

media apps. This information could be used for understanding improvements that can be undertaken as future works.

The existing boardwalk along the railway embankment across the Basin is in the process of being widened by NZTA as a key link in the Glen Innes to Tamaki Drive shared pathway.

The renewal of the southern path around the Ōrākei Basin West and East reserves is currently underway.



Figure 17: Upgrade works on the railway embankment boardwalk across Ōrākei Basin

<p>Policy 16: Maintain paths and access structures to a high standard</p>
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Comment on Policy 16:

Council’s Full Facility maintenance contractor Ventia has maintenance responsibilities for the paths and access structures (stair cases, landings, boardwalks, pontoons) within the open space areas associated with the management plan.

The maintenance specifications for these assets are included below:

Tracks / Footpaths

Output statement: Walking surfaces provide a safe and uniform surface which is appropriate for their intended use and setting.

- (a) Tracks-footpaths are safe, uniform, weed free, clean, clear of vegetation encroachment, and functional.
- (b) Tracks-footpaths and any directional markers are maintained to support the visitor experience.
- (c) Drainage systems are maintained and cleaned to conserve the loss of surface materials, and to prevent flooding or damage to the asset.

Structures

Output statement: Structures are safe, functional, clean, visually pleasing, and serve their intended purpose.

- (a) Structures covered by this contract include but are not limited to rock walls, boardwalks, steps/ladders, skate ramps, bridges, predator fence, gazebos, band rotunda, retaining walls, monuments, pontoons, viewing platforms, wharfs, jetties and seawalls.
- (b) Structures, including footprint and fixings, shall be maintained to a safe, clean, structurally sound, weed free, serviceable and functional standard. This shall include the concrete pads and any mowing strips if present.

Maintenance audits by the Principal (council) of Ventia's contract performance are undertaken as required and are referred to in the contract. These audits are intended to measure how well the contract specifications are being delivered on these assets. Regular maintenance audits by council are still being fully embedded into operational practice. On-site observation indicates that the desired levels of service associated with the maintenance of these assets is variable and still to be fully achieved, however track condition is considered as much an asset renewal issue as much as a contractor maintenance issue.



Figure 18: Pontoon structure accessed from the main car park



Figure 19: Examples of the lower aggregate track below Ōrākei Road

Asset condition inspections for determining overall asset condition and asset renewal requirements are undertaken by the Community Facilities AMIS team (Asset

Management Intelligence Support). Inspections can be a mix of visual and specialised inspections. The frequency of inspections is dependent on the type of asset and may vary from one to three years. The most recent inspection of Ōrākei Basin West and East reserves was undertaken in February 2018 and was a comprehensive visual inspection of all assets. A further asset condition survey for the smaller reserve and open space areas included in the management plan has been scheduled for later in 2018.

A summary of the inspection data for Ōrākei Basin reserves is provided below in Tables 6 and 7 (1 – Very Good; 2 – Good; 3 – Moderate; 4 – Poor; 5 – Very Poor).

The inspection results indicate the walkways around the Basin are subject to high wear and require more maintenance and renewal than they may be receiving, with the hard structures such as fixtures and furniture, signage, and staircases appearing to maintain a good to moderate condition with less preventative maintenance.

Asset item	Measuring point location	Description	Condition grade	Specific comments on inspection	Inspection date
Post & Rail	19152	Asset Condition Grade	1		21/02/2018
Jetty	11175	Asset Condition Grade	1		21/02/2018
Routed Wood	10825	Asset Condition Grade	1		21/02/2018
Blade - Small Sign	33489	Asset Condition Grade	1		21/02/2018
Dog Sign	17237	Asset Condition Grade	2		21/02/2018
Retaining Wall	13051	Asset Condition Grade	2		21/02/2018
Plinth - Small	14691	Asset Condition Grade	2		21/02/2018
Signage	27245	Asset Condition Grade	2		21/02/2018
MARITIME BYLAW Sign	15786	Asset Condition Grade	2		21/02/2018
Plaque	15787	Asset Condition Grade	2		21/02/2018
Wooden Vertical Timber	19144	Asset Condition Grade	2		21/02/2018
Staircase	19326	Asset Condition Grade	2		21/02/2018
Handrail	11172	Asset Condition Grade	2		21/02/2018
Handrail	11173	Asset Condition Grade	2		21/02/2018
Boat Ramp	17720	Asset Condition Grade	2		21/02/2018
Fence	19140	Asset Condition Grade	2		21/02/2018
St Louis Low Lid Bin	8530	Asset Condition Grade	2		21/02/2018
Peblex Painted	8541	Asset Condition Grade	2		21/02/2018
Doggy Doo Bin	8497	Asset Condition Grade	2		21/02/2018
Doggy Doo Bin	15783	Asset Condition Grade	2		21/02/2018
Handrail	33498	Asset Condition Grade	2		21/02/2018
Staircase	13120	Asset Condition Grade	2		21/02/2018
Staircase	13121	Asset Condition Grade	2		21/02/2018
Handrail	21115	Asset Condition Grade	2		21/02/2018
Doggy Doo Bag Dispense	8624	Asset Condition Grade	2		21/02/2018
Boat Ramp	15184	Asset Condition Grade	2		21/02/2018
Footpath	22405285	Asset Condition Grade	2		21/02/2018
Signage	14695	Asset Condition Grade	2		21/02/2018
Solid Timber Slab	10004	Asset Condition Grade	3		21/02/2018
Solid Timber Slab	10005	Asset Condition Grade	3		21/02/2018
Solid Timber Slab	27247	Asset Condition Grade	3		21/02/2018
Bollard	19142	Asset Condition Grade	3		21/02/2018
Fence	19156	Asset Condition Grade	3		21/02/2018
Stone Wall	19158	Asset Condition Grade	3		21/02/2018
Timber Pole	31715	Asset Condition Grade	3		21/02/2018
Lighting	31717	Asset Condition Grade	3		21/02/2018
Lighting	31719	Asset Condition Grade	3		21/02/2018
Low Quality Seat	9824	Asset Condition Grade	3		21/02/2018
Peblex Painted	8547	Asset Condition Grade	3		21/02/2018
Peblex Painted	15782	Asset Condition Grade	3		21/02/2018
Handrail	21117	Asset Condition Grade	3		21/02/2018
Footpath	22401273	Asset Condition Grade	3		21/02/2018
Footpath	22401293	Asset Condition Grade	3		21/02/2018
Footpath	22405268	Asset Condition Grade	3		21/02/2018
Bollard - Large	14694	Asset Condition Grade	3		21/02/2018
Bollard	19164	Asset Condition Grade	4	Impact damage	21/02/2018
Routed Wood	10848	Asset Condition Grade	4	Rotting/splitting of timber	21/02/2018
Signage	10844	Asset Condition Grade	4	Loss of protective coatings	21/02/2018
Pole Sign	33477	Asset Condition Grade	4	Loss of protective coatings	21/02/2018
Footpath	22401178	Asset Condition Grade	4	Loss of metal and contamination with mud	21/02/2018
Footpath	22401194	Asset Condition Grade	4	Loss of metal and contamination with mud	21/02/2018
Footpath	22401217	Asset Condition Grade	4	Loss of metal and contamination with mud	21/02/2018
Footpath	22401255	Asset Condition Grade	4	Loss of metal and contamination with mud	21/02/2018
Footpath	22401311	Asset Condition Grade	4	Loss of metal and contamination with mud	21/02/2018
Footpath	22401329	Asset Condition Grade	4	Loss of metal and contamination with mud	21/02/2018
Footpath	22405031	Asset Condition Grade	4	Loss of metal and contamination with mud	21/02/2018
Footpath	22405046	Asset Condition Grade	4	Loss of metal and contamination with mud	21/02/2018
Footpath	22405064	Asset Condition Grade	4	Loss of metal and contamination with mud	21/02/2018
Footpath	22405082	Asset Condition Grade	4	Loss of metal and contamination with mud	21/02/2018
Footpath	22405103	Asset Condition Grade	4	Loss of metal and contamination with mud	21/02/2018
Dog Sign	17238	Asset Condition Grade	4	Loss of protective coatings	21/02/2018
Bollard - Large	14693	Asset Condition Grade	5		21/02/2018
Bollard & Chain	19160	Asset Condition Grade	5		21/02/2018
Footpath	22401237	Asset Condition Grade	5		21/02/2018

Table 7: Asset condition data for assets within Ōrākei Basin West and East reserves 2018

