# NORTH WEST BAY RIVER CATCHMENT MANAGMENT PLAN 2018 - 2027

The vision "To ensure that management of the North West Bay River catchment provides for preservation of the natural and social values of the area."

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Kingborough

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# Contents

# Executive Summary

The update of the 1999 North West Bay River Catchment Management Plan has found that the condition of the catchment appears to be relatively stable in the 15 years since the initial plan was developed and implemented. The initial plan was a comprehensive document which was the catalyst for some large scale strategic projects within the catchment such as willow removal, fencing and revegetation projects.

These initial projects resulted in improvements to the condition of the catchment values and an improved understanding of the threats to the catchment.

Despite this, many of the threats to the Catchment values identified in the 1999 plan remain today. The largest threat to the catchment values appears to be weeds. A number of additional weeds have appeared within the catchment in the past 15 years and the distribution of other weeds such as Spanish heath have increased significantly. There are also emerging threats associated with climate changes such as extreme weather events, temperature increases, and sea level rise which present new challenges.

Maintenance of major works carried out under the 1999 plan have been identified as an important action under the plan. Following up the large-scale willow control work, revegetation and fencing projects are essential to consolidate the progress made. Revitalising these projects also allows for the community to celebrate the success of past projects and re-energise for the challenges of new projects conserving the values of the Catchment.

The scope of this Catchment Plan update did not allow for collection of detailed data on current conditions within the Catchment. However, the update identified that there is a lack of detailed data on factors that influence catchment health such as river flow rates, water quality, river bank condition (geomorphology), change in vegetation cover, change and distribution of weed and pests. Actions to be taken under this plan includes collection of improved data to assist with the prioritisation of management priorities and actions.

The management of the threats will require input from all land owners and management agencies within the Catchment. The objective of management is to maintain and improve the resilience of the Catchment. The community as the majority land owners of the Catchment are key to implementing action to conserve and maintain values. The key action of this plan is to engage the community in the management of their land for the benefit of the wider catchment.

Private land owners and the community can assist with the management of the catchment through the following actions;



- Managing weeds on your land; increasing your knowledge of weed species, their impacts and their control;
- Maintaining wastewater and septic tanks to prevent impacts on water quality;
- Preventing stock access to waterways;
- Rehabilitating eroded areas; revegetation of cleared land adjacent to waterways;
- Managing runoff from driveways and roads to minimise sediment reaching waterways; and
- Managing pets to minimise impacts on native wildlife through predation and toxoplasmosis.

The Council and other management agencies have a role to play with the management of their own land, planning and legislative controls, information sharing and support to the community. Core actions from review of the plan identified are:

- Follow-up control of major works undertaken previously;
- Re-energise the community to manage their land
- Set achievable management targets.
- Survey waterways for willows to guide follow-up control programme especially in the light of recent flooding.
- Undertake detailed surveys to guide further actions and priorities.

# 1 Introduction

The purpose of this management plan is to support action and re-engage the community in the conservation and maintenance of the natural and cultural values of the North West Bay River Catchment. Hereafter referred to as 'the Catchment'.

The plan provides background information about the Catchment values and character. Information from the past catchment management plan and the subsequent review have been used to inform the format and directions taken by this plan. A summary of key natural and cultural values and their overall relevance and importance is provided. This is followed by an assessment of the current threats to values and identification of actions which are important for maintenance and conservation of the values.

The vision for the Catchment remains the same as articulated in 1999:

"To ensure that management of the North West Bay River catchment provides for preservation of the natural and social values of the area."

The Catchment is generally in good condition and since the initial plan was written the level of change within the catchment appears to have been relatively stable. Whilst there were no major threats identified it was determined that a lack of data exists on water quality, river bank condition (geomorphology), changes in vegetation cover and distribution of weed and pests. Without detailed and long-term data it is difficult to quantify the changes in the Catchment over the past 15–20 years. The Catchment also faces emerging threats from climate change such as extreme weather events, temperature increases, and sea level rise.

Pressures on the Catchment from loss of vegetation, population growth and other development pressures are less than other catchments within the municipality. The Catchment headwaters are in excellent condition and the majority of sub catchments are relatively intact. Consequently, the degree of threat to natural values is limited within the catchment in comparison to other areas. As such the allocation of resources by the Council and other management agencies has generally been limited with the focus of investment being where risk is high and high values poorly reserved. For example, in White Water Creek catchment funds have been allocated to help protect and rehabilitate stands of white and black gum which provide important habitat for threatened species; Forty-spotted pardalote and Swift Parrot.

Whilst the allocation of resources to this catchment is less than other priority areas, the ongoing management of the catchment is important to ensure that values are maintained. This plan represents support for community action in the Catchment and an ongoing commitment to conservation of the natural values. Council is a small landowner in the catchment, there is little opportunity for Council to drive large scale projects. The catchment is predominantly within private ownership (>70%). The Council will continue to manage, protect and improve the condition of natural values in Council owned reserves. Council will also continue to use the planning scheme to try and protect the highest natural values, the river and its tributaries from the impacts of development.

Council also has an important role in engaging with and empowering local communities to get to know the landscapes of the catchment better and sharing information about how to

minimise their impacts. Maintaining the resilience of the Catchment is imperative in the face of the future challenges of climate change and population growth.

## 1.1 Background

The North West Bay River is the largest river system in the Kingborough Municipality with a catchment area of approximately 9,600 hectares. The Catchment incorporates a large proportion of the southern slopes of Mt. Wellington. The North West Bay River is 25 km long and flows through Wellington Park, intact native vegetation, agricultural land and rural residential development until it meets the estuarine mudflats of North West Bay at Margate. The river has a vertical drop of 1,270 metres along its 25 kilometre length. Upper tributaries include Plains Rivulet, Leverts Creek, Quarry Creek, and Coombes Rivulet which enter the river close to Longley and together contribute approximately 46% of the flow of North West Bay River. Thomson Creek and Allens Rivulet drain most of the south-western area of the Catchment after originating in the Snug Tiers Recreation Reserve. Mafeking Creek is the dominant sub catchment for the northern slopes below Sandfly (*Figure 1*).

Approximately 50% percent of the Catchment remains in natural condition and about half of this area is formally reserved. The remainder of the Catchment is dominated by rural residential properties and agricultural land with some viticulture and intensive farming undertaken in the lower end of the Catchment.

Approximately 70% of the Catchment is private land and parks and reserves account for the remaining 30%. Wellington Park is the dominant reserve at 2,740 hectares or 25.9% of the Catchment. Kingborough Council owns and manages a relatively small area of the catchment including a series of linear riparian reserves which make up <1% of the total catchment area. The remaining reserved land is managed by Crown Land Service (DPIPWE) and include riverside reserves along the North West Bay River.

The population of the Catchment was estimated in 1999 to be in the order of 1,500 of which over 750 people were living in the Longley area. The population of the Catchment has increased since this time mainly due to the subdivision and development of small rural or bushland lots. The villages of Longley, Lower Longley, Leslie Vale, Sandfly, Allens Rivulet and Kaoota are within the boundary of the Catchment.

## 1.2 History of catchment plan, reviews & actions in the original plan

A comprehensive catchment management planning process was undertaken in 1999 which resulted in the North West Bay Catchment Management Plan (Green 1999). The planning process included a review of the condition of the Catchment's natural values and sought community opinion about a range of topics. Key topics covered were rivercare, water quality and quantity, vegetation management, weeds, wildlife and habitat management, land use and planning issues, public open space management and cultural heritage.

In 2013, a review of the plan was undertaken to fulfil requirements of Kingborough Council's Strategic Delivery Plan (2010-2015). The review highlighted key recommendations related to budget allocation for update, methodology, stakeholder engagement and technical information which should be incorporated in any up-date. Importantly the review indicated that

there was broad community support for an update of the plan. The 1999 catchment plan and its review inform this plan.

# CATCHMENT AT A GLANCE

The North West Bay River Catchment provides an unbroken corridor that connects Mt Wellington -Kunanyi to the sea at North West Bay

The river is 25 km long and is a dynamic system with highly variable flows

Catchment area = 9600 hectares

Population = 1800-2000 (est.)

Management = 70% private land, 30% public land (< 1% is Council managed)

Land use = 56% of the catchment is intact native vegetation; 9% is agricultural land (grazing, irrigated land, vineyards etc) and 35% is cleared land (urban, roads, rural residential)

Natural values = 13 threatened plants, 11 threatened animals, 5 threatened vegetation communities

Threats = weeds, erosion & sedimentation, climate change (extreme weather events/sea level rise) and population growth (more houses, more clearing, more impacts on water quality and habitat)

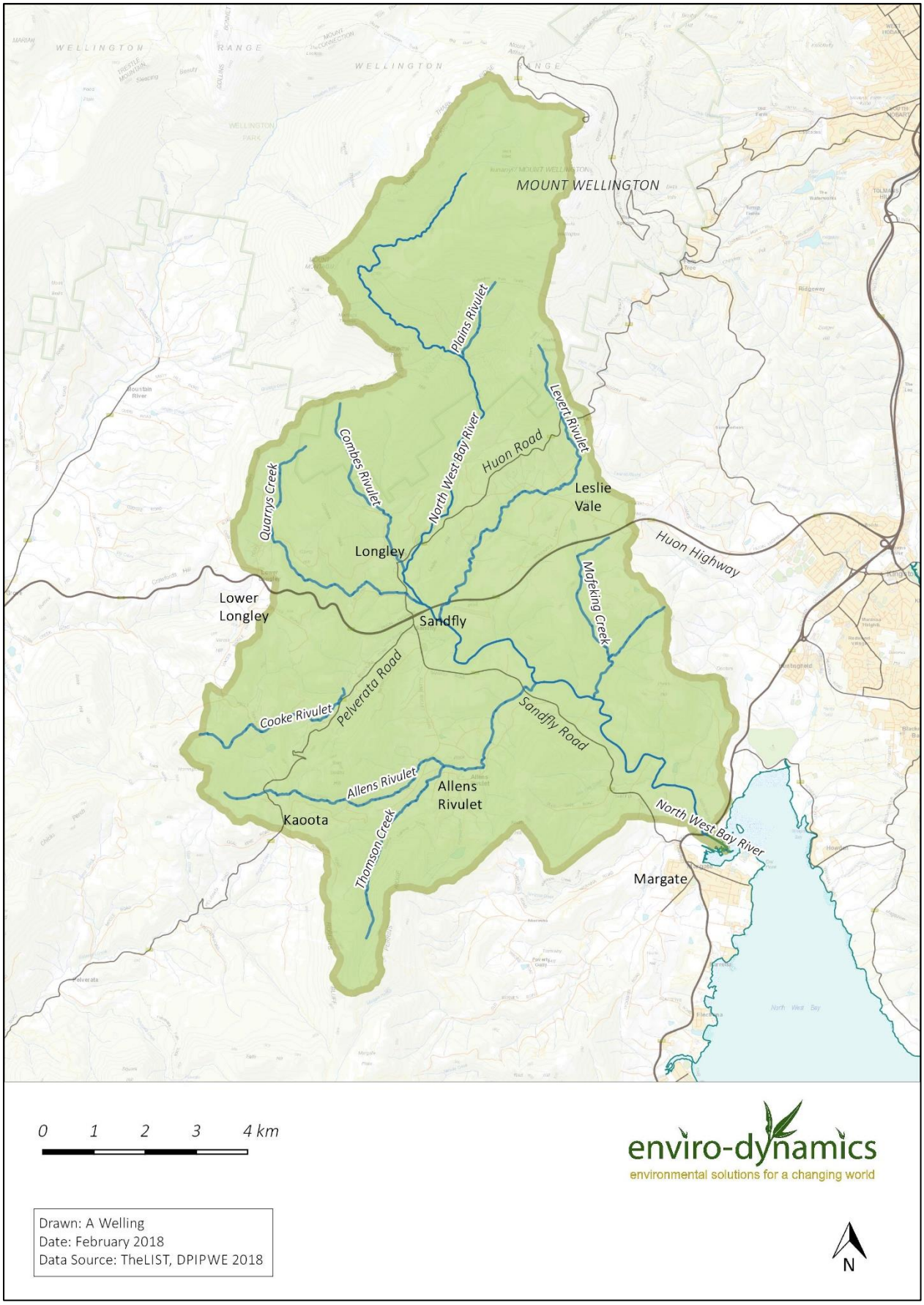


*Figure 1 – North West Bay River Catchment Area*

This updated plan is limited within its scope and did not include collection of new data on catchment values such as vegetation condition, river bank condition, water quality or water quantity assessment or weed dispersal. As such it does not attempt to emulate the depth of the past plan but instead provides an overview of the key values, updates recognised threats to values, suggests additional targeted data collection and provides suggested actions. This plan considers the review findings, including accessibility of the plan, length of plan, lack of measurable achievements and difficulties in influencing water allocations and flow, and provides actions that are within the sphere of influence of a catchment plan.

