Steps

This first stage has set out some broad principles, strategies and concepts to provide strategic direction for issues within the Fig Tree Catchment. It provides an overarching Vision and Concept Plan to inform detailed master planning.

The next steps for Council to progress issues and ideas arising from this master plan would be:

- Use the master plan to guide Council's long-term planning and spending.
- Conduct technical studies to work out which ideas are feasible and which ones will work best.
- Undertake detailed master planning of areas as nominated in this document.
- Present the plan for community feedback. Seek community comments on early ideas.
- Begin turning the ideas into reality through targeted projects.
- Partner with locals, businesses and community groups to undertake key initiatives.
- Explore fresh ideas and new solutions to old problems.

There are a number of items that need urgent attention such as the relining and revegetation of the lower part of Fig Tree Creek as shown in Figure 15. This should be undertaken independent of other work detailed here.



Figure 15 - This part of Fig Tree Creek is an immediate priority





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