Site Description	Description	Description	Condition	Condition last updated date
Bonnie Brae Reserve	Signs	Blade - Small	3	17/05/2018
Bonnie Brae Reserve	Fences, Gates, Barriers & Bollards	Cyclone Mesh And Height <1.6	3	07/09/2015
Bonnie Brae Reserve	Fences, Gates, Barriers & Bollards	Pool - Steel	2	17/05/2018
Bonnie Brae Reserve	Seats	Solid Timber Slab	3	17/05/2018
Bonnie Brae Reserve	Seats	Solid Timber Slab	3	17/05/2018
Bonnie Brae Reserve	Paths	Staircase	1	07/09/2016
Bonnie Brae Reserve	Fences, Gates, Barriers & Bollards	Post & Rail	3	27/04/2012
Bonnie Brae Reserve	Fences, Gates, Barriers & Bollards	Fence	3	17/05/2018
Bonnie Brae Reserve	Rubbish Bins	Parks Perforated Steel	3	17/05/2018
Bonnie Brae Reserve	Rubbish Bins	Parks Perforated Steel	3	17/05/2018
Bonnie Brae Reserve	Playground	Module	2	25/05/2016
Bonnie Brae Reserve	Playground	Swing	3	25/05/2016
Bonnie Brae Reserve	Playground	Playground Surface	3	17/05/2018
Bonnie Brae Reserve	Playground	Playground Edge	3	25/05/2016
Bonnie Brae Reserve	Paths	Footpath	1	07/09/2016
Bonnie Brae Reserve	Paths	Footpath	1	07/09/2016
Bonnie Brae Reserve	Paths	Footpath	3	17/05/2018
Bonnie Brae Reserve	Paths	Footpath	3	17/05/2018
Bonnie Brae Reserve	Paths	Footpath	3	17/05/2018
Kelvin Reserve	Signs	Dog Sign	2	16/05/2018
Kelvin Reserve	Fences, Gates, Barriers & Bollards	Bollard & Chain	2	16/05/2018
Kelvin Reserve	Fences, Gates, Barriers & Bollards	Bollard & Chain	2	16/05/2018
Kelvin Reserve	Signs	Painted Wood	2	16/05/2018
Kelvin Reserve	Seats	Solid Timber Slab	3	16/05/2018
Macpherson Reserve	Paths	Staircase	3	15/05/2018
Macpherson Reserve	Fences, Gates, Barriers & Bollards	Bollard	2	15/05/2018
Macpherson Reserve	Fences, Gates, Barriers & Bollards	Post & Rail	3	17/05/2018
Macpherson Reserve	Signs	Pole Sign	3	15/05/2018
Macpherson Reserve	Signs	Bollard - Large	3	15/05/2018
Macpherson Reserve	Signs	Bollard - Large	3	15/05/2018
Macpherson Reserve	Signs	Bollard - Large	3	15/05/2018
Macpherson Reserve	Coastal Structure	Structure	2	01/09/2014
Macpherson Reserve	Paths	Staircase	3	15/05/2018
Macpherson Reserve	Paths	Staircase	3	15/05/2018
Macpherson Reserve	Paths	Handrail	3	16/05/2018
Macpherson Reserve	Fences, Gates, Barriers & Bollards	Fence	3	17/05/2018
Macpherson Reserve	Fences, Gates, Barriers & Bollards	Fence	3	15/05/2018
Macpherson Reserve	Fences, Gates, Barriers & Bollards	Fence	5	15/05/2018
Macpherson Reserve	Paths	Steps Boxed Lucerne Rd	3	15/10/2014
Macpherson Reserve	Paths	Steps Boxed Lucerne Rd	3	16/05/2018
Macpherson Reserve	Paths	Steps Boxed Lucerne Rd	3	15/10/2014
Macpherson Reserve	Fences, Gates, Barriers & Bollards	Pool - steel	3	04/08/2014
Macpherson Reserve	Fences, Gates, Barriers & Bollards	Cyclone Mesh and Height >1.6	3	17/05/2018
Macpherson Reserve	Fences, Gates, Barriers & Bollards	Pool - steel	3	04/08/2014
Macpherson Reserve	Fences, Gates, Barriers & Bollards	Pool - steel	3	04/08/2014
Macpherson Reserve	Fences, Gates, Barriers & Bollards	Fence Other	4	17/05/2018
Macpherson Reserve	Signs	Bollard - Large	3	17/05/2018
Macpherson Reserve	Signs	Pole Sign	3	17/05/2018
Macpherson Reserve	Signs	Street Sign	3	17/05/2018
Macpherson Reserve	Paths	Handrail	3	15/10/2014
Macpherson Reserve	Paths	Handrail	3	15/10/2014
Macpherson Reserve	Poles, Lamps & Lights	Orakei Basin Sluice Gate Cabin	2	17/05/2018
Macpherson Reserve	Bridge - Mcpherson Res to Lucerne	Bridge Barrier	3	17/05/2018
Macpherson Reserve	Bridge - Mcpherson Res to Lucerne	Bridge Barrier	3	17/05/2018
Macpherson Reserve	Paths	Footpath	3	16/05/2018
Macpherson Reserve	Paths	Footpath	2	16/05/2018
Macpherson Reserve	Paths	Footpath	3	17/05/2018
Meadowbank Reserve	Bush Area	Bush Area	4	16/05/2018

Table 8: Asset condition data for Bonnie Brae Reserve, Kelvin Reserve, Macpherson Reserve, Meadowbank Reserve as at June 2018

Recommended management actions

- Embed maintenance audits into operational practice to regularly measure how well the contract specifications are being delivered on these assets.

Policy 17:

Improve access by providing connections where gaps are apparent within the walkway network around Ōrākei Basin reserves and key connections to other public areas

Comment on Policy 17:

Since the adoption of this policy the boardwalk adjacent to the railway embankment has been completed, along with the Lucerne Road walkway and bridge across Ōrākei Creek on the eastern side allowing for a continual loop walkway around the Basin. The diagram below indicates the current pedestrian access points to Ōrākei Basin and the adjoining open space areas (indicated by yellow dots), which includes pedestrian movement along the local street network in places. One potential location to be considered for future pedestrian access to the Basin walkway is through the parcel of Ōrākei Basin East Reserve located at 123-129 Upland Road (indicated by the green dot). Notwithstanding the issues of terrain, ecology, and access route design, a connection here would provide a convenient access to the southern side of the walkway loop from this section of Upland Road.

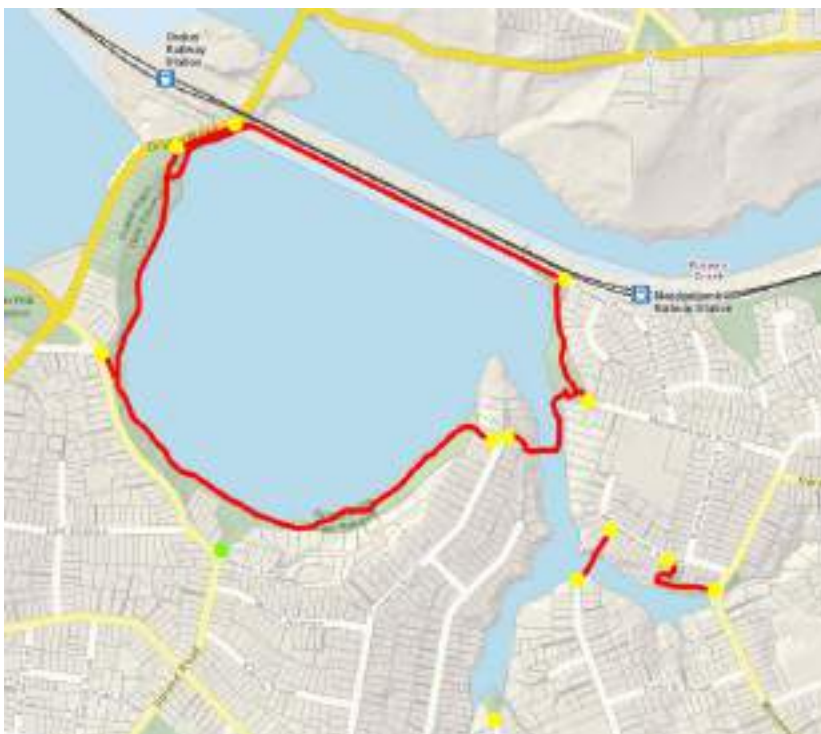


Figure 20: Access points to the Ōrākei Basin walkway network

Ngāti Whātua Ōrākei are currently planning for a network of walkways in the Pourewa Reserve, which adjoins both the Basin and Kepa Bush. The Iwi are in liaison with Auckland Council regarding connectivity as this project should have integration with the area.