## 1.3 Consultation

A key part of developing any catchment plan is community and stakeholder consultation. The process used for this catchment plan is similar to that used in the past but with a few changes that reflect the broad adoption of technology for communication. A series of one on one interviews with key stakeholders have been undertaken. The key stakeholders were identified by area of land managed (i.e. major land managers), expertise and key interest groups. A project group was also formed; positions on the group were advertised using an expressions of interest process and key stakeholders were invited to participate. Five members were appointed to this group. The group has provided input at the initial scoping phase and reviewed the draft document prior to the community consultation phase (see Appendix 1).

This draft document and a summary report card (developed to increase the reach of the plan and awareness of the key proposed actions) will be made publicly available and community consultation sought via an online survey tool and through a National Tree Day Event in July 2018 at Longley. No public meetings will be held as social media and on-line mechanisms are likely to capture a broader audience. The findings of the community consultation will inform priorities for actions and will be incorporated into the final plan. An action under the current plan is to undertake a resourced consultation with Aboriginal community groups with connection to the catchment.

## 1.4 Character of the Catchment

The Catchment can be described as a 'flashy' system. It responds quickly to rainfall events with rapid increases and decreases in water level and flow. Periods of low flow during warmer months are a natural characteristic of this river system. The majority of the North West Bay River has intact riparian (riverbank) vegetation in good to moderate condition as much of the river is bordered by reserved land. Smaller sub catchments such as Allens Rivulet, have been subject to higher levels of vegetation clearing and agricultural use.

The North West Bay River is dividing into four major reaches based on geomorphic characteristics (Green, 1999) (*Figure 2*):

1. the headwater reach – originates from the Mt Wellington plateau to Wellington Falls
2. the gorge reach – extends from Wellington Falls to the Betts Road Bridge where the valley widens out

3. the transfer reach – from Betts Road Bridge through to Sandfly
4. the throughput Reach – from Sandfly to the coast

The headwater reach is entirely within the Wellington Park and is in excellent condition in terms of the fluvial geomorphology and macro-invertebrate assemblages. This includes a threatened fauna species (Mt Wellington caddisfly). The gorge reach is largely intact however it is impacted by water extraction for the Hobart water supply and landslips have contributed material to the river channel (Green, 1999). The transfer reach is more dynamic due to the reduction in river gradient and valley widening. This results in the deposit of large rocks in the river channel. The reach has a number of more impacted sections (Telfer, 2001). The throughput reach is more stable and varies in condition from good to low due to land use impacts.

The catchment estuary fed by the North West Bay River is identified as being 31.7 hectares in size and includes the adjacent Margate Rivulet estuary area. The condition of the estuary is influenced by factors including siltation, alteration by human use and weed invasion. These factors are also influenced by actions and inputs from the broader North West Bay area which include urban centres (Such as Margate and Snug) and industrial areas. Data on the condition of seagrass beds within the broader estuary indicated a decline between 2001 and 2011 however more recent data (2015) indicted that these has been a significant growth phase since 2011.

## 1.5 Management Responsibility

The responsibility for management of natural values and infrastructure such as roads and bridges in the Catchment is spread between several land managers.

- Private landowners – Responsible for the management of over 70% of the land area in the catchment. This includes managing weeds, managing domestic wastewater, managing stock and animal access to waterways and bushland areas, managing runoff and erosion.
- Wellington Park (Hobart City Council/Parks and Wildlife Service) – Responsible for the management of Wellington Park in upper end of the catchment (over 25% of catchment area) (includes management of land use a water catchment by TasWater).
- Kingborough Council – Manages reserves within catchment and responsible for management of the majority of the public road network within the Catchment. Has an overarching management role and provides information and support for residents within municipality.
- DPIPWE – Crown Land Services – responsible for management of approximately 4% of the Catchment predominantly along the North West Bay River.

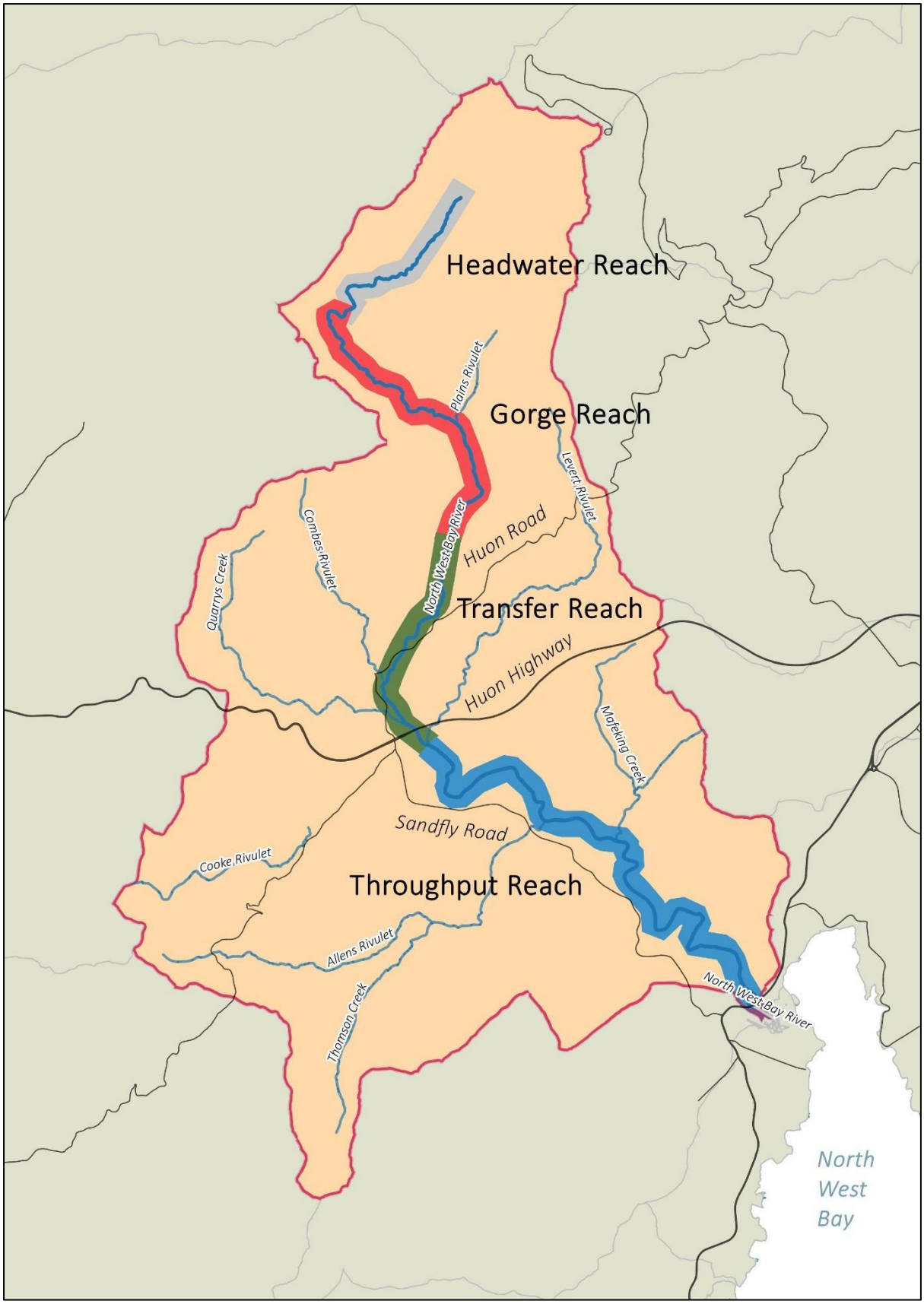


*Figure 2 – River Reaches*

# 2 Catchment values

Natural assets are important for ensuring landscape function and ecosystem service. Ecosystem services are the benefits provided to humans by our natural resources including clean air, water, and food (Constanza *et al.* 1997). Maintenance of these values is also important for the social and economic wellbeing of the community.

The natural assets outlined in this plan include water quality and quantity; native vegetation communities, threatened vegetation communities; core populations of threatened species and areas where threatened species and communities overlap.

## 2.1 Water quality

The relatively intact nature of the catchment and a lack of intensive agriculture, industrial activity and urban development means water quality in the catchment is good.

Various aquatic ecology assessments in the Catchment have been undertaken since the 1999 plan was written. These reports broadly found that the North West Bay River and most of its tributaries are in good to very good condition (DPIPWE, 2008).

These assessments have concentrated on river ecology health as measured through invertebrate and fish assemblages. Whilst these assessments are a good way of determining water quality, available data for the North West Bay River is over 10 years old.

## 2.2 Water quantity and flow

Water flow within the catchment is influenced by water extraction for drinking water supply, agriculture and domestic use. Currently there are approximately 39 water allocations in the North West Bay River Catchment and range in size from 0.4 to 8,800 megalitres/year for a total of 15,592 megalitres/year. Of these 39 allocations, 3 allocations granted to TasWater represent 98.5% of the allocation in the Catchment (WIMS, 2007 and DPIPWE 2017). These entitlements occur in the upper reaches of the Catchment with water diverted from the main-stem and tributaries along the pipeline track. Water collection occurs during low flow periods due to the limited storage in the Catchment and the physical limitations of the pipeline infrastructure. The remaining entitlements occur in the middle to lower regions of the Catchment, with the largest allocations in Allens Rivulet. All of these allocations are for irrigation with exception of two commercial take licences on Mafeking Creek, one for storage and the other for direct use.

Additional informal water taken from the catchment includes small on farm dams and ground water extraction. There is a database of all known bore locations in the catchment however take levels are unknown.

An assessment of the environmental values of the Catchment were derived from an interrogation of the Conservation of Freshwater Ecosystem Values (CFEV) database (CFEV, 2008). This identified a fluvial geomorphic river type as the primary conservation value for most river sections. The assessment found that the conservation value of these features is unlikely to be impacted by flow diversion in the upper catchment as the flow drivers for fluvial process are predominantly in the high/flood flow regime and are essentially natural given the low amount of storage in the catchment.

Whilst monthly water flow data was collected at the Margate Weir between 1965 and 2001 with intermittent data collected from 2001 to the present, the impacts of increases in rural residential development on water licencing and informal takes have not been assessed. Nor has the ground water take and change to ground water. More intensive agricultural use in the lower end of the Catchment has occurred in the recent past and may expand in the future.

## 2.3 Vegetation communities

Vegetation in Tasmania has been mapped across the State using TASVEG classification system. This system identifies broader classes of vegetation and specifies communities according to dominant species. The majority of the vegetated portion of the Catchment is eucalypt forest and woodland, 66% is dry sclerophyll and 24% is wet sclerophyll. Up to 5% is treeless montane vegetation, 3% non eucalypt woodland or forest and the remaining 2% rainforest, coastal scrub, saltmarsh and wetland.

There are four wetlands in the upper catchment which are in outstanding condition as they occur in Mt Wellington Park. There are eight saltmarshes at the mouth of the Catchment. The majority are in good condition but three are impacted by recreational use and weed invasion.

The dominant TasVeg communities in the Catchment are *Eucalyptus obliqua* dry forest (DOB), *Eucalyptus pulchella* forest and woodland (DPU), *Eucalyptus obliqua* wet forest (WOU) and *Eucalyptus coccifera* forest and woodland (DCO) (see Appendix 2 for community descriptions). The maintenance of native vegetation is important for biodiversity conservation, habitat protection, soil and carbon conservation and water quality.

## 2.4 Threatened vegetation communities

Threatened vegetation communities are significant due to their limited distribution and unique floral assemblages including threatened flora species and fauna habitat. They are also identifiable and distinctive communities that often occur in areas that have been heavily impacted by European settlement such as on deeper soils in flood plains (black gum forest on flood plains).

There are five threatened communities recorded within the Catchment (as listed under the *Nature Conservation Act 2002*, Schedule 6A) totalling an estimated 220 hectares. These include;

- *Eucalyptus amygdalina* forest and woodland on sandstone (DAS) – ˜ 31ha;
- *Eucalyptus globulus* dry forest and woodland (DGL) – ˜ 72ha;
- *Eucalyptus ovata* forest and woodland (DOV) – ˜59 ha;
- *Eucalyptus tenuiramis forest* and woodland on sediments (DTO) – ˜52 ha; and
- *Eucalyptus viminalis* grassy forest and woodland (DVG) – ˜ 6 ha (see Appendix 2 for community descriptions).

Saltmarsh areas (˜8 ha) at the mouth of North West Bay River are threatened ecological communities under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC). Wetlands and bogs on the Wellington Plateau are also recognised as important communities.

The area occupied by threatened vegetation communities within the catchment is low representing less than 2.5% of the vegetated areas. It is however recognised that the extent of threatened community areas is likely to be an underestimation (refer to Figures 3 and 4).

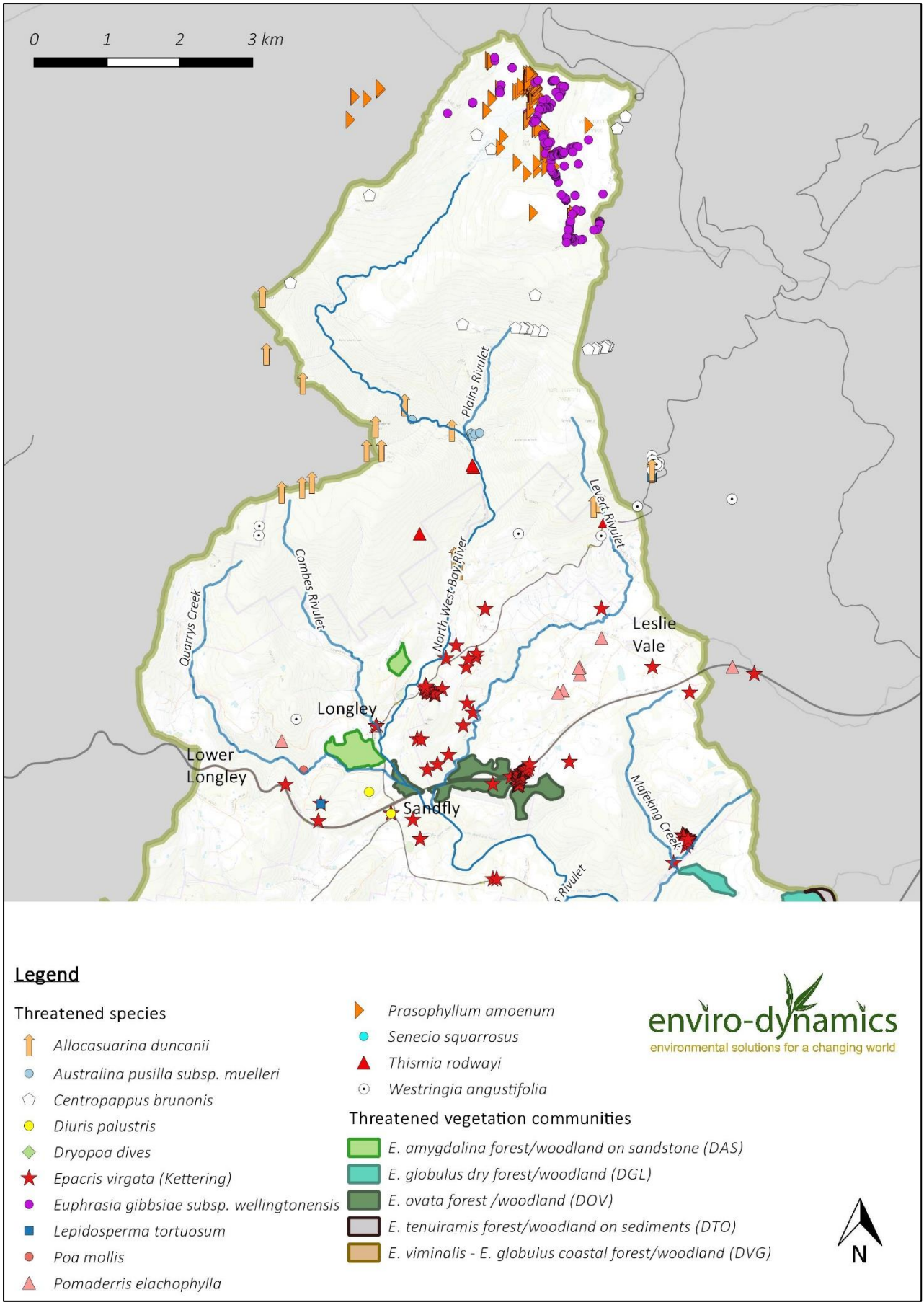


*Figure 3 – Threatened vegetation communities and flora species – northern reaches*

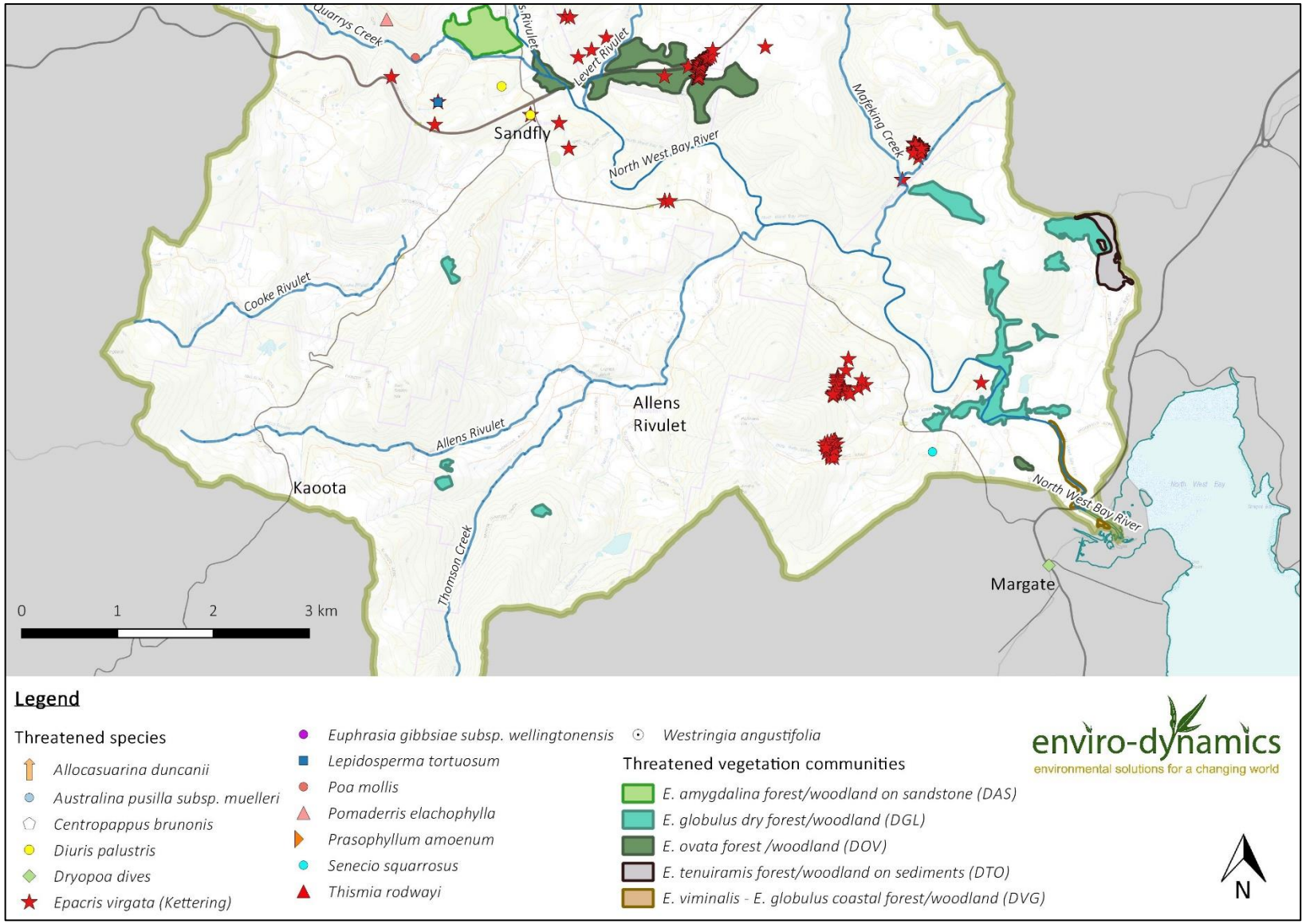


*Figure 4 – Threatened vegetation communities and flora species – southern reaches*

## 2.5 Threatened flora species

There were 13 listed threatened species within the catchment when the 1999 plan was written. Since this time seven of those species have been delisted and a further seven species have been added to the list. Five of the 13 species have been recorded in Wellington Park where wildfire is the most significant threat as these species are fire sensitive. The dainty leek orchid which is known from subalpine sedgeland on the Mountain may also be threatened by climate change.

The additional threatened species recorded in the catchment since 1999 are likely to be a reflection of increased search effort as a result of requirements under the more recent planning schemes. Of the eight species not found in Wellington Park *Epacris virgata* is the most widespread threatened species in the Catchment (Figures 3 and 4). Several significant populations have been recorded since 1999 around the Leslie Vale and Margate areas. Spanish heath thrives in similar habitats to *Epacris virgata* and poses a threat due to its ability to outcompete native species. *Diuris palustris* is listed as endangered under the Tasmanian *Threatened Species Protection Act 1995* but is not listed nationally under the *Environment Protection & Biodiversity Conservation Act 1999*. The two records in the Catchment are from the Sandfly area but are from the late 1800s and it is unlikely that the species remains in the recorded locations which are close to the Huon Highway and are in areas where weed infestation levels are high. *Pomaderris elachophylla* is listed as vulnerable at a State level but is found on the mainland and is not listed at the National level. The remainder of species are listed as rare under the State schedule and are not thought to be under increased pressure since the original plan was written.

Table 2.1 provides a list of the species recorded in the Catchment and provides comments on habitat preferences and threats to each species.

*Table 2.1 Threatened flora species*

| Scientific name | Common name | TSPA | EPBCA | Comments |
|---|---|---|---|---|
| ***Allocasuarina duncanii*** | conical sheoak | r | | Endemic. Records predominantly within Wellington Park and in upper catchment. Main threat to this species is inappropriate fire regime. Fires in close succession are damaging. |
| ***Australina pusilla subsp. muelleri*** | shade nettle | r | | Only known from two small populations is Tasmania on King Island and the southern flanks of Mount Wellington in Wellington Park. Fire is the main threat to this species. |
| ***Centropappus brunonis*** | tasmanian daisytree | r | | Endemic. Known from colonies on the Wellington Range and Mt Dromedary. All records in catchment within Wellington Park. This species is fire sensitive. |
| ***Diuris palustris*** | swamp doubletail | e | | Records from Sandfly area from late 1800s. Recent searches have not found species unlikely to remain in area due to disturbance. Main threats to this |

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| | | | | species are from habitat loss, grazing and inappropriate fire regime. |
| ***Epacris virgata (Kettering)*** | pretty heath | v | EN | Endemic. Found in south eastern Tas. Widespread in catchment where it is associated with *E. pulchella* forest/woodland and *E. ovata* forest/woodland. Threats include weed invasion (Spanish heath in particular), inappropriate fire regime and habitat loss. |
| ***Euphrasia gibbsiae subsp. wellingtonensis*** | Mt Wellington eyebright | r | | Endemic. Restricted to Mount Wellington and is only recorded above 1000m. Climate change is the main threat. |
| ***Lepidosperma tortuosum*** | twisting rapiersedge | r | | Found on mainland Australia and in south eastern Tasmania. Single record from catchment. Habitat is open heathland and woodlands. Main threats habitat loss and grazing. |
| ***Poa mollis*** | soft tussockgrass | r | | Endemic to eastern Tas. Found on dry open hillsides and cliffs. Single record within catchment from 1913. Location is likely to be inaccurate. Grazing and lack of fire are threats to this species. |
| ***Pomaderris elachophylla*** | small-leaf dogwood | v | | Found on mainland Australia and in Tasmania in wet forests. Leslie Vale is a key site for this species. It is not currently known from any reserves. The main threat is habitat loss. |
| ***Prasophyllum amoenum*** | dainty leek-orchid | v | EN | An endemic species only found at Snug Tiers and the Wellington Range, where it grows in sedgey moorland, subalpine sedgeland and bolster heath. All records within catchment from Wellington Park. Main threat is climate change. |
| ***Senecio squarrosus*** | leafy fireweed | r | | Found on mainland Australia and Tasmania in dry woodland communities. Single record within catchment in Margate area. Requires fire every 5-15 years. |
| ***Thismia rodwayi*** | fairy lanterns | r | | Endemic. Occurs in wet eucalypt forests. Records from wet forest in Wellington Park and upper catchment. Threats are inappropriate fire regimes and wildfire. |
| ***Westringia angustifolia*** | narrowleaf westringia | r | | Endemic. Occurs in dry eucalypt forests and is often associated with riverbanks. Scattered records from intact forest in upper catchment. Lack of information on threats. |

## 2.6 Fauna

The North West Bay River catchment is home to 131 animal species including 93 species of birds, 28 species of mammals and 10 species of fish. Five of the bird species, four mammals, one fish and one invertebrate species are listed as threatened under State and/or National legislation (Table 2.2). Four of these species are only found in Tasmania. The eastern barred bandicoot

and eastern quoll are listed at the National level under the *Environment Protection and Biodiversity Conservation Act 1999* but are locally common.