Recommended management actions

- Investigate the feasibility of a new connection to the Ōrākei Basin walkway loop through reserve located at 123-129 Upland Road.

Policy 18:

Paths should be designed by universal access principles, where practicable

Comment on Policy 18:

The Auckland Design Manual provides guidance on universal design principles and how they can be integrated into open space environments. The guidelines state that universal design is a holistic design philosophy that aims to create environments that can be used by as many people as possible by making them more accessible, safer, and convenient for everyone regardless of age and ability.

In the design of accessible routes through open space environments, universal design seeks that approachability, accessibility and usability are fundamental requirements of an accessible journey. A path network fails to meet these criteria when stairs are provided as the only option, there is a lack of signage, and surfaces are slippery or uneven.

The renewal of the path around the Ōrākei Basin West and East reserves is currently underway. This will provide a wider and more consistent walking surface through this southern section of the Basin walkway.



Figure 21: Temporary path remedial work in Ōrākei Basin East, awaiting the upgrade project

The existing terrain of the Ōrākei Basin open space network makes providing an all access path network in all places unachievable. The existing steps at the Auckland Water Ski Club up to Lucerne Road, steps from Lucerne Road down to the footbridge across Ōrākei Creek, and steps from Ōrākei Road down to the bush track, all prohibit the entire walkway being fully accessible for all users.



Figure 22: Examples of the difficulty in achieving universal access in all locations of the path network

However directional signage is available at several entrance points to the walkway around the Basin. This provides a basic level of way finding for walkway users.



Figure 23: Way finding signage

A delineated pedestrian area through the main car park is marked on the pavement to provide a legible access route through this section of the walkway. Signage indicates the access road is a shared zone for pedestrians, cycles and vehicles.



Figure 24: Pedestrian movement through shared spaces



Figure 25: Steps below Ōrākei Road

Recommended management actions

- Further upgrade work could be undertaken on sections of bush track below Ōrākei Road and through Macpherson Street Reserve to provide a higher standard of aggregate walking track, which will provide a more consistent surface suitable for all abilities.

Objective 7: Recreation and use

To provide for a variety of recreational pursuits to the extent that these are compatible with the landscape, cultural and natural values of the water body and reserves.

Policy 19:

Prepare and implement a sediment monitoring programme, which should measure the rate of sedimentation on an ongoing basis and be commenced as a matter of priority

Comment on Policy 19:

No sediment monitoring programme has been implemented to date since the adoption of the management plan. This policy remains to be given effect to.

Measuring the sedimentation rate in the Ōrākei Basin can be accomplished using multiple methods, but the most appropriate method will depend on whether information is sought on historical or current sedimentation rates. For example, if an understanding is needed on the historical sedimentation rates in the Basin, sediment cores could be collected at various locations. These samples would be analysed for their radioisotope concentrations, which would demonstrate when the sediment was last exposed to the atmosphere. This method will not give current sedimentation rates because the upper section of the sediment is often disturbed by water motion or animals.

Methods to monitor long-term sediment accumulation in the Basin can be done using LiDAR, an aerial imaging tool that can be used for the intertidal areas of the Basin, or with boat-based sonar to map the bathymetry of the Basin. These methods will not pick up small-scale changes in sedimentation (i.e. less than 10 cm) but could provide a long-term record of sedimentation. Surveys would need to be done every one to two years.

Short-term sediment monitoring can be done using tools that are placed into the sediment and monitored monthly to quarterly. Methods include sedimentation plates, surface elevation tables, and sediment bed level sensors. For all of these methods, however, markers will need to be deployed on the surface of the water so that the instruments can be relocated each time. This may be an issue in areas where water sports take place.

Recommended management actions

- Implement an ongoing sediment monitoring programme for Ōrākei Basin to establish the rate of sedimentation within the Basin against a baseline water depth.

Policy 20:

Undertake dredging within the Basin should it be identified through the sediment monitoring programme that ongoing sedimentation is significantly adversely affecting water based recreation activities currently undertaken, such as water skiing and small boat sailing.

Comment on Policy 20:

The management plan discusses previous dredging activities within the Basin undertaken in 2001. As no sediment monitoring programme has been implemented to date since the adoption of the management plan, there exists no objective assessment

of the rate of sediment accumulation within the Basin on which to base any decisions regarding any further dredging.

Anecdotal evidence from the Auckland Water Ski Club indicates that the current build up in sedimentation is decreasing the depth of water within the Basin. This has been observed by the club as being more pronounced further away from the sluice gates; such as along the East Reserve to West Reserve, around the boat ramp, Scout hall and the southern end of the railway line embankment. For the club this is particularly noticeable on the ski course that runs approximately parallel to Upland Road (Ōrākei Basin East and West Reserve). Concern exists within the club that a response to sediment build up is required otherwise the Ōrākei Basin will become unusable for water based recreation activities.

Recommended management actions

- The Ōrākei Basin Management Plan recommends a baseline water depth is established and a supporting dredging programme be established.
- Implement an ongoing sediment monitoring programme for Ōrākei Basin to establish the rate of sedimentation within the Basin against a baseline water depth.

Policy 21:

Council will contract out the operation of the sluice gates so that they are operated in accordance with a set of performance standards including the conditions of the resource consent for impoundment of the Basin.

Comment on Policy 21:

The sluice gates were upgraded in 2010 due to the previous gates leaking, resulting in a gradual lowering over time of the water level impounded in the Basin. The operation of the gates for flushing of the Basin has continued to remain with the Auckland Water Ski Club to manage. Operation of the gates is undertaken by club members manually opening and closing the gates by a control box over the sluice gates. The performance standards for the operation of the gates are:

- flushing of the Basin on a fortnightly basis
- emergency flushing after heavy rainfall that exceeds 5mm in one hour, or 15mm in three hours

A project is included in the Ōrākei Local Board's forward renewal programme for the gates to be automated and operation of the system to revert back to Auckland Council. The automation project will enable the water levels of the Basin to be monitored via alarms and cameras, with the functionality of controlling the gates remotely.



Figure 26: Sluice gates programmed for upgrade to an automated operation

Policy 22:

Retain a mix of active and passive recreational functions within the reserves, including open spaces, paths, vegetation, car parking and water access areas.

Comment on Policy 22:

The reserve areas contained within the management plan provide opportunities for a mix of passive and active recreational opportunities. The policy seeks to ensure the mix of recreational opportunities is retained, without one activity dominating another.

Further engagement with a range of users is required, but there does not appear to be a conflict between the multiple recreational pursuits. Access to the water body is managed by exclusive use times set for the different water users. Exclusive areas are nominated in the current bylaw for motorised and non-motorised water vessels. The Basin itself is a key recreational asset for water skiing, sailing, model boating, and other organised water body sports. The Auckland Water Ski Club, Akarana Young Mariners, and Ōrākei Sea Scouts all have club room facilities located on the edge of the Basin, with Youthtown utilising the club facilities of the Ōrākei Sea Scouts. Under the Ōrākei Basin Bylaw 2006 (now superseded by the Navigation Safety Bylaw 2014 and

Controls) swimming and fishing are not provided for in Ōrākei Basin. For this reason the water quality within the Basin is not tested under the regional SafeSwim water quality monitoring programme. However, given the range of active recreational pursuits that have contact with the Basin waters, a programme of ongoing water quality testing is recommended.

Provision is provided for other pursuits around the Basin and associated reserve areas, including the use of the open grassed areas and path networks around the water body for walking / running, quiet contemplation and sitting, on and off leash dog exercising, picnicking, and playground use at Bonnie Brae Reserve.



Figure 27: Launching from the access ramp at the main car park

Recommended management actions

- Use sediment monitoring results obtained through the new monitoring programme to review the Basin flushing regime to ensure recreation values are maintained.

Policy 23:

Provide an appropriate quantity of park assets to support the recreational functions of the reserves and Basin, for example seats, bins, paths, fresh water supply and public toilets.

Numerous assets are provided throughout the reserves and the Basin to support the recreational use and enjoyment of these areas. Although generally not of a consistent style and standard, park assets are placed in appropriate locations for sitting and enjoying views, disposal of rubbish and dog litter, access routes and linkages around the reserves, and way finding signage for route selection.