The Catchment also provides habitat for a range of more common but significant species such as the platypus. Their abundance remains unknown in the Catchment but there are regular sightings reported in many of the waterways. Other native species of conservation significance include southern brown bandicoots, long-nosed potoroo, pygmy possums, wombats, and birds such as pink robins and bassian thrushes.

All threatened and common fauna species found within the Catchment rely on large intact areas of vegetation and healthy riparian areas. Threats to habitat from weed invasion and fragmentation are recognised as an important component of this Catchment Plan.

Since the 1999 plan was written the Tasmanian Devil has been listed as endangered under State and Commonwealth schedules due to the devil facial tumour disease (DFTD). A significant number of records for the species occur within the catchment and the all intact vegetation is important to this species. A second strain of the disease ($DFTD_2$) has recently been discovered in devil population in the Snug Tiers in the southern part of the Catchment. Retention of high quality habitat which contains large fallen logs and rocky area for denning habitat are critical for the continuing survival of the species.

Table 2.2 provides a list of the threatened fauna species recorded in the Catchment and provides comments on habitat preferences and threats to each species.

*Table 2.2 Threatened fauna species*

| Species Name | Common Name | State | EPBC | Comments |
|---|---|---|---|---|
| ***Accipiter novaehollandiae*** | grey goshawk | e | | Nests along riparian areas in wet and dry forest, often in blackwoods. Catchment provides good foraging and nesting habitat. Main threat is loss of breeding habitat along watercourse although this appears to be a minor problem in the catchment. |
| ***Aquila audax subsp. fleayi*** | Tasmanian wedge-tailed eagle | e | EN | Four recorded nest sites within catchment. Three sites on northern side of North West Bay River between the Huon Highway and Margate and one nest record from Snug Tiers. |
| ***Ceyx azureus subsp. diemenensis*** | azure kingfisher or azure kingfisher (tasmanian) | e | EN | Endemic in Tas. Habitat includes riparian areas with North West Bay River providing good habitat. Threats are unknown. |
| ***Sarcophilus harrisii*** | tasmanian devil | e | EN | Widespread records across the Catchment. Main threat is facial tumour disease and habitat fragmentation through vegetation clearance. |
| ***Dasyurus viverrinus*** | eastern quoll | | EN | Scattered records across catchment. Main threat is habitat loss. |

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| ***Dasyurus maculatus subsp. maculatus*** | spotted-tailed quoll | r | VU | Isolated records in upper catchment in wet forest. Main threat is habitat fragmwentation. |
| ***Lathamus discolor*** | swift parrot | e | CR | Migratory, breeding endemic. Catchment contains foraging habitat including black gum and blue gums. No nest records. Main threat is loss of breeding hollows and foraging habitat through vegetation clearance. |
| ***Prototroctes maraena*** | australian grayling | v | VU | Record from mouth of North West Bay River. Main threat is reduction in water quality |
| ***Perameles gunnii*** | eastern barred bandicoot | | VU | Common and widespread across catchment. Threats include roadkill and predation by domestic animals. |
| ***Robinella agnewii*** | Silky snail | r | | Records from upper catchment within Wellington Park. Main threat is wildfire. |
| ***Tyto novaehollandiae subsp. castanops*** | masked owl (tasmanian) | e | VU | Endemic. Isolated records in catchment. Main threat is loss of large trees with suitable nesting hollows. |

There has been no significant loss of threatened fauna habitat in the Catchment since the initial plan was written. Some incremental loss of vegetation has occurred, and habitat has been fragmented in some areas as a result of subdivision and development of residence.

# 3 Social values

The majority of the population lives on rural residential, farmland or bushland properties with higher housing densities around the townships of Leslie Vale, Longley, Sandfly and Allens Rivulet. The natural environment and rural character of the Catchment is valued by residents and there is increasing demand for rural residential development. The broader Kingborough Municipality has also been rapidly expanding and there is strong demand for access to outdoor recreation areas within the Catchment.

## 3.1 Recreational values

The river and Catchment are regularly accessed by the residents of Margate, Kingston, the Huon and Hobart as well an increasing number of visitors. Common recreational pursuits within the Catchment include; walking, bike-riding, horse-riding, swimming, fishing, kayaking and climbing.

Kingborough has a significant network of recreational trails across the municipality. These provide essential recreational opportunities for residents and visitors alike. Pipeline Track, Wellington Falls, Cathedral Rock; North West Bay River, Leslie Vale, Allens Rivulet tracks and the Kaoota Tramway are all regularly used trails within the Catchment. They are primarily used for

walking and horse riding, although Leslie Vale Track and Kaoota Tramway are also regularly used for mountain biking.

The development of additional trails within the Catchment to provide linkage between towns and existing trails has been advocated by the local community for many years through the Trail Riders Action Group (TRAC) and residents. In response to the increasing demand for recreational opportunities, the Kingborough Council developed the Kingborough Tracks and Trails Strategic Action Plan 2017 -2022. The plan identifies guiding principles to ensure track development is strategic and supported by the community. There are three 'Priority 1' track proposals in the Action Plan which are of relevance to the Catchment:

1. Allens Rivulet – North West Bay River
2. Longley – Margate link (via North West Bay River) and
3. Kaoota Tramway Track extension – Maudsleys Road/Allens Rivulet link.

The expansion of trail networks within the Catchment will enhance recreational values, increase community engagement and provide broader social and economic benefits. Through the consultation process of this plan the Longley to Margate link along the North West Bay River was raised as a priority. A detailed feasibility study considering the benefits and potential impacts would be required for this trail which is outside the scope of the plan.

There are two community parks in the Catchment in Longley and Sandfly. The parks currently have limited public facilities. Development of additional track networks may require the upgrading of these parks with facilities such as carparking, picnic facilities BBQ facilities and public toilets.

Access to the North West Bay River is limited despite there being extensive areas of Crown Land along the river. Access points to the river which are utilised for swimming, fishing and kayaking include Betts Road; Matthews Road, Longley Park; Huon Highway, Sandfly Reserve; Riverbend Road; Margate Wier; Miandetta Road; Channel Highway at Margate and limited access off Hopsfields Road. Popular swimming holes are accessed at Matthews Road (Figure 5), Sandfly Reserve and Miandetta Drive and access to the river for kayaking occurs at Huon Highway and Channel Highway during high flow events. An informal picnic area also exists close to the Longley Hotel where Huon Road crosses the North West Bay River.

*Figure 5 – Popular swimming hole accessed from Matthews Road.*

The Dogleg bend cliffs are a well-known climbing spot. There are two dolerite crags with multiple routes. Rock hopping along the river is also regularly undertaken for swimming, fishing and climbing purposes. Allens Rivulet is accessed from a Council managed reserve at Crofton Drive, Moody Road and Allens Rivulet Road. There are no formal public access points to other waterways in the Catchment.

## 3.2 Cultural Heritage

### 3.2.1 Aboriginal heritage

A desktop search of the Aboriginal Heritage Register by Aboriginal Heritage Tasmania of the broader North West Bay River Catchment revealed that there two registered sites close to the Channel Highway in Margate. The relative absence of registered Aboriginal sites within the North West River Bay catchment is not a reflection of the use of, or importance of North West Bay and the river for the Tasmanian aboriginal people. The lack of known heritage sites within the catchment is more likely due to limited survey effort.

Resourced consultation is recommended to be undertaken as an action of this plan to learn the importance of the area to Tasmanian Aboriginal people past and present, incorporate their connection to and aspirations for the management of the catchment.

### 3.2.2 Non-indigenous history

European settlers had a presence in the North West Bay River Catchment from the beginning of Hobart's settlement in 1803. The Catchment has provided access to clean water, timber, minerals and food in the form of game and shellfish for early settlers. The upper catchment was used to provide water to Hobart from 1901 when the pipeline from the North West Bay River was completed. Resource extraction in the Catchment included timber cutting and coal mining. The coal industry operated in the Kaoota area from 1881 until 1971, with a tramway rail link built to transport the coal and timber to Margate. This industry led to an increase in the population of the area, with land being cleared for agriculture and settlement. The tramway was later used to transport goods to settlers in the area.

# 4 Threats to values

## 4.1 Climate change

Climate change threatened a number of values within the Catchment. The Kingborough Council recognises that climate change presents a material risk to Council assets and operations and has the potential to impact the economic, social and environmental viability of the region (Kingborough Council Climate Change policy 2017). More extreme events have been recorded over the latter half of the 20th century, coinciding with changes to climate. The extreme weather events are expected to increase in frequency and intensity with higher maximum and minimum temperatures, i.e. more hot days and fewer cold days, and more intense rainfall likely (Fox-Hughes *et. al* 2015). Climate change may impact vegetation communities and individual flora species. Changes in temperature may led to an increase in the extent of some species and the retreat of others in particular with subalpine species in Wellington Park.

Extreme events such as high rainfall will contribute to increased erosion risk along waterways and roadways within the Catchment as experienced in June 2018. Sea level rises associated with climate change will impact the estuarine areas in North West Bay with saltmarsh areas most at risk. Future planning for these events must include provisions for retreat pathways for saltmarshes which may impact on land that is currently used for agriculture.

## 4.2 Fire

Fire is an ever-present risk in Tasmania's hot dry summers. The increased bushfire regulations reflect the high level of risk for catastrophic fires. Fire danger is increasing with climate change (Fox-Hughes *et. al* 2015). The number of high fire danger days is predicted to increase. Fire can have catastrophic impacts on native animal and plant communities. Increased temperatures and extended dry periods can dry out areas of wet forest and make them more susceptible to fire. Wet forest and rainforest contains species that are not adapted to fire and hence the composition of these forests may change following more frequent fires. Managing risk of fire impacts requires a clear plan for control burning that considers both human safety and ecological community constraints. As indicated in the threatened species tables in Section 5, fire is often a leading threat or a management requirement.

Fire can also contribute to increased erosion risk when a high rainfall event follows a fire. There is potential for increased sediment loads to enter waterways due to soil erosion and acidity from ash. The combination of these events could have a significant impact on the Catchment health.

Bushfire management plans exist for Wellington Park and the Catchment fire risk has been assessed as part of the Fire Protection Plan 2017 for the Southern Fire Management Area. These plans include some control burns aimed at reducing the bushfire threat to life and property and are prioritised around community areas such as Sandfly. The impacts of prescribed burns on natural values and water quality are generally a secondary consideration. Whilst wildfire is difficult to prevent within natural systems the impacts of large fires can be minimised by managing natural areas to be resilient. This includes retaining riparian vegetation cover along waterways to act as a filter following fire, keeping natural area free of weeds and controlling weeds after fire events to minimise their spread. Weed management should also form an important part of prescribed burn programs to maintain the values of the vegetation that is burnt.