Not currently provided for within the reserve network and worth consideration in future Local Board programmes would be:

- a public toilet located in the vicinity of the main car park at Ōrākei Basin West Reserve
- picnic tables close to the car park and open grassed areas
- drinking fountains at selected positions on the loop walkway
- interpretation and information signage, particularly in the area of Ōrākei Pa overlooking the Basin, along the loop walkway within regenerating bush areas, and close to one of the water sports clubroom buildings
- suitable car park and entrance lighting where this does not create Crime Prevention Through Environmental Design (CPTED) safety issues.





Figure 28: Examples of various park assets

A Visitor Profile and Satisfaction Survey completed by the market research company Captivate has been completed over the summer of 2017/18 for Ōrākei Basin.

While feedback from only 25 respondents was obtained, the results indicate the Basin and surrounding reserve network is popular with users for dog walking, active pursuits, organised sports, socialising, and use of the nearby playground. More assets that support these activities were requested including more parking, rubbish bins, lighting, and a public toilet.

Several asset improvement projects are included in the pipeline of project delivery for Ōrākei Basin in 2017/18 and 2018/19 and include the Lucerne Road step improvements; the main car park boat ramp upgrade; upgrade of the Ōrākei Basin East Reserve aggregate track including drainage improvements; and upgrade of the Ōrākei Basin West Reserve concrete path and drainage improvements. Planned but not yet confirmed projects for delivery in the 2019/20 financial year include further car park and path renewals.

Recommended management actions

- Undertake an infrastructure needs assessment for Ōrākei Basin to inform future programming of capital works projects for seats, bins, toilets, paths, signage, tables etc.
- Commission a user intercept survey every three years to gauge satisfaction with assets and facilities provided at Ōrākei Basin.

Policy 24:

Provide and maintain quality signs. Particular attention should be given to signs relating to water activities and the Ōrākei Basin Bylaw 2006. Signs should clearly identify dog off-leash exercise areas.

Comment on Policy 24:

A signage project was completed in 2013 to achieve a consistent style of signage in line with Auckland Council standards. The signage has been predominantly installed at entrances and high use locations around the Basin. Examples included below illustrate that the signage installed around the Basin is for the purpose of identification, way finding, safety, dog off-leash areas, and water bylaw regulations. Replacement, cleaning, and vegetation trimming around signs is required in places.





Figure 29: Examples of signage installed around Ōrākei Basin

Other temporary signage is installed in locations related to specific project work for physical works improvements and pest control. Removal of this signage is necessary after the scheduled event to avoid confusion with park users and to maintain a clutter free environment.



Figure 30: Temporary project works and pest control signage

Locations of signage installed around Ōrākei Basin and adjacent open space areas is indicated below.



Figure 31: Current mapped locations of signage within the Ōrākei Basin reserves

Draft interpretation signage was developed in 2012 for placement at the main car park and at the Purewa entrance to Macpherson Street Reserve. The signage provided a natural and cultural history of Ōrākei Basin. Due to the timing of related upgrade works in the vicinity, the signage was not installed. The need for interpretation signage around

the Basin in particular is high, and it is recommended this project be re-activated subject to a review of the draft signage and sufficient budget being available for installation.



Figure 32: Draft interpretation signage prepared for installation in 2012

The cultural history of Ōrākei Basin

A place of plenty

'Ōrākei' - 'the dwelling place of Rakei-iri-roa', a chief of the Tokomaru canoe.

Twentieth century developments disturbed the evidence of earlier settlement and use around Ōrākei Basin. Middens – the shell, stone, bone and charcoal remains of traditional food preparation – and signs of terracing and house sites suggest the importance of the area to early Māori. Volcanic soils provided a nutrient-rich base for gardening. The sheltered Waitematā harbour provided safe anchorage and kaimoana/seafood was plentiful.

The people of Ngāti Whātua came from here from the far north in the 1700s. After leaving in the 1820s to escape rival tribes, they returned under leader Aphihi Te Kawai in 1835 and put down permanent roots.

The north-western slopes of the Ōrākei Basin tuff ring commanded a clear view across Hobson Bay towards Waitematā Harbour, creating an excellent defensive site for Ōrākei pā. This pā was central to a network of kainga/settlements and further-flung summer camps, where tangata whenua grew crops, netted fish such as pātiki/flounder, kanae/mullet and kahawai, and gathered shellfish. The Ngāti Whātua o Ōrākei community netted fish and gathered shellfish around Pukapuka (Ōrākei Creek) and Te Pourewa (mouth of Purewa/Pourewa Creek) well into the 20th century until changes to the foreshore, sedimentation and pollution affected the gathering of kaimoana.

In 1840, Te Kawai and two other Ngāti Whātua chiefs signed the Treaty of Waitangi. At that time, the Crown was buying Māori land and reselling it for profit. Māori were to benefit from a percentage of the sale proceeds each time the land changed hands.

Believing in a mutually beneficial relationship, Ngāti Whātua transferred land across the Tāmaki-makau-rau/Auckland isthmus to the Crown. These land transfers resulted in the settlement of thousands of Europeans. But the social benefits and protection that iwi expected in return were not realised. The Crown did not keep many of its guarantees. As Ngāti Whātua o Ōrākei's stake in the expanding Auckland settlement declined, they lost access to traditional lands and resources which diminished their ability to exercise mana whenua and participate in the growing colony.

In 2011 the Crown acknowledged that it had breached the principles of the Treaty of Waitangi, with negative results which still affect Ngāti Whātua o Ōrākei today.

Straight lines on the landscape

The railway embankment running across Ōrākei Basin is part of the North Island Main Trunk Line. This dominant manmade feature separates the basin from Purewa Creek and Hobson Bay. Built in the 1920s, it impounded the crater's saltwater lake.

Auckland City Council maintains Ōrākei Basin as 'a public boating and associated water-related activities area'. Since sluice gates were installed under the embankment in the 1930s, the basin's water level has been controlled. At first, the gates were closed only during summer: in winter, fresh seawater flowed in and out with each tidal cycle. As water-based activities became more popular, the gates were closed during winter as well, to keep more water in the crater.

Flushing – opening the control gates at high tide so that fresh seawater flows into Ōrākei Basin – now takes place every two weeks. Flushing helps to prevent sediment build-up and algae growth, improving the quality of the impounded water.



Figure 33: Draft interpretation signage prepared for installation in 2012

Recommended management actions

- Complete the installation of the draft interpretation panels prepared in 2012 on the geological and cultural history of the Basin.

Policy 25:

Organise an annual clean up of inorganic debris within the water bodies and reserve areas. The clean up should be done prior to peak summer use.

Comment on Policy 25:

The Auckland Water Ski Club has confirmed that the club organises their own rubbish clean up events annually around the vicinity of their clubrooms.

Council has knowledge of one larger organised volunteer rubbish clean-up taking place at Ōrākei Basin in recent years. The event took place in June 2015 and was facilitated by the Auckland Water Ski Club in conjunction with other Basin water user groups. This was a one-off event that could be supported by the Ōrākei Local Board in the future with resources and publicity should volunteer groups seek to undertake a more organised programme of rubbish removal and reserve beautification.

Recommended management actions

- Support an annual volunteer event to undertake a regular clean up of rubbish in the Basin and Creek, when the Basin is emptied.

Objective 8: Water Access

To increase use and enjoyment of the Basin by improving access to the reserves and the water.

Policy 26:

Undertake improvements to existing water access areas, in particular the main car park and boat ramps at Ōrākei Basin West Reserve.

Comment on Policy 26:

The main car park at Ōrākei Basin West Reserve was upgraded in 2015. The boat ramp is programmed for renewal in the short term. New posts for hitching boats have since been added to the wooden jetty. The Ōrākei Basin Access Road renewal project was also completed in 2015, which included extensive protection of the water edge along the road way with rock rip rap. The completed access way and car park works

failed to deliver on all the intended project outcomes and has impacted on users' access to the Basin, for instance boat launching at both the Scouts and public boat ramps has been restricted by the newly constructed rock rip rap. The completed work has been subject to a peer review exercise in 2018 by an independent consultant to determine what measures can be taken to improve the outcomes for Basin users and access to the Basin waters.

The scope of the independent review included:

- Review of the physical works undertaken on the coastal edge from the boat ramp south of the Scout buildings to the southern end of the car park
- Develop a range of potential remedial options to improve the coastal edge with sketch options and information to take to OBAG for consideration and feedback, before seeking endorsement from the Ōrākei Local Board.