## 4.3 Threats to natural values

### 4.3.1 Biodiversity and habitat loss

The single biggest impact on biodiversity is habitat loss (Hanski 2011 & others). Habitat loss can take many forms for example clearing for conversion to agriculture, forestry and urbanisation. In the Catchment there has been a general change in land use from agricultural and natural areas to more rural residential development in recent years. Kingborough Council have developed strong vegetation and waterway protection regulations since the 1999 plan was written however vegetation loss for new dwellings and associated bushfire hazard management still occurs. This type of development results in overall fragmentation of natural areas. Habitat fragmentation refers to the breaking apart of habitat typically associated with land clearing. Habitat fragmentation has different impacts on species, depending on their individual requirements. It is typically associated with creating isolated patches of habitat which make it difficult for species to move across the landscape. It also exacerbates edge effects such as the invasion of weeds from disturbed areas into bushland areas and can be linked to species loss and extinction in extreme cases.

The impacts of habitat fragmentation and loss in the Catchment are likely to have the greatest impact on threatened species and vegetation communities. One of the biggest changes to an area where rural residential development is occurring (beyond habitat loss and built infrastructure impacts) is the number of introduced species which are brought into an area. There are many garden escapees which become weed threats and weed invasion is the most widespread threat to natural values. Other threats associated with increased development and habitat loss is the increased vulnerability of fauna to predation by domestic animals (cats and dogs).

### 4.3.2 Domestic animals

Cats are excellent hunters and are known to predate on native wildlife. Both domestic and feral cats present a problem for wildlife. Feral cats are listed as a key threatening process

under the National threatened species legislation due to the predation of native species and the ability to spread disease to native species including bandicoots (toxoplasmosis). There are limited responsibilities for cat owners under the Tasmanian *Cat Management Act 2009*. The Act covers allowable actions in rural areas for the control of cats. A policy of keeping cats indoors, de-sexing and microchipping cats and being mindful of the impacts of your cats is an important step towards reducing the impacts on native wildlife. Kingborough Council is working to promote responsible cat ownership and to reduce the impact of cats on wildlife & neighbours.

Dogs can also present a problem to wildlife when not managed responsibly. Responsible ownership is defined under the Council dog management policy which aims to ensure that dogs are kept under effective control. The impact of a single animal may be limited but cumulatively, domestic animals that are not controlled can have a significant effect on wildlife populations.

### 4.3.3 Weeds

Weed invasion is a constant and recurring issue across the landscape. There are widespread weed infestations across the Catchment on private and public land. Weeds are spread along roadways (by vehicles and machinery), by birds and native mammals and along waterways. Stock, horses and mountain bikes can also contribute the spread of weeds through bushland areas. This plan focuses on maintaining special values and riparian health as well as ensuring previous weed control efforts are followed up.

The plan aligns with the recommendations of the Kingborough Weed Management Strategy and Action Plan 2017-2017 in the context of the Catchment values and asset protection within the Catchment. It is recognised that all declared weeds legally require control. However, due to the scale and scope of some declared weed infestations within the Catchment priorities for the control under this plan have been based on protection of high biodiversity values, weed distribution and ability to effectively control. All weed control actions will need to be coordinated with private landholders and other public land managers such as State Growth and Crown Land Services to be effective.

The management strategy for non-declared weeds recommended in the Kingborough Weed Strategy has been applied to non-declared weeds in the Catchment. The strategy broadly considers the feasibility of control costs versus the relative risk to high value assets and existing weed free areas.

It should be noted that no comprehensive weed surveys were undertaken as part of this update. Weed databases held by the NVA and Kingborough Council were interrogated and weed officers with the Kingborough Council were consulted to develop a list of priority weeds for control under this plan update.

The following weeds have been identified as high priority weeds within the catchment;

Weeds of National Significance (WoNS) – national listing for weeds based on their invasiveness, potential for spread and environmental, social and economic impacts;

Declared weeds – as listed under the *Weed Management Act 1999*.

Zone A and B weeds – refers to municipality wide control strategies under Statutory Weed Management Plans. Zone A weeds are those within municipalities where eradication is the principal management objective and Zone B weeds are those where containment is the principal management objective.

Invasiveness of weeds – species capable of invading intact native vegetation were also listed as higher priority for control than those that require disturbance or vector such as roadsides to spread

*Table 4.1 - Key weeds identified within the Catchment:*

| Weed Species | | WoNS | Declared (WMA) | Invasiveness | Zone | Priority KWMS |
|---|---|---|---|---|---|---|
| Common Name | Species name | | | | | |
| Willows | *Salix* spp. | Y | Y | High | B | 3 and 4 |
| Montpelier Broom | *Genista monspessulana* | Y | Y | High | B | 4 |
| Spanish heath | *Erica lusitanica* | N | Y | High | B | 4 |
| Elisha's Tears | *Leycesteria formosa* | N | Y | High | B | 4 |
| Ragwort | *Senecio jacobaea* | N | Y | Moderate | B | 4 |
| Patersons curse | *Echium plantagineum* | N | Y | Moderate | A | 2 |
| African Feathergrass | *Pennisetum macrourum* | N | Y | Moderate | A | Not listed |
| Karamu | *Coprosma robusta* | N | Y | High | A | 1 |
| Darwins Barberry | *Berberis darwinii* | N | Y | High | A | Not listed |
| Holly | *Ilex aquifolium* | N | N | High | n/a | 1 (KNPW) |
| Foxglove | *Digitalis purpurea* | N | N | Moderate | n/a | Not listed |
| Montbretia | *Crocosmia Xcrocosmiiflora* | N | N | Moderate | n/a | Not listed |

KWMS – Kingborough Weed Management Strategy; KNPW – Kingborough Non-declared Priority Weeds

Willows – *Salix* spp.

Most species of willow are classified as weeds of national significance (WoNS) due to the economic and environmental impacts of the species. Willows have a detrimental impact on water quality and stream health. They reduce flow with their shallow spreading root systems and input large amount of organic matter into streams. This organic matter results in the leaching of toxic chemicals into aquatic systems impacting macro invertebrates (waterbugs). They create oxygen poor environments that can impact on fish and insects within streams. They also create shallow and wider channels in streams. They use more water than native species, an estimated 5.5 megalitres/hectare/year (Aust Govt 2008). Refer to Figure 6 for an indication of the distribution of willows in the Catchment.

Crack willow was identified in the 1999 plan as a major management issue and significant effort and resources were invested into the mapping and control of this species within the Catchment. Primary control of crack willow was undertaken along most waterways and the majority of the North West Bay River (down to Blue Gate Rivulet). Follow-up control over

constitutive years occurred in all areas that had primary treatment. The initial willow control program and follow-up works were identified by the community as a major success of the Catchment plan during the 2013 review process. Due to the previous investment in control of crack willow, follow-up of any regrowth is seen as a high priority and an achievable action for this plan.

Grey willow, also known as seeding willow is one of the most invasive willow species due to its ability to produce vast amounts of seed (Smee, 2008). Grey Willow has a limited distribution in Tasmania and is a priority weed due to its potential to rapidly invade areas. Kingborough Council NRM staff have expressed concern about its perceived expansion in the region (and catchment) and recommend more detailed surveying to determine the extent of the issue (*Figure* ).

Montpellier/Canary Broom – *Genista monspessulana*

Montpellier broom is relatively widespread in the Catchment, particularly along roadsides. There are also significant infestations with the North West Bay Rover south of the Huon Highway. Larger infestations within the Municipality, such as along Leslie Road, have been treated using a biocontrol. The psyllid, *Arytinnis hakani*, is a sap sucking bug which has proven useful in reducing the density of large populations, but it is unlikely to prevent the gradual progression of the weed through the Catchment. The upper catchment contains only isolated infestations of canary broom and as such there is an opportunity to limit its further spread though targeted control. The control of isolated specimens along Leslie Road west of the Huon Highway, Huon Road (south of Leslie Vale Road) and Betts Road and Riverdale Road and along the North West Bay River north of the Huon Highway are higher priorities.

Spanish Heath – *Erica lusitanica*

Spanish heath is a highly invasive weed that is a prolific seeder and can also spread from broken stems and roots. This species is widespread and abundant in the Catchment particularly along roadsides where it can be spread by roadside maintenance and stormwater runoff. It also has the potential to invade intact shrubby woodland and heathy communities, outcompeting native species. Due to its widespread distribution within the Catchment eradication is not considered to be feasible.

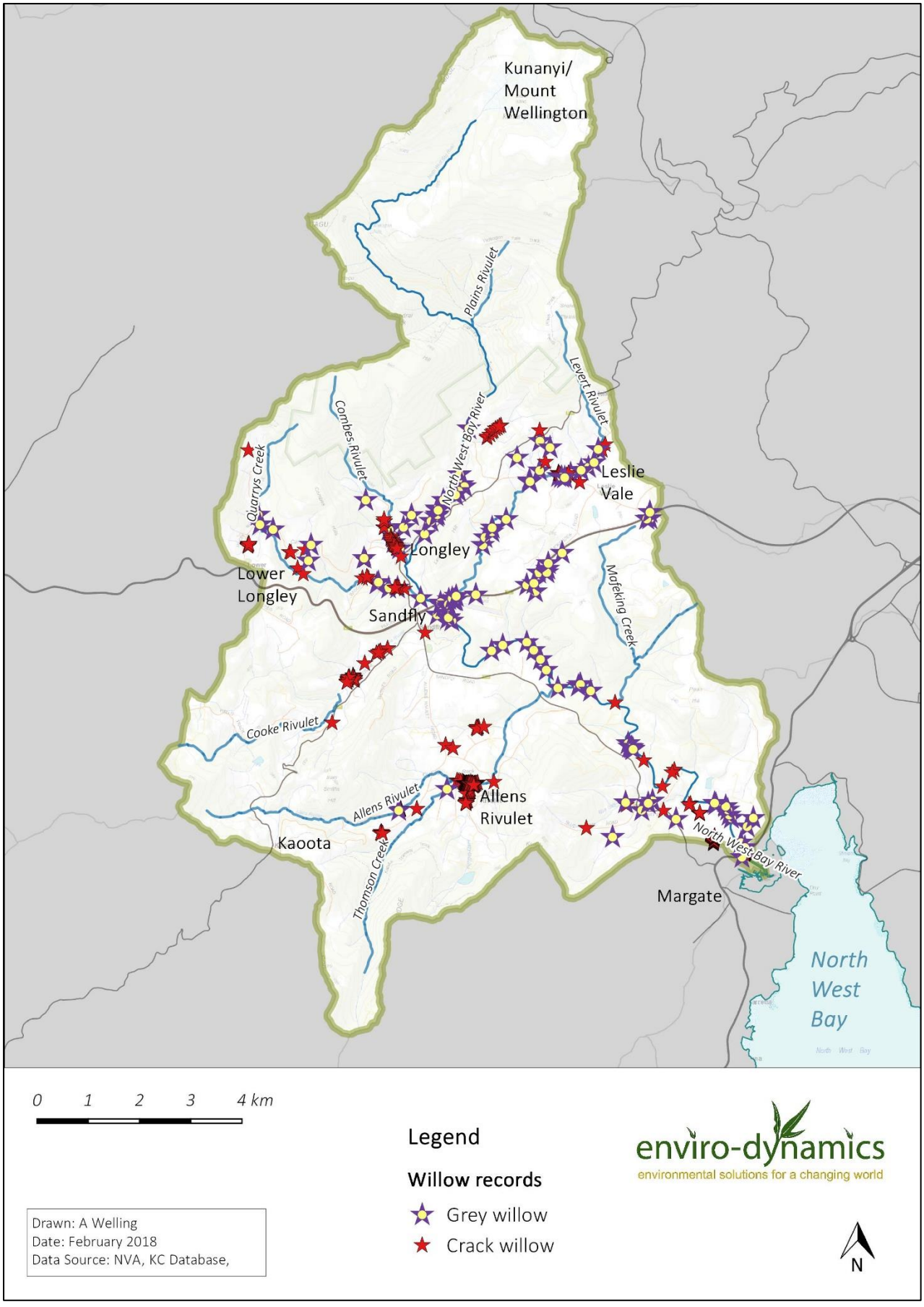


*Figure 6 – Willow records (some records may have been controlled).*

The ongoing control of infestations along roadsides by the Kingborough Council and State Growth is required to limit the further spread. This should involve control of existing infestations, improved weed hygiene practices and stormwater management.

Control actions for Spanish heath relate to the protection of high conservation values such as threatened vegetation communities and threatened flora. It is recommended that containment lines are established around high value conservation areas. In particular, efforts should be made to control spanish heath around threatened shrubby Eucalypt communities (such as DOV) and populations of the endangered *Epacris virgata*.