Refine a preferred option to a developed design stage, at a level suitable to inform a consent application and approval process. This review is currently in draft form and is currently being presented to the Ōrākei Local Board for endorsement to determine the most suitable approach to improving water access for the public.





Figure 34: Examples of existing water access points

Recommended management actions

- Implement the agreed remedial measures after finalising of the independent peer review project to improve water access for recreational users.

Policy 27:

Improve the function of the access road to the main car park and boat ramp area at Ōrākei West Reserve. In particular, consideration should be given to the provision of the two-way vehicle passing and soil erosion that spills onto the carriageway.

Comment on Policy 27:

Since the adoption of the management plan, Council commissioned extensive investigation and design work on options to improve the access road, main car parking, and boat ramp area. Issues with these areas related to land stability, soil erosion, water edge erosion, and poor functional aspects of the entrance and accessway. Physical works to address these matters were completed in 2015.

However, due to aspects of the project not delivering on key priorities and also expectations of stakeholders, as stated in commentary on Policy 26 a peer review of the design and finished construction of the coastal edge works was undertaken in 2018 and is currently in draft form awaiting final approval.

The review has focused on:

- a) The effectiveness and appropriateness of the recently constructed rock rip rap wall. The rock rip rap wall that had been installed to protect the car park (including the jetty and pontoon) edge from erosion inhibits water access and has covered what was a small, dry, high tide beach area. Water access in this area is important for all regular user groups at the Basin, including the Ōrākei Yacht Club, Akarana Young Mariners, Youthtown and the Ōrākei Sea Scouts. It is also a key access area for casual recreational users of the Basin.





Figure 35: The upgraded access road and entrance from Ōrākei Road

Recommended management actions

- Implement the agreed remedial measures after finalising of the independent peer review project to improve water access for recreational users.

Policy 28:

Consider new opportunities for water access. For example, appropriate scale landings and structures.

Comment on Policy 28:

Feedback was sought from the members of the Ōrākei Basin Advisory Group on new opportunities for water access.

The Auckland Water Ski Club supports maintenance of the existing water structures but does not support new structures in the Ōrākei Basin area. One issue they face in their use of the Basin for training and competition is the concrete extension that protrudes approximately five metres into the Basin from the southern corner of the Ōrākei Basin East Reserve. The structure is used by dog owners to throw balls and sticks into the water ski lanes unaware of the potential risks. The club supports the removal of this concrete extension.

A stormwater report completed by Morphem Environmental Ltd. in 2015 identified multiple sites of informal water access along the southern and eastern walkway in Ōrākei Basin West and East reserves. These informal access points were noted in

front of seating areas and could be the result of dogs accessing the water. Morphem Environmental Ltd. recommended that formalising these entries could be considered in the future for amenity purposes, but did not form part of their scope relating to erosion and stormwater issues.

Recommended management actions

- Investigate whether these informal water access points could be formalised for amenity and recreational purposes.

Objective 9: Encroachments
To reduce private encroachments onto public land.

Policy 29:
Undertake a process to catalogue and measure encroachments, by way of aerial photo and cadastral analysis, and survey.

Comment on Policy 29:

Council staff have not pursued these outcomes. Land Advisory Services is aware of this action in the management plan but has not undertaken any process to proactively investigate encroachments in the Ōrākei Basin. Due to current capacity and resources, and as agreed with Legal Services, the Land Advisory team reviews encroachments that come to them for investigation on an ad hoc basis. An assessment is made on the level of priority (depending on health and safety and political risk especially) and investigations are undertaken only where they reach a high priority level.



Figure 36: Representative images of encroachment in to the reserve along the walkway loop

Recommended management actions

- Investigate by way of aerial photo and cadastral analysis, and survey, to gauge how prevalent private encroachment in to Ōrākei Basin reserve areas is. Develop a strategy for managing the extent of encroachments identified.

Policy 30:

Enforce the Auckland Council's 'Private use of public space' policy to resolve encroachments by way of authorisation or reinstatement of public land.

Comment on Policy 30:

As with Policy 29, Council staff have not pursued these outcomes. Land Advisory Services is aware of this action in the management plan but has not undertaken any process to proactively investigate encroachments in the Ōrākei Basin. Due to current capacity and resources, and as agreed with Legal Services, the Land Advisory team reviews encroachments that come to them for investigation on an ad hoc basis. An assessment is made on the level of priority (depending on health and safety and political risk especially) and investigations are undertaken only where they reach a high priority level.

Policy 31:

Physical projects, including vegetation planting, removal and maintenance, will be undertaken in accordance with erosion management practices.

Comment on Policy 31:

The Ōrākei Basin is subject to steep slopes and areas where erosion and slips are more prone to occur. The Ecological Restoration contract has implemented a staged approach to pest plant removal, to avoid erosion of bare areas of ground where weed removal has been undertaken. Areas of privet tree, for example, will be progressively removed over a number of years, while native species are established.

The use of agrichemical spraying has been removed from the maintenance contract for weed control, to avoid creating areas of bare ground that are vulnerable to soil erosion.

Physical works projects implemented within the Basin employ silt control practices such as silt fences, mulching, stormwater controls and bunds to minimise the potential for erosion of the works sites. Resource consent conditions ensure that appropriate silt control methods are undertaken and complied with.

Policy 32:

Stormwater outlets will be designed to avoid or mitigate erosion effects.

Comment on Policy 32:

Sinclair Knight Merz completed a stability feasibility study for Council in 2011. The study considered erosion and stability issues affecting the Ōrākei Basin walkway, the access road and car park areas for the boat clubs and general public, and the Basin edges. The report noted that amongst other factors, areas of erosion and poor bank stability were in part being caused by poor stormwater drainage. Poor channelling of runoff and poor outlet erosion control from private and public stormwater outlets were identified as causal factors. The report made a series of recommendations, based on areas listed by priority. The access road from Ōrākei Road to the boat car park, and then along the internal road to the public car park, were identified as immediate areas of focus and remediation. One key recommendation from the report was for rock protection from the outlet of stormwater pipes (both public and private) to the water's edge, to protect against surface erosion and reduce the risk of slips and margin erosion. This could be implemented through an ongoing programme of upgrades. A survey of all stormwater outlets entering the Basin is needed to determine the extent of the protection work required. As can be seen in the photos, some improvements have been made already with soft flume pipes extending the point of discharge of stormwater to the water's edge, with other examples of exposed nova coil pipe requiring rock protection.

In 2013 Riley Consultants provided investigation and design services for retaining walls and road repair works required along the upper and lower access road. Part of this design solution involved the use of stormwater bubble up chambers with scruffy dome lids in places, and rock armouring along the toe of the car parks and water access areas. Physical works proceeded in the following financial years.

Due to concerns with the finished scale of the construction works, an independent review was commissioned by Auckland Council in 2017 for the works completed along the coastal edge from the Sea Scout's boat ramp south to the end of the public car park. The report is still in draft format, and does recommend changes to the stormwater bubble up chambers and scruffy domes by replacing them with manholes and rock armoured outlet pipes.

Works are planned in 2018 to upgrade the southern portion of the Basin walkway through the Ōrākei Basin West and East reserves. Part of the preliminary design work for this project involved Morphum Environmental Ltd. undertaking a stormwater review and recommendation report for Council in 2015 regarding this section of the loop walkway around Ōrākei Basin. The report in particular considered appropriate measures to control stormwater flow as part of the planned walkway renewal and upgrade around the southern and eastern shoreline from the car park to the Auckland Water Ski Club. Ponding along sections of the walkway, track surface erosion, and erosion of the Basin edge have been areas of concern.

The report noted that in places stormwater catch pits had been installed in positions along the walkway to dissipate local ponding, and in general were operating effectively. The walkway design around this section of the shoreline will include the following measures to manage stormwater flows (Morphum Environmental Ltd. 2015):

- planted swales be installed to collect and convey flows on the uphill side of the walkway under the path and to the Basin
- formal overland flow paths to convey large rainfall events from the planted swales to the Basin. Boardwalks are proposed where the overland flow crosses the path
- installing rip rap in locations at the Basin edge that appear to be eroding from tidal action
- rip rap dissipation should be installed downstream of outfalls discharging into the Basin to prevent further incision, which could lead to bank instability.





Figure 37: Examples of storm water discharge points and outlets within the Basin

Recommended management actions

- In accordance with the recommendations of the SKM 2011 report, undertake a survey to catalogue and map all stormwater discharge points and channels into the Basin, and prepare a programme of upgrades to the discharge point to reduce erosion, flooding, and damage to public assets e.g. rock armouring.
- Update the SKM 2011 report to identify and monitor areas of active erosion and potential erosion on a plan. These should be assessed and classified in accordance with a set risk rating, and mitigation / management measures identified.

Policy 33:

Areas subject to surface erosion will be identified and practical methods will be implemented to remediate and minimise these effects.

Comment on Policy 33:

Areas potentially vulnerable to surface erosion will be identified by visual inspection. Where practical, surface water on slopes will be controlled to slow or otherwise control the flow. Bare surfaces vulnerable to erosion will be assessed and treated in a practical manner compatible with the natural environment.

Recommended management actions

- Ensure a suitably qualified geologist is included as part of the project team for any works planned in the vicinity of natural exposures of volcanic material around the Basin.

Policy 34:

The Ōrākei Basin Advisory Group will play a key role in public education on practices on private land to minimise erosion and silt entry into waterways.

Comment on Policy 34:

A key purpose of the Ōrākei Basin Advisory Group as outlined in their Terms of Reference is to help with educating local land owners on measures to minimise erosion and silt entry into local waterways:

OBAG Terms of Reference April 2017

(3) To work with the local community and landowners adjacent to the Ōrākei Basin to advocate for land use practices which support the objectives of the Plan, which the Plan cannot address such as erosion control, planting, weed and vermin clearance on private property.

The group is to establish a 'Friends of Ōrākei Basin' group to help achieve this outcome. This group has been formed and is called the Ōrākei Basin Protection Group Inc.

Feedback from OBAG has confirmed that no formal actions have been undertaken by the group in regards to public education. This will be a feature of their planned activities in the future, with the assistance of the Ōrākei Basin Protection Group.

Recommended management actions

- OBAG to support the Ōrākei Local Board and co-ordinate a public education programme for local land owners on measures to be taken on private property to minimise erosion and silt entry into local waterways to improve water quality.

3.0 Recommendations for future actions and monitoring opportunities

The Ōrākei Basin Management Plan contains an informal action plan in Appendix 5, which was developed through several years of planning and project delivery activity at Ōrākei Basin.

A summary of these actions and the status of each is provided below.

Management Plan - Informal Action Plan - Appendix 5					
Priority	Recommended Action	Responsibility	Indicative cost	Funding options	Outcome
1	Continue with planned and funded projects (including Orakei Walkway S1 & 2; Orakei Gates Replacment; ERBNA etc) as these will continue to improve the value and profile of Orakei Basin as a regional asset. This will in turn assist in delivering the following actions.	Auckland City officers	Funded	-	Completed
1	Complete Orakei Basin Management Plan	Auckland City officers	Funded	-	Completed
1	Prepare an Orakei Basin Action Plan as part of the Orakei Basin Management Plan, which records and prioritises works, is reviewed annually, records what has been achieved, resets priorities for the coming year in response to available budgets and resources etc.	AC/LB/OBAG	\$5,000	-	Outstanding
1	Establish an Orakei Basin Advisory Group and a Friends of the Orakei Basin Group. The advisory group will be responsible for functions outlined in the Orakei Basin Management Plan and will operate in accordance with terms of reference developed by the Local Board and Council. The "friends of" group will be responsible for carrying out voluntary activities approved by the advisory group.	AC/LB/OBAG	Support costs only	LB/AC	Completed
1	Continue working with the current working group (Orakei Basin Protection Group/Society, MOU Parties, and Community Board Chairs) until the Advisory Group is established. Seek working group input into assessing key issues, costs to rectify, prioritising key works, so budgets can be sought. This should also involve assessing the success of completed projects.	Auckland City officers	-	-	Completed
1	Upgrade existing tracks around the Orakei Basin with priority being given to a) the track from the community buildings at Orakei Basin West Reserve to Orakei Road b) parts of concrete path at Orakei Basin East Reserve that have become uneven c) the Macpherson Street Reserve track d) the access path down from the bottom of Upland Road e) the steps to the Auckland Water Ski Club building from Lucerne Road.	Auckland City officers	To be determined	Renewals, annual plan	a) Completed b) Completed c) Completed d) In progress e) Completed
1	Develop a comprehensive weed and pest management and revegetation plan, which includes ongoing monitoring to assess the success of the plan. The plan needs to utilise existing information such as the 'Meadowbank Reserve Management Report' and 'Weed Control and Native Revegetation Plan for Orakei Basin (Hobson Ward)'. The pest control element should include baseline surveys of both pests and birds.	AC/LB/OBAG	\$10,000	AC Policy	Completed, and incorporated in to Wildlands Ecological Restiration contract outcomes
1	Areas of active erosion and potential erosion should be accurately identified and recorded on a plan. These should be assessed and classified in accordance with a set risk rating, and mitigation / management measures identified.	Auckland Council officers	To be determined	AC operational	Completed in SKM report 2011

Management Plan - Informal Action Plan - Appendix 5					
Priority	Recommended Action	Responsibility	Indicative cost	Funding options	Outcome
2	Prepare an annual State of the Orakei Basin report. The report will provide an annual environmental snapshot of the Basin and its surrounding open spaces for use as a tool in identifying actions needing to be undertaken and annual progress towards achieving these.	AC/LB/OBAG	\$10,000	AC Policy	In progress
2	Assess the state of the access road from Orakei Road to the Basin to determine requirement for either two lanes or formal passing bays, look to possibly retain edges to increase carriage way width and facilitate planting and reduce need for edge spraying.	Auckland Council officers	-	AC operational	Completed
2	Scope and assess options for erosion control along the main car park off Orakei Road and water's edge and safe public access through or around the car park.	Auckland City officers	To be determined	AC operational	Completed
2	Delete bank edge spraying along Upland Road from the maintenance contract, and add to the Auckland City Council 'No Spray' list. Assess long term management options and costs for bank control along Upland Road (i.e. re-grassing / planting with stabilisation and mowing strip etc).	Auckland City officers	-	-	In progress. Spraying removed from the maintenance contract. Long term management options to be confirmed.
2	Add the Ski Club steps drainage and planting to the Renewal Programme and set as a high priority to address bank erosion. Develop solutions for track repair; erosion control and remedial planting.	Auckland City officers	To be determined	Renewals, annual plan	Completed
2	Add Troy Churton track to the Renewal Programme and set as a high priority to address bank erosion. Develop solutions for track repair; erosion control and remedial planting.	Auckland City officers	To be determined	Renewals	Completed
2	Review policy of leaving logs on site, discuss situation in the privet removal areas with Te Ngahere, and obtain costs for appropriate level of removal.	Auckland City officers	To be determined	AC operational	Outstanding
2	Assess the condition of the Basin bank in terms of stability, condition, coverage, and viewing potential, assess and incorporate this information when considering tracks, erosion control, weed control, and revegetation.	Auckland Council officers	To be determined	AC operational	Partly completed in Morphum Environmental Ltd. report for Orakei Basin West and East reserves 2015
2	Monitor sediment levels in the Basin to provide baseline data to inform decisions on dredging, in terms of the management plan's objective of maintaining the Basin for recreational use. Ongoing monitoring will also assist in assessing the success of the vegetation plan and erosion protection measures.	Auckland Council officers	To be determined	AC operational	Outstanding
2	Review and update signage around the Basin, ensure "dog on leash" is clear. The signage strategy should also reflect differing levels of suitability for contact recreation.	Auckland Council officers	To be determined	Renewals	Completed
3	Discuss planting and long term weed control along the rail embankment with Council officers and OnTrack. Develop planting plan and costs.	Auckland City officers	To be determined	AC operational	Completed
3	Identify stormwater outlets and channels, record on plan (update Auckland City GIS with asset information), assess where these are causing erosion, flooding, damage to existing assets (i.e. paths), recommend mitigation / management measures.	Auckland Council officers	To be determined	AC operational	Outstanding
3	Identify reserve boundary encroachments by private property and vegetation clearance by private property owners, and develop strategy for addressing these.	Auckland Council officers	To be determined	AC operational	Outstanding
3	Regular clean up of rubbish in Basin and creek could be undertaken when Basin emptied. Volunteer event supported by Council.	OBAG/AC/LB	To be determined	AC operational	Outstanding
5	Education of residents to reduce erosion and impacts on water quality and encourage residents to establish riparian vegetation and protect shags.	OBAG/AC/LB	-	-	Outstanding
5	Investigate with OnTrack weed management and revegetation of both sides of the rail embankment.	Auckland Council officers	-	-	Completed
5	Assess access to Basin's waters from Ngapuhi Road and other locations.	Auckland Council officers	-	-	Completed. Two access points installed, Purewa Creek and Ngapuhi Road accessway
5	Use sediment monitoring results to review Basin flushing regime to ensure recreation values maintained.	Auckland Council officers	-	-	Outstanding

Table 9: Summary of the Informal Action Plan contained in Appendix 5 of the management plan

2018 Action Plan Update

As a result of this report, new action items have been identified that should form the focus for the Ōrākei Local Board and stakeholder groups going forward. The assessment of progress against the policies of the management plan in this report has identified that there are opportunities for further actions to give effect to the strategic direction and outcomes contained in the plan. These actions have been compiled from the outstanding tasks contained in Appendix 5 of the management plan; from recommendations as a result of assessing the policies above; and from feedback from member groups of OBAG.