Elisha's tears – *Leycesteria formosa* (Declared weed)

Elisha's tears invade cool moist forests, woodlands and riverbanks in both disturbed and undisturbed bush. It can form dense thickets that smother other vegetation and prevent regeneration. Elisha's Tears is listed as widespread within the Kingborough municipality however only isolated occurrences have been recorded in the Catchment. Further mapping of the species along waterways is required to determine its control priority.

Ragwort – *Senecio jacobaea*

Ragwort is a highly invasive weed that invades productive areas and can be toxic to stock. There are scattered records from the Sandfly and Allens Rivulet areas. Some control has been undertaken by Kingborough Council. Ongoing treatment of isolated plants within the catchment is recommended.

Patersons curse – *Echium plantagineum*

Patersons curse records are limited to the lower end of the Catchment around the Channel Highway. Monitoring of control sites and treatment of isolated plants is recommended.

African Feathergrass – *Pennisetum macrourum*

A single population of African Feathergrass have been discovered (and treated) in Longley between Huon Road and North West Bay River opposite Matthews Road. Ongoing management is required.

Darwins Barberry – *Berberis darwinii*

Two populations of Darwins Barberry were discovered (and treated) in Longley. Multiple plants were recorded on eastern side of North West Bay River opposite Matthews Road in dense riparian vegetation. Council will monitor the area. Survey downstream of this location also recommended when specie is flowering (difficult to identify at other times of year).

Karamu – *Coprosma robusta* and Holly – *Ilex aquifolium*

Both species known from Ferntree and Neika. Have potential to invade intact wet forest and as such pose management problem within upper end of catchment. Karamu has ability to spread along waterways.

**Non-declared weeds**

The following non –declared weeds have been identified in this plan as having limited distribution in the upper Catchment. Control of these weeds in the upper reaches of the North

West Bay River in particular may prevent these weeds from becoming widespread and more difficult to control.

Foxglove – *Digitalis purpurea* (Environmental weed and garden escapee)

Foxglove is an environmental weed which invades naturally open areas in cool, damp and shady habitats. Foxglove is also an extremely poisonous plant and can be difficult to control. This species appears to be increasing in distribution in the upper end of the Catchment (below Wellington Park) and is a threat to the North West Bay River due to its habitat preference and known proximity to the river. Management of foxglove in the upper catchment is considered to be a high priority.

Montbretia – *Crocosmia Xcrocosmiiflora* (Environmental weed and garden escapee)

Montbretia similarly has been increasing in distribution throughout Tasmania. Montbretia is a difficult weed to control as it disperses by rhizomes and corms in water, garden waste and contaminated soil. Montbretia can form dense clumps invading grasslands, roadsides, streamside and forests, particularly in cool moist environments. This species is a threat to stream side and riverbed environments in the Catchment where it can form dominant patches outcompeting native species. There are widespread occurrences of this species along the North West Bay River however its density along the river does not appear to be increasing rapidly. Management of montbretia in the upper catchment (north of the Huon Highway) is considered to be of higher priority than the lower catchment where the weed is more widespread and difficult to control.

## 4.4 Water quality impacts

### 4.4.1 Erosion and sedimentation

Erosion and sedimentation have significant impacts on water quality as they alter the conditions of life within the river for plants and animals. The environmental impacts of sedimentation include: loss of important or sensitive aquatic habitat, decrease in fish populations, loss of recreation attributes, human health concerns, changes in fish migration, increases in erosion due to river channelling, loss of wetlands, nutrient balance changes, increases in turbidity, loss of submerged vegetation and coastline alteration.

The health of riparian vegetation is a key component of maintaining water quality and reducing erosion. Riparian vegetation is largely intact along the majority of the North West Bay River and most of its tributaries. Some sections of Allens Rivulet, Cooke Rivulet and the lower end of the North West Bay River have been cleared to the river's edge for farming. Erosion and landslips were raised as threats to water quality and bank condition in the past plan. Some erosion events have been recorded since the last catchment plan was produced; mostly small slips and impacts associated with flood events. A detailed assessment of river bank condition has not been conducted and is recommended to determine if there are any current issues or high erosion risk areas requiring future management. This is particularity relevant following the June 2018 flood event.

Run-off from roads and drains can also contribute to sedimentation of waterways in the Catchment during heavy rain events. The effects of run-off have not been quantified. An assessment of the amount of material put onto gravel roads by Council annually in the Catchment may indicate the extent of this problem.

### 4.4.2 Nutrients and run-off

Nutrient run-off occurs when there are excessive inputs into waterways, usually nitrogen or phosphorus, which act to stimulate algal growth. Sources of nutrient run-off are often associated with grazing practices and discharges from septic tanks and feedlots.

Livestock such as sheep, cattle and alpacas are kept on small holdings throughout the Catchment. Many properties also keep horses with horse riding as an important recreational pursuit in the Catchment. All livestock have the potential to alter the landscape and impacts can include: habitat alteration (damage to vegetation), soil compaction, stream bank erosion, nutrient run-off and introduction of weed species. Stock access to waterways was identified as an issue in the 1999 plan and funding grants were gained to fence off some riparian areas along Cooke Rivulet. While stock access to the waterways appears to have been reduced, an assessment of unfenced waterways within the Catchment would inform future actions.

Waste-water systems are also likely to be contributing to nutrient levels in waterways. Diffuse pollution from septic tanks is often underestimated. The impact depends on the site and the maintenance of the septic system (Withers *et. al* 2013). Studies have shown that the higher the density of septic systems, the higher the instream nutrient levels within catchments (Gardner *et. al* 2005). It is difficult to quantify the impacts consistently as they are affected by geology and other catchment characteristics. Aerobic water treatment systems are a better option for un-sewered catchments despite their impact on nitrate and nitrogen levels. The density of on-site treatment systems, be they septic or aerobic water treatment systems, is the determining factor on the level of impact.

Whilst the number of systems within the catchment is generally low, poorly maintained septic or aerobic systems nearby to waterways are likely to be contributing to nutrient levels. Regular maintenance of septic systems and aerobic systems is required for them to function efficiently. Impacts of wastewater systems from future residential development within the catchment is likely to be limited. Tighter planning restrictions for development within or adjacent to waterway protection areas and stricter wastewater system design requirements will minimise the impacts of the broader environment.

Limited monitoring of water quality within the catchment has been undertaken in the past. Regular baseline monitoring is required to identify any increase in nutrient levels and any changes tracked over time.

## 4.5 Water quantity impacts

A significant amount of water is diverted from the upper catchment for the Hobart drinking water supply through an existing water allocation (annual allocation of 15000 ML). This source of drinking water provides up to 20% of Hobart's water supply and requires low treatment

levels. It is also the only supply for Fern Tree and Ridgeway. The majority of the water is collected during periods of low flow.

An assessment of the environmental values of the North West Bay River catchment (CFEV 2015) (derived from an interrogation of the Conservation of Freshwater Ecosystem Values (CFEV) database), looked at the impacts of water extraction in the upper catchment. The assessment provided the following summary '*Below the weir a fluvial geomorphic river type has been identified as the primary conservation value for most river sections. The conservation value of this feature is unlikely to impacted by flow diversion in the upper catchment as the flow drivers for fluvial process are predominantly in the high/flood flow regime and are essentially natural given the low amount of storage in the catchment. This means that the flow regime is unregulated and retains all higher flow components. Deleterious effects on this feature which have occurred are a result of modern land use practices, which include clearing of native riparian vegetation, weed invasion, bank modification and gravel extraction. The effect of these practices has been a loss of bank stability in the middle to lower reaches, and may have caused a straightening and deepening of the channel in the lower reaches (Telfer, 2001).*'

There are an additional 36 water allocations within the Catchment below the TasWater weir (DPIPWE 2018). These allocations are predominantly for agricultural purposes. Whilst it is unlikely that these allocations are fully utilised, currently allocations for the river are considered to be over allocated (DPIPWE, 2018). More intensive agricultural use in the lower end of the Catchment has occurred in the recent past and may expand in the future.

Additional water extraction from the catchment includes groundwater bores, small farm dams and direct unallocated takes from smaller tributaries. The quantity of water extracted from these sources is unknown as are the impacts on the catchment values. Future rural residential development within the catchment is likely to result in the construction of additional small farm dams and the extraction of more water from the system.

## 4.6 Recreational impacts

Recreation planning needs to consider the potential impacts of over use. These impacts can include track and site compaction and erosion, nutrient run-off and damage to vegetation from lack of defined paths and areas. River access points, especially where there are swimming holes, experience high levels of visitation during hot weather. Facilities at these sites are generally inadequate with parking congestion and a lack of toilets and rubbish bins. These issues can negatively impact on local residents.

Whilst a growth in demand for recreational opportunities has been identified as part of this plan update, projected impacts also need to be considered and managed as part of any future recreational developments. Increased development of tourist accommodation (camping and units) will also increase demand for use of the river for swimming and walking. Increased demand from visitors should also be included in long term planning.

## 4.7 Land use planning changes

Since the writing of the 1999 plan new planning scheme controls have come into effect that improve the identification and protection of environmental values. Most areas of intact vegetation are now within Biodiversity Protection Areas and all waterways are within Waterway Protection Areas under the Kingborough Interim Planning Scheme 2015. These planning controls have provided improved environmental outcomes as surveys for values and management of any impacts of development applications are required.

The 2105 planning scheme also includes a Bushfire-Prone Areas Code. This Code and Bushfire Hazard Regulations stipulate minimal hazard management zones around new dwellings which has led to an increase in vegetation clearing and caused some fragmentation of intact landscapes.

The new Statewide Planning Scheme is due to be applied to the State in the near future. One of the biggest changes in the proposed Statewide Planning Scheme is the removal of the Biodiversity Protection overlay from land zoned as agricultural land. This has the potential to have significant implications for Kingborough and the Catchment area as up to 40% of catchment may be zoned as agricultural land. Under this proposal large areas of the Catchment may no longer be scrutinised for important values prior to development. It is noted that large scale land clearance for timber harvesting or agricultural land will continue to be managed through the Forest Practice Code.

# 5 Priorities and actions

## 5.1 Prioritisation process and sphere of influence

Whilst the 1999 Plan and the review recommendations have been considered, this plan focuses on tangible projects where actions can be successfully implemented. For example, it is highly unlikely that the level of water extraction in the upper catchment for the Hobart drinking water supply can be influenced through the plan, whereas the follow-up management of crack willow can be achieved to build on previous work.

Actions identified in the plan have been prioritised through the consideration of:

1. the level of threat
2. the stakeholder concern; and
3. the capacity to address the impact as defined below.

The prioritisation of actions will also be influence by community input and as such the priority of each action may change in the final plan.

The context of each threat and capacity to address is then outlined in Section 4 of this Plan. In some instances, capacity to address the threats is based around protection of specific values rather than addressing the threat on catchment wide basis. For example, spanish heath is widespread and beyond the capacity to address on a catchment wide basis. However, in the context of threatened species management active control can reduce the threat.

The following outlines scoring protocols used to determine priorities as shown in Table 5.1.

**1. Level of threat**

Unknown – lack of quantitative evidence (score of 0)

Low – will have isolated impact on values (score of 1)

Moderate – will have widespread and degrading impact on values (score of 2)

High – currently has a widespread degrading impact on natural values (score of 3)

**2. Stakeholder concern**

Low – mentioned but not highlighted as a concern (score of 1)

Moderate – mentioned by an individual as a concern (score of 2)

High – mentioned by multiple stakeholders as a concern (score of 3)

**3. Capacity to address the threat**

Low – very limited capacity to address threat (score of 1)

Moderate – potential to minimise and or contain threat (score of 2)

High – potential to eradicate threat/issue (score of 3).