It is anticipated that these action items will be considered by OBAG to inform the preparation of a recommended action plan to the Ōrākei Local Board.

Each action item is given a priority ranking to guide decision making on future priorities:

1. High (H) – really important for strategic decision making
2. Medium (M) – if there is resources or budget available
3. Low (L) – could be a future project or carried out by volunteers or a community group.

An indication of the anticipated time frame for implementation of each action item is also provided:

Continue current practice (C)

Short time frame (S)

Medium time frame (M)

Long time frame (L)

OBMP objective	Action item	Priority	Timeframe
1	The Natural Environment		
	<ul style="list-style-type: none">• Continue with plant pest control in the blocks of good-quality restored native forest along the western margin of the site, in Macpherson St. Reserve and in Lucerne St. Reserve (Zones 1 and 5).	H	C
	<ul style="list-style-type: none">• Expand plant pest control – with follow-up planting of native species – into areas of	H	M

	<p>mixed native-exotic forest and exotic forest as resources permit (Zones 3 and 4).</p>		
	<ul style="list-style-type: none"> Undertake plant pest control, and enrichment planting of native species urgently within a small area of recent plantings on the southern edge of the Basin (Zone 2). 	H	S
2	<p><u>Water Quality</u></p>		
	<ul style="list-style-type: none"> Undertake a public education programme for local land owners on measures to be taken on private property to minimise erosion and silt entry into local waterways to improve water quality. 	M	M
3	<p><u>Heritage</u></p>		
	<ul style="list-style-type: none"> Amend operational maintenance practices for archaeological feature R11/87 (Ōrākei Pa) by increasing mowing heights. 	H	C
	<ul style="list-style-type: none"> Install interpretation signage appropriate for archaeological site R11/87 – (Ōrākei Pa), and other suitable locations, in collaboration with Ngāti Whātua Ōrākei . 	M	S
	<ul style="list-style-type: none"> For archaeological site R11/87 (Ōrākei Pa) consider methods to deter the continued use of informal secondary tracks through the extant defensive ditches on the southern end of the pa e.g. directional signage. 	H	S
	<ul style="list-style-type: none"> For archaeological site R11/1765 (Kelvin Reserve) do nothing and maintain the status quo. 	-	C
	<ul style="list-style-type: none"> Complete monitoring forms for the five additional archaeological sites identified within Ōrākei Basin and surrounding 	H	S

	<p>reserves since adoption of the management plan.</p> <ul style="list-style-type: none"> ○ R11/2342 – Lucerne Road Access ○ R11/2667 – Macpherson Street Reserve ○ R11/2683 – Ōrākei Basin West Reserve ○ R11/2701 – Ōrākei Basin East Reserve ○ R11/2719 – Ōrākei Basin East Reserve 		
	<ul style="list-style-type: none"> • Incorporate the five additional archaeological sites identified since 2010 (listed above) into a future update of the management plan. 	H	L
	<ul style="list-style-type: none"> • Install the proposed interpretation signage panels already developed for installation at the main car park and the Purewa Road entrance to the loop walkway. 	M	S
	<ul style="list-style-type: none"> • Continue to work with Ngāti Whātua Ōrākei to identify opportunities where shared stewardship of future initiatives and activities within the Basin could be achieved. 	H	C
	<ul style="list-style-type: none"> • Undertake archaeological assessments during any developments so that any evidence is recorded. 	H	C
	<ul style="list-style-type: none"> • Prepare an interpretation plan. 	M	M
	<ul style="list-style-type: none"> • Manage sites to avoid any ongoing degradation. 	H	C
4	<u>Implementation</u>		
	<ul style="list-style-type: none"> • Prepare an Ōrākei Basin Action Plan based on the recommendations of OBAG, which is 	H	M

	adopted by the Ōrākei Local Board and records and prioritises works, is reviewed annually, records what has been achieved, and re-sets priorities for the coming year in response to available budgets and resources etc.		
	<ul style="list-style-type: none"> Programme a review of the management plan to ensure the plan continues to reflect the strategic priorities and core values of Ōrākei Basin. 	M	L
5	<u>Buildings and structures</u>		
	<ul style="list-style-type: none"> Undertake a building survey of the existing clubs and users to identify future building requirements within the Basin. 	L	L
6	<u>Walkways and access</u>		
	<ul style="list-style-type: none"> Investigate the feasibility of a pedestrian connection with the Ōrākei Basin East Reserve walkway through the reserve at the corner of Upland Road and Darwin Lane (123-129 Upland Road). 	L	M
	<ul style="list-style-type: none"> Embed maintenance audits into operational practice to regularly measure how well the contract specifications are being delivered on these assets. 	M	S
	<ul style="list-style-type: none"> Undertake further upgrade work on sections of bush track below Ōrākei Road and through Macpherson Street Reserve to provide a higher standard of aggregate walking track, which will provide a more consistent surface suitable for all abilities. 	L	M
7	<u>Recreation and use</u>		
	<ul style="list-style-type: none"> Establish a baseline water depth for the Ōrākei Basin to provide for recreational water pursuits. 	M	S

	<ul style="list-style-type: none"> Undertake a historical assessment of sedimentation in the Basin through the sampling of sediment cores. 	L	S
	<ul style="list-style-type: none"> Use sediment monitoring results to review the Basin flushing regime to ensure recreation values are maintained. 	M	L
	<ul style="list-style-type: none"> Undertake an infrastructure needs assessment for Ōrākei Basin to inform future programming of capital works projects for seats, bins, toilets, paths, signage, tables etc. 	L	S
	<ul style="list-style-type: none"> Support an annual volunteer event to undertake a regular clean up of rubbish in the Basin and Creek, when the Basin is emptied. 	M	S
8	<u>Water Access</u>		
	<ul style="list-style-type: none"> Implement the agreed remedial measures to improve water access for recreational users after finalising of the independent peer review project. 	M	M
	<ul style="list-style-type: none"> Investigate whether the identified informal water access points could be formalised for amenity and recreational purposes. 	L	M
9	<u>Encroachments</u>		
	<ul style="list-style-type: none"> Investigate by way of aerial photo and cadastral analysis, and survey, to gauge how prevalent private encroachment in to Ōrākei Basin reserve areas is. Develop a strategy for managing the extent of encroachments identified. 	L	L
	<ul style="list-style-type: none"> Enforce the Auckland Council's 'Private use of public space' policy to resolve 	M	L

	encroachments by way of authorisation or reinstatement of public land.		
10	Erosion		
	<ul style="list-style-type: none"> Prepare a programme of upgrades to stormwater discharge points to reduce erosion, flooding, and damage to public assets e.g. rock armouring. 	L	M
	<ul style="list-style-type: none"> Ensure a suitably qualified geologist is included as part of the project team for any works planned in the vicinity of natural exposures of volcanic material around the Basin. 	H	C
	<ul style="list-style-type: none"> OBAG to support the Ōrākei Local Board and co-ordinate a public education programme for local land owners on measures to be taken on private property to minimise erosion and silt entry into local waterways. 	M	M

Table 10: Updated Action Plan (2018)

4.0 Monitoring Opportunities

Moving forward it is recommended that the State of the Basin Report provides for the monitoring of the high priority activities identified in Table 11 below. Medium priorities are considered desirable if funds were available and low priorities are considered optional and something that could be carried out in the longer term.