**4. Final Priority Score**

Low = score of < 4

Moderate = score of 4–7

High = score of >7

*Table 5.1 Prioritisation of actions*

| Identified issues | Level of threat | Stakeholder concern | Capacity to address impact | Final score and ranking |
|---|---|---|---|---|
| **Climate change** | Unknown (0) | Moderate (2) | Low (1) | Low (3) |
| **Fire** | Low (1) | Moderate (2) | Moderate (2) | Moderate (5) |
| **Natural Values** | | | | |
| Biodiversity & habitat loss | Low (1) | High (3) | High (3) | High (7) |
| Domestic animals | Low (1) | Moderate (2) | Low (1) | Moderate (4) |
| Weeds - Willows | High (3) | High (3) | High (3) | High (9) |
| Canary Broom | Moderate (2) | Moderate (2) | Moderate (2) | Moderate (6) |
| Spanish heath | Moderate (2) | Moderate (2) | Moderate (2) | Moderate (6) |
| Zone A weeds | High (3) | Moderate (2) | High (3) | High (8) |
| Other declared | Moderate (2) | Moderate (2) | Moderate (2) | Moderate (6) |
| Non-declared | Moderate (2) | Low (1) | Moderate (2) | Moderate (5) |
| **Water quality** | | | | |
| Erosion and sedimentation (bank health) | Unknown (0) | High (3) | Moderate (2) | Moderate (5) |

| | | | | | |
|---|---|---|---|---|---|
| | Run-off/nutrients | Low (1) | Moderate (2) | Low (1) | Moderate (4) |
| | Livestock | Low (1) | Low (1) | Moderate (2) | Moderate (4) |
| **Water quantity** | | Unknown (0) | High (3) | Low (1)) | Moderate (4) |
| **Revegetation maintenance** | | Low (1) | Low (1) | Moderate (2) | Moderate (4) |
| **Land use & planning** | | Low (1) | Low (1) | Low (1) | Low (3) |
| **Recreation** | | | | | |
| | Recreational opportunities | Low (1) | High (3) | Moderate (2) | Moderate (6) |
| | Recreational impacts | Low (1) | Moderate (2) | High (3) | Moderate (6) |
| **Community Input** | | High (3) | Moderate (2) | High (3) | High (8) |

## 5.2 Key actions required to address threats to values

The key actions required to address the threats identified in this Plan are provided below. Actions are ranked by prioritisation score as per Table 5.1. Issues with low scores are generally excluded except where they do not have associated costs. All actions are highlighted at the end of each section and summarised along with responsibility for each action in Table 5.2.

Additional actions that relate to the budgetary and implementation aspects of the plan are also provided.

### 5.2.1 Weeds

Willow management was identified by the working group, by key stakeholders and by Council staff as the number one issue for management. This has arisen because significant resources have been spent on willow control works in the past with good outcomes. There is a need to re-treat areas where willows are regrowing to ensure that the investment so far is not undermined. There is a risk of grey willows expanding their distribution which has the potential to significantly impact the catchment. A survey of willow distribution in the catchment and control works where practical is critical.

***W1 – Re-survey crack willows along waterways in catchment – assess areas where willows previously removed for bank stability and need for active revegetation***

***W2 – Control identified crack willow along waterways including regrowth***

***W3 – Map grey willows within catchment as part of broader municipal wide mapping***

*Spanish heath* was identified by the working group and by key stakeholders as a risk to threatened flora. Establishment of containment lines around known threatened species populations and control of infestations within populations is a high priority action. This will include coordinated control with landholders.

***W4 – Define location of containment lines for Spanish heath control***

***W5 – Control Spanish heath within or adjacent to known threatened species populations in conjunction with landholders***

*Canary broom* has a limited distribution in the upper catchment and the highly invasive nature of this plant means it is a priority for control. Targeted control along roadsides around the upper catchment is recommended. Control of isolated specimens along roadsides west of the Huon Highway at Leslie Vale is required to control spread of this weed across the upper catchment.

***W6 – Undertake targeted control of Canary broom along roadsides in upper catchment***

All Zone A weeds identified in Table 4.1 are a high priority for control to prevent them from establishing within the Catchment. African Feathergrass and Darwins Barberry are known from single locations and are currently being controlled by the Kingborough Council. Ragwort is to be managed as per the Kingborough Weed Management Strategy. Karamu may be an emerging threat and therefore public education will be key to the control of this and other Zone A species (see W12).

***W7 – Monitor and control African Feathergrass and Darwins Barberry population at Longley***

*Elisha's tears* – There are isolated records of this species within the Catchment. It is recommended that additional surveying along the rivers is carried out during willow mapping. Depending on the extent of the survey findings, strategic control of plants should be undertaken with infestations in the upper catchment a higher priority.

***W8 – Map Elisha's tears along waterways during willow mapping***

***W9 - Control isolated Elisha's tears plants (in conjunction with landholders)***

*Montbretia* – Control of this species in the upper catchment where it is sparse is recommended.

***W10 – Control isolated montbretia infestations in upper catchment***

*Foxglove* – currently limited in distribution but appears to be increasing. It has the potential to spread rapidly in wet and riparian areas. It is recommended that landowners be encouraged to control foxglove in the upper catchment above the Huon Road Bridge at Longley.

***W11 – Encourage control of foxglove in private land in upper catchment.***

A weed education program for all landholders is an important component of all weed management actions. Providing information on current and emerging weeds, their threat to the Catchment and methods for control can have a significant impact on weed management within the catchment.

***W12– Undertake weed education programs to private landholders through mailouts, public events and on-line methods.***

### 5.2.2 Biodiversity and habitat loss

The threat to biodiversity and habitat loss within the catchment is influenced by planning controls.

A key limitation to developing a management strategy for special values is a lack of knowledge of the full extent of threatened communities. It is recognised that the current mapping does not adequately cover all known areas of threatened communities and additional surveying and mapping is required to address this information gap. This mapping could influence planning decisions in relation to the new State-wide Planning Scheme as the extent of the biodiversity protection layer will be restricted to mapped threatened vegetation communities across some zone categories.

***B1 – Map additional threatened vegetation communities.***

### 5.2.3 Recreational opportunities

A common, recurring theme in the stakeholder consultation was the development of connecting trails and further recreational opportunities for residents and visitors. This includes picnic areas

and access points on the river, potential camping areas and promotion of the outdoor recreational opportunities.

The development of a trail link from Longley to Margate is supported in principal in this plan provided a comprehensive feasibility plan is conducted to assess natural values, manage impacts, negotiate access and provide detailed costings for the project.

***RO1 – Undertake feasibility study for track link along North West Bay River from Longley to Margate.***

Provision of improved access, picnic and camping areas and the promotion of the regions outdoor recreational opportunities should be addressed through a comprehensive Recreation Plan for the Catchment or region however this is outside the scope of this plan.

### 5.2.4 Recreational Impacts

The condition and capacity of existing river access points and facilities along the river should be assessed. These areas are likely to experience an increase in usage as the population in the region increases. As such, assessments to determine if upgrades to tracks, car parking and picnic facilities are required to protect values. Assessments will need to consider peak usage times such as hot days.

Impacts of recreation from increased visitor numbers within the catchment need to be considered in future planning.

***RI1 – Future recreational planning within the Catchment to consider river access points and facilities and impacts of increase visitor usage.***

### 5.2.5 Water quality monitoring

There is limited information available on water quality and how the catchment is changing. A long-term water quality monitoring site has recently been established by DPIPWE at the Channel Highway at the bottom of the Catchment. This monitoring site will measure river condition based on macro invertebrates and whilst it will provide an ongoing record of river health is will not measure nutrient levels or contaminants. Regular and ongoing water quality assessment is important in building understanding on how the Catchment is changing overtime especially in light of increased population and climate change impacts. This monitoring should be established as a partnership between land managers including the Council and DPIPWE.

***WQM1 – Establish long-term water quality monitoring station/s in the catchment.***

The condition of the river in relation to erosion and bank stability has not been comprehensively addressed for over a decade. An updated geomorphological assessment of bank and river condition is recommended to address this gap.

***WQM2 – Government management agencies to investigate formal geomorphological assessment of river banks.***

***WQM3 – Undertake survey as funds allow.***

Water quality monitoring can be used as a tool to re-engage the community with the catchment health. Programs such as WaterbugBlitz can be used to assess invertebrate populations and increase community involvement.

***WQM4 – Investigate water quality monitoring WaterbugBlitz (or similar) program for Catchment.***

### 5.2.6 Water quantity and management

Levels of water extraction for drinking water in the upper catchment provide an important part of Hobart water supply and it is highly unlikely that quantities of water collected will alter. This is deemed to be an issue outside the scope of a Catchment Management Plan and as such received a lower priority for action.

Flow rate data has been collected from the Margate Weir site since 1965 however this data collection has been intermittent since 2001. Limited flow rate data has been collected from the upper catchment. A cumulative impact assessment is over-due.

It is recommended that a Water Management Statement in prepared.

***WM1 – Seek Water Management Statement for North West Bay River from DPIPWE***

### 5.2.7 Fire

Minimising the threat of fire on the catchment health is largely beyond the scope of this plan. It is recommended however that Council provide input into broad scale fuel reduction management to ensure the protection of catchment values is included. Management of weeds prior to and following burns is also an important aspect of planned burns and discussion with landholders should include this aspect.

***F1 – Council to provide input into TasFire regional or landscape fuel reduction plans. Tasfire to factor in weed management actions as part of planned burns including post fir control.***

### 5.2.8 Revegetation maintenance

Revegetation works were undertaken on public and private land as part of grants received to implement the 1999 Plan. These works were supported by community groups, schools and the Council. Revegetation projects aimed to revegetate streamside areas where weed control works were undertaken and reintroduction of native vegetation and habitat to stream banks.

Revegetation sites should be revisited and maintained as required. This action is aimed at following -up on previous works of the 1999 plan and re-engaging the community.

Sites along waterways where revegetation and fencing may be required to improve waterway condition may be identified during willow mapping (W1). Council to provide support to private landholders for rehabilitation works along waterways.

***RM1 – Assess revegetation projects to determine maintenance requirements***

***RM2 – Identify revegetation opportunities along waterway in conjunction with private landholders. May include fencing to prevent stock access.***

***RM3 – KC to undertake maintenance on public land where required and support landholders on private land***

### 5.2.9 Land use planning

Under the proposed State-wide Planning Scheme land zoned as rural resource will be zoned as agricultural land and the Biodiversity Protection Layer will not apply.

***LUP1 – KC to continue to advocate for Biodiversity Protection overlay to apply to all land containing native vegetation communities under the proposed State-wide Planning Scheme.***

### 5.2.10 Support for plan implementation

The implementation of priority actions within the Catchment Plan requires an ongoing and consistent support from the Council to achieve desired outcomes.

The 2014 review recommended that:

> *'The revision process itself include sufficient budget for initial implementation of high priority actions'* and *'Council have a prior commitment to including a budget line item to resource implementation and communication of priority actions for the first 10 years of the updated CMP'*.

As part of the Plan update limited funds have been allocated for implementation of some high priority and tangible on-ground works. This initial project work aims to re-engage the community. Financial and technical contributions from agencies that have management responsibilities within the catchment and the private sector should also be sought on the basis of matching funds provided by the council.

***IP1 – Council to consider funding a project officer to oversee implementation of the plan.***

***IP2 – Council to commit to a budget line item to resource ongoing implementation and monitoring of the priority actions for a minimum period of 10 years.***

### 5.2.11 Community Actions

As over 70% of the land area within the Catchment is privately owned actions to improve and maintain the health of the Catchment will rely largely on community input.

Council and Government agencies have an important role to plan in providing support to individual landholders and community groups through planning and legislative controls, provision of up to date information on catchment conditions and current management methods and to facilitate access to funding programs.

The community should be encouraged to manage their land to improve the catchment health through the following actions:

- Managing weeds on their land; increasing knowledge of weed species their impacts and their control; identifying new weeds species;
- Maintaining wastewater and septic tanks to prevent impacts on water quality;
- Preventing stock access to waterways;
- Rehabilitating eroded areas; revegetation of cleared land adjacent to waterways;
- Managing runoff from driveways and roads to minimise sediment reaching waterways; and
- Managing pets to minimise impacts on native wildlife through predation and toxoplasmosis

***CI1 – Council to provide information to the community to assist with the management of their land to maintain and improve condition of the Catchment.***

### 5.2.12 Aboriginal Consultation

No consultation with Tasmanian aboriginal people was undertaken as part of the plan update due to limited resourcing. A TASI search revealed 2 known artefact sites however this low number is likely to be due to low search effort rather than an absence of important sites.

It is recommended that resource consultation be undertaken as an action of this plan to learn the importance of the area to Tasmanian Aboriginal people past and present, incorporate their connection to and aspirations for the management of the catchment.