OBMP objective	Monitoring options for FY2019	Priority
1	The Natural Environment	
	<ul style="list-style-type: none"> Terrestrial Ecology – continue to monitor prevalence of weeds and pests and quality of canopy cover. 	H
	<ul style="list-style-type: none"> Marine Ecology - implement a programme of quarterly visual surveys (one of which should be in Oct/Nov to allow for comparisons with other Auckland sites) and sediment cores at randomly selected sites to estimate species diversity and abundance within Orakei Basin. 	M
	<ul style="list-style-type: none"> Support the implementation of a community led project for regular bird monitoring within the Orakei Basin and surrounding park network. 	L
2	<u>Water Quality</u>	
	<ul style="list-style-type: none"> Continue monitoring for <i>Enterococci / E Coli</i> during the weeks that the Basin is in high recreational use. 	H
	<ul style="list-style-type: none"> Undertake water quality monitoring including a full standard suite of water quality tests and metals 	M
	<ul style="list-style-type: none"> Implement a programme of routine monitoring for algal blooms during the summer months, or more specifically during 	L

	the months of high recreational use. It is likely that this will be December through March. If necessary undertake water quality sampling to determine if algae present is harmful to human health.	
3	<u>Heritage</u>	
	<ul style="list-style-type: none"> Continued monitoring of heritage sites 	H
6	<u>Walkways and Access</u>	
	<ul style="list-style-type: none"> Install a track counter to measure levels of use. 	M
7	<u>Recreation and use</u>	
	<ul style="list-style-type: none"> Undertake long term monitoring of sedimentation rates to maintain adequate water depth for recreation outcomes. 	M
	<ul style="list-style-type: none"> Continue carrying out user intercept surveys to gauge satisfaction with assets and facilities provided at Orakei Basin. 	M
10	<u>Erosion</u>	
	<ul style="list-style-type: none"> Monitor areas of active erosion identified in the SKM 2011 report. 	M

Table 11: Monitoring options for FY2019

Terrestrial Ecology

The terrestrial ecosystems in the reserve network surrounding Ōrākei Basin are not significant enough to warrant extensive plot-based monitoring of this site. However, the site does receive some monitoring as part of the ongoing biodiversity management by the Auckland Council parks team and contractors.

Council's Research and Evaluation Unit (RIMU) has undertaken to carry out pest monitoring of the site on an annual basis (in July-August). Four 200m long chew-card lines will be established, with ten chew-cards deployed at 20m spacing along each line.

- Cost: Nil.

The site would benefit from some ‘citizen science’ type monitoring of birds and (potentially) native reptiles. It is not important enough – in terms of biodiversity values – to receive bird monitoring by Council. However, regular bird monitoring would be a useful addition to the monitoring program and could be undertaken by interested members of the community. As a minimum, 3 – 4 different parts of the site should be monitored as part of the national garden bird survey on an annual basis. More sophisticated quarterly (or monthly) data from five-minute bird counts in fixed locations around the crater margin would also provide good data on the diversity and density of bird species that utilise the Ōrākei Basin.

- Cost: Nil

Marine Ecology

Recommendations for future survey work include quarterly visual surveys (one of which should be in Oct/Nov to allow for comparisons with our Auckland sites) and sediment cores at randomly selected sites to estimate species diversity and abundance.

Consideration should be given to the restoration efforts that are being carried out that have the potential to increase the ecological health of the Basin. Given the Basin is already depauperate of fauna, further degradation will be hard to detect and improvements are likely to be extremely slow.

The frequency of sampling should be reconsidered following the first year of quarterly sampling, with potential to drop to either annual or biannual sampling to reduce cost.

- Cost:

Core processing: ~ \$250/sample based on multiple cores being processed, plus \$15 per core for sediment grain size, if necessary.

Sampling: Each site will require approximately one hour to conduct a visual assessment and collect four to six cores. Costs would include two technical specialists (\$60/hr if using RIMU staff), logistics and preparation time (~ two hours), and movement between sites, which would have to be determined following the development of a sampling plan.

For example if four sites were sampled, you could expect a cost of:

- \$480 per site x 4 sites = \$1,920
- \$240 prep time
- \$240 travel time (based on two hours)

- \$1000 core processing (this may be less, dependent on the sample composition)
- TOTAL = \$3,400 for four sites

These totals are subject to change dependent on the confirmed sampling plan.

Water Quality (Saline Water Quality Monitoring)

- Cost:

Full standard suite \$102.60 per sample

Full standard suite, metals and *Enterococci* \$180.85 per sample

NB: If just one component of the water quality testing is required, Council's RIMU department can provide a quote separately for each component.

Ongoing sampling should continue to target various weather conditions. It would also be useful to know how long contaminated conditions persist at the various sites so the effects of flushing can be measured.

Key sampling would be to continue monitoring for *Enterococci* during the weeks that the Basin is in high recreational use.

Monitoring algae

Blooms are much more common during the summer months, and routine monitoring should occur during this time, or more specifically during the months of high recreational use. It is likely that this will be December through March.

- Cost:

Samples could be sent to Hills Laboratories who then sub-contract to NIWA at a price of \$175 + GST per sample.

The other option is to send direct to NIWA at a cost of \$169 +GST for identification and enumeration, and if cyanobacteria biovolume is required it is an extra \$34 + GST.

<https://www.niwa.co.nz/our-science/freshwater/our-services/specialist-analytical-services/algae-monitoring-service>

Sedimentation

- Cost:

The costs are highly variable due to the range of methods available to measure historical and current sedimentation rates. A costing can be calculated by Council's RIMU department following further confirmation of how sediment accumulation will be calculated. A budget allocation of \$5000 should be provided for initial monitoring of current sedimentation rates.

Archaeological

Council's Heritage unit has undertaken to complete annual site surveys of the listed archaeological sites contained in the management plan.

- Cost: Nil

Geology

The most important geological features at the Ōrākei Basin are the landform of the tuff ring, and the deposits within the lake that record the eruptive history of the field. Neither of these elements are particularly sensitive to small-scale disruption.

Individual point surveys of individual geological features of the Basin therefore would be of limited value and has not been recommended by Council specialists.

- Cost: Nil

5.0 References

<https://www.aucklandcouncil.govt.nz/parks-recreation/get-outdoors/find-a-walk/Documents/Ōrākei-basin-walkway.pdf>

<https://www.aucklandcouncil.govt.nz/parks-recreation/get-outdoors/coastal-marine/Pages/Ōrākei-basin-bookings.aspx>

<http://www.aucklanddesignmanual.co.nz/resources/articles/universal-design>

<http://www.awsc.co.nz/Ōrākei-basin/>

Auckland Council (2013). Auckland Council Weed Management Policy for Parks and Open Spaces

Auckland Council (2010). Ōrākei Basin Management Plan
Captive Visitor Engagement Survey 2017/18

Kelly, S. (2016). *Ōrākei Basin Boardwalk, Ecological Assessment*. Report prepared for Auckland City Council by Coast and Catchment Ltd Environmental Consultants, February 2016.

Ministry for the Environment and Ministry of Health. 2009. *New Zealand Guidelines for Cyanobacteria in Recreational Fresh Waters – Interim Guidelines*. Prepared for the Ministry for the Environment and the Ministry of Health by SA Wood, DP Hamilton, WJ Paul, KA Safi and WM Williamson: Ministry for the Environment.

Ministry for the Environment and Ministry of Health. 2003. *Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas. Report number 474. Pg 159*

Morphum Environmental Limited (2015). *Eastern Ōrākei Basin Stormwater Review and Recommendations Report – Draft*. June 2015

Oldham, K., Sinclair, J., Yeo, E., & Klein, M. (1996). *Ōrākei Basin Environmental Study*. Report Prepared for Auckland City Council by Worley, July 1996.

Riley Consultants (2013). *Geotechnical Investigation and Preliminary Remedial Measure Design – Ōrākei Basin Access Road, Ōrākei*. 19 June 2013

Sinclair Knight Merz (2011). *Ōrākei Basin Walkway Scoping Study*. 25 August 2011.

Tonkin & Taylor (2018). *Ōrākei Basin Access Road and Car Park – Erosion Issues and Options Analysis – Draft v.3*. June 2018

6.0 Appendix

- A. Ōrākei Basin Advisory Group Terms of reference April 2017
- B. Ōrākei Basin Advisory Group Survey Questions 2018
- C. Archaeological monitoring forms
- D. Captivate Visitor Engagement Survey 2017/18

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