***AC1 – undertake resourced consultation with Tasmanian aboriginal people to guide management actions for attachment.***

# 6 Implementation plan

| Management Theme | Action | Priority | Timeline | Responsibility | Outcome |
|---|---|---|---|---|---|
| **Weeds** | W1-re survey crack willows along waterways in catchment and assess bank stability and reveg requirements | High | Dec 2018 | KC/DPIPWE | Determine extent of willow infestation within the catchment to inform level of expenditure. |
| | W2 - control crack willow regrowth | High | March 2019 | KC/DPIPWE/ contractor | Remove crack willow from river system |
| | W3 -map grey willows within catchment as part of broader municipal wide mapping | High | Dec 2018 | KC | Enable control strategy to be developed |
| | W4- determine location of Spanish heath containment lines | Moderate | May 2019 | CPP and KC | Management zones within catchment can be determined |
| | W5 - control spanish heath within or adjacent to known threatened species populations in conjunction with landholders | Moderate | 2019-23 | Landholder/KC/ contractor | Protect threatened flora populations from Spanish heath impacts |
| | W6 - undertake targeted control of Canary Broom along roadsides in upper catchment | Moderate | 2019-23 | KC/landholders/ contractors | Canary broom does not spread through upper catchment |
| | W7 - Monitor and control African Feathergrass and Darwins Barberry population at Longley | High | 2018 - 27 | KC | AFG and DB eradicated |
| | W8 - map Elisha's tears in catchment during willow mapping | Moderate | Dec 2018 | KC | Determine level of threat posed by this weed along rivers |
| | W9 - control isolated Elisha's tears plants (in conjunction with landholders) | Moderate | 2019-23 | Landholder/KC/ Contractor | Reduce occurrence of weed along rivers |
| | W10 - control outliers of montbretia in upper catchment (in conjunction with landholders) | Moderate | 2019-23 | Landholder/KC/ Contractor | Minimise spread of weed into upper catchment |
| | W11 - foxglove control in upper catchment (in conjunction with landholders). | Moderate | 2019-23 | Landholder/KC/ Contractor | Minimise spread of weed into upper catchment |

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| | W12- undertake targeted weed education program. | Moderate | 2019-23 | KC | Level of awareness of weeds specie increases. Increased level of reporting of weeds to Council |
| **Biodiversity and Habitat Loss** | B1 – map additional threatened vegetation communities. | Moderate | 2019-23 | KC | Improve mapping of TVC in catchment |
| **Recreational Opportunities** | RO1 – Undertake feasibility study for track link along North West Bay River trail from Longley to Margate. | Moderate | 2019/20 | KC | Requirements for a new trail are determined |
| **Recreational impacts** | RI1 – Future recreational planning within the Catchment to consider river access points and facilities and impacts of increase visitor usage. | Moderate | 2019 | KC/DPIPWE | Requirements for access improvement determined. Costs can be determined for budget submission |
| **Water quality monitoring program** | WQM1 -Advocate for water quality station in upper catchment. | Moderate | ongoing | Partnership b/w Govt management agencies | Water quality station is installed to monitor nutrients and contaminants and inform future actions |
| | WQM2 - Government management agencies to investigate formal geomorphological assessment of river banks. | Moderate | 2019-23 | | Cost of geomorphological assessment determined to allow budget submissions |
| | WQM3 - Undertake survey as funds allow. | Moderate | 2019-23 | Consultant | Geomorphological assessment carried out align NWBR to inform future actions |
| | WQM4 – Investigate community WaterbugBlitz program for Catchment. | Moderate | 2019 | KC/DPIPWE/ NRM Agency | Regular water quality measurement undertaken. Community engagement |
| **Water quantity and management** | WM1- Seek Water Management Statement for North West Bay River | Moderate | 2018/19 | KC/DPIPWE | Provide management tool to inform long term planning. |
| **Fire** | F1 – KC to provide input into regional or landscape fuel reduction plans | Moderate | 2019-23 | KC/TasFire | Requirement and issues within the catchment considered by TasFire in burn planning |
| **Revegetation maintenance** | RM1 -assess revegetation projects to determine maintenance requirements | Moderate | 2019-2020 | KC | Condition of revegetation areas and required maintenance determined. |

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| | RM2 – Identify revegetation opportunities along waterway in conjunction with private landholders. May include fencing to prevent stock access. | High | 2018 | KC/DPIPWE | Priority revegetation sites identified |
| | RM3 – Undertake maintenance of revegetation projects on public land and support landholders on private land | Moderate | 2020-2027 | KC/landholders | Public areas maintained and adjoining private land shows increase in maintenance of river impacts.<br>Community re-engaged. |
| **Land Use Planning** | LUP1 - advocate for Biodiversity Protection overlay to apply to all land containing native vegetation communities under the proposed State-wide Planning Scheme | Low | 2018/19 | KC | Planning protection for native vegetation is maintained under new State-wide Scheme |
| **Support for Implementation** | IP1 – Council to consider funding a project officer to oversee implementation of the plan | High | 2018/19 | KC | Priority actions for Catchment Plan are progressed |
| | IP2 – Council to commit to a budget line item to resource ongoing implementation and monitoring of the priority actions for a minimum period of 10 years. | High | 2018/19 | KC | Commitment to ongoing and sustained implementation of the Catchment plan is secured. |
| **Community Actions** | CI1 – Provide information to the community to assist with the management of their land to maintain and improve condition of the Catchment. | High | 2018-2027 | KC/DPIPWE/ NRM group | Awareness of landowners and management of private land increased |
| **Aboriginal Consultation** | AC1 – undertake resourced consultation with Tasmanian aboriginal people to guide management actions for attachment | High | 2018-2019 | KC to facilitate | Management actions incorporates aboriginal knowledge and aspirations |

*KC = Kingborough Council; DPIPWE = Department of Primary Industries, Parks, Water and Environment.*

# 7 Monitoring and Evaluation

An important component of this Catchment Management Plan is the monitoring and evaluation of all planned actions over time. This enables the effectiveness of actions to be assessed and adapted to successfully achieve goals.

A lack of monitoring of the actions from the 1999 Plan has made it difficult to evaluate the success and effectiveness of that plan despite many on-ground actions being undertaken.

The monitoring and evaluation strategy for the updated Catchment plan will be carried out using a simple spreadsheet format. This will enable the Council and community to track the progress of each action and report annually on the progress.

The spreadsheet will be cumulative to ensure all monitoring and evaluation information is contained in the same place.

The success of actions is to be ranked as per the following;

Success of Action ranking achievements -0 – 4

*0 = no achievement*

*1 = Low achievement – Objective partially met*

*2 = Moderate achievement – objective achieved, outcome partially met*

*3 = High achievement -objective and desire outcomes achieved*

## Monitoring and evaluation sheet – North West River Bay Catchment Management Plan

Date of Evaluation: By Whom:

| Action (abbreviated) | Objective of Action | Resources required | Actual resource allocated | Responsibility for evaluation | Date to be completed | % of action completed | Success of action* | Impediments to achieve success | Revised date to complete | Additional resources required |
|---|---|---|---|---|---|---|---|---|---|---|
| IP1-Project officer role funded | Priority actions progressed | | | | | | | | | |
| IP2- Implementation of Plan resourced by KC | Secure commitment for ongoing funding | | | | | | | | | |
| W1–re survey crack willows | Determine extent of willow infestation | Survey time Mapping | | | | | | | | |
| W2 – control crack willow regrowth | Remove Crack willow from river system | Contractor to undertake works | | | | | | More willow than can be controlled within budget | | |
| W3 –map grey willows within catchment | Develop control strategy | Survey time | | | | | | No funding for surveys | | |
| W4- determine location of Spanish heath containment lines | Management zones within catchment can be determined | Survey time Mapping | nil | | | | | No funding for surveys | | |
| W5 – targeted control of spanish heath | Protect threatened | KC/ Contractor | nil | | | | | | | |

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| | flora popns. | | | | | | | | | |
| W6 – undertake targeted control of Canary Broom | Minimise spread through upper catchment | KC/ Contractor | nil | | | | | | | |
| **W7 - Monitor and control African Feathergrass and Darwins Barberry** | Eradicate these species | On-going maintenance and follow-up control | | | | | | | | |
| W8 – map Elisha's tears | Determine level of threat | Survey time Mapping | nil | | | | | | | |
| W9 - control isolated Elisha's tears plants | Reduce occurrence along rivers | | | | | | | | | |
| W10 – control upper outliers of montbretia | Minimise spread in upper catchment | | | | | | | | | |
| W11 – control foxglove in upper catchment | Minimise spread in upper catchment | | | | | | | | | |
| W12– undertake targeted weed education program. | Increase awareness and reporting of weeds. | | | | | | | | | |
| B1 – map additional threatened | Improved mapping of TVC in catchment | | | | | | | | | |

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| vegetation communities. | | | | | | | | | | |
| RO1 –feasibility study for trail from Longley to Margate along NWBR. | Requirements for a new trail determined | | | | | | | | | |
| RI1 –assess current river access points and facilities. Provide management recommendations | Requirements for access improvement and costs determined. | | | | | | | | | |
| WQM1 – advocate for WQ monitoring | Water quality station installed. | | | | | | | | | |
| WQM2 – investigate geomorphological assessment of river banks. | Determine costs for budget submissions | | | | | | | | | |
| WQM3 – Undertake survey | Assess risks to inform future actions | | | | | | | | | |
| WQM4 – WaterbugBlitz program for Catchment. | Regular water quality measurement undertaken. | | | | | | | | | |
| WM1– Water Management | Provide management tool. | | | | | | | | | |

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| Statement for NWB River | | | | | | | | | | |
| F1 –KN input into planned burns | Catchment values/impact considered in burn planning | | | | | | | | | |
| RM1 –assess past revegetation projects | Re-engage community | | | | | | | | | |
| **RM2 – Identify reveg. locations** | Prioritise rehabilitation of degraded areas | | | | | | | | | |
| RM3 –maintain reveg projects | Follow-up previous work | | | | | | | | | |
| LUP1 - advocate for BPA over all native vegetation in State-wide Planning Scheme | Maintain planning protection under new State-wide Scheme | | | | | | | | | |
| IP1 – Fund Project officer for NWBCMP implementation | Implementation of plan supported by project officer | | | | | | | | | |
| IP2 – Obtain budget for Plan Implementation | Actions of plan are carried out. | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| **CI1 – provide management info to landholders** | Improved management of natural values on private land | | | | | | | | | |
| **AC1 – consultation with Tasmanian aboriginal people** | Inform management actions and priorities | | | | | | | | | |

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WIMS (2007). Water Information Management System Database. Department of Primary Industries and Water, Hobart, Tasmania.

# Appendix 1 – Stakeholders and Project Working Group

| Name | Interest and Experience |
|---|---|
| Derek Zwart – Essential Oils Tasmania – | Business on NWBR, irrigator, tourism operator |
| Matt Barrenger – Tassal | Community Engagement Officer |
| John Fawcett – TasWater | System performance and Major projects |
| DPIPWE –Water Branch<br>Scott Hardie<br>Andrew Dix<br>Henry Mutwell | <br>SH – testing flows<br>AD – Water Management Branch<br>HM – Water allocation |
| Axel von Krusenstierna – Wellington Park Trust | Executive Officer WPT |
| Mark Pharaoh – Parks and Wildlife Service | Regional Operations Manager – South (Acting) |
| James Gourlay – Crown Land Services | |
| Tim Wark – Westwood Properties Pty Ltd | Landholder, Business (EOT) |
| Sarah Cope –<br>Trail Riders Action Committee | Secretary – TRAC<br>Community resident |
| John Cox –<br>Broken Weir Landcare Group | Convenor of BWLG; Community Resident; Involved with original 1999 catchment plan |
| Marcus Higgs | Original member of 1999 catchment committee; Community resident |
| Emma Bryant | Community (applied for PWG) |
| Liz Quinn – Kingborough Council | Environmental Planner |
| Darren Coulson – Kingborough Council | Stormwater Engineer |
| Rene Raichert – Kingborough Council | NRM Officer |
| Scott Corbett – Kingborough Council Weed Officer | Weed management within Council reserves and broader catchment. |
| Matthew Arkins | TRAC |
| Peter Lindsay | Resident on river at Brookfield end.<br>Previous Councillor |
| Bill and Margaret Chesterman | Residents – Inverawe Gardens at river mouth<br>On Original Catchment Committee |

**Project Working Group Members**: Dr Jennie Whinam, Robert Hazel, Ed Parker, John Cox, Derek Zwart; Kingborough Council Representatives Dr Anita Wild and Liz Quinn; Enviro-dynamics; Andy Welling and Dr Josie Kelman.