

Polhill Reserve

Formal Assessment of Brooklyn Trail Builders' Proposal

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Introduction

The track proposal has been evaluated in accordance with the Track Design and Track Assessment in the Open Space Access Plan 2016 (OSAP).

The track network in Polhill Reserve provides good connectivity and accessible linkages to the main gateways /entrances to the reserve, and good connections to surrounding suburbs and adjacent reserves.

Mountain biking was introduced to the reserve in 2009 with the construction of shared use tracks. The agreement for mountain biking with Wellington Mountain Bike Club in the reserve was based on a shared trail methodology. Shared use tracks require mountain bikers to ride at a safe speed and give way to walkers and runners.

The current network comprises one track, Serendipity, as bike priority and Clinical track for riding uphill only, and walking two-way. The old ridgeline track (some refer to this as planet ride) from upper Transient to Aro Street is walking only. This track gets little use compared to Transient. The majority of walkers prefer to use the shared use Transient. Transient and Highbury Fling are shared use in both directions.

Waimapihi Reserve sits within the greater Polhill Reserve area. It has limited tracks and is closed to mountain biking. There are three private parcels of land in Holloway Road that have walking only tracks through them.

Polhill is a popular reserve, used by walkers, runners and bikers. The yearly user count from April 2016 to April 2017 is 65,699 with around a 50/50 split between walkers and bikers. For comparison, the track counts on Transient show a daily average of 186 users compared to the southern walkway in Mt Victoria at 533 users.

Assessment (from Section 5 of the OSAP).

Principle	Review	Comments
A wide range of skill and fitness levels, abilities and interests will be catered for by the access network.	The proposed DH bike trail (trail 1) would need to be at the same classification as Transient to ensure all current bike users ride this trail downhill and stay off Transient to reduce conflict from Transient due to downhill bikes.	The current network provides good accessibility for the majority of walkers, runners and riders. The new track proposals do not change accessibility levels.
Key destinations will be able to be easily accessed from main entrances, where possible and reflect Accessible Wellington Action Plan.	The proposed trails do not provide any additional access to key destinations.	
Trails will be shared use, for example, by walkers and cyclists wherever this is appropriate. Tracks will be open for biking unless otherwise stated in this plan.	The proposed descending trail (trail 1) would be a bike priority track, therefore not meeting the shared use principle. The proposed Karepa Street connection (Trail 2) would be walking only. This may require steps. The proposed connection to the fence line of Upper George Denton (Trail 3) would be shared use status.	To meet the objectives of the proposed descending bike trail, which is to remove conflict from Transient the track would need to be bike priority and Transient closed to downhill riding. The new descending bike trail would need to be at the same riding track classification as Transient to ensure all current bikers can continue to access Polhill. Transient would be uphill riding only for bikes, with walking in two directions.

<p>The access network will be integrated with the wider city and regional access networks, and the transport needs of pedestrians and cyclists.</p>	<p>The current track network provides for this and is open to walkers, runners and bikers. It connects suburbs for commuting and connects to adjacent reserves. The additional tracks would not add any greater value to this apart from the Karepa Street proposal. However there are two existing entrances close to this point. The closest current entrance is only 250-metres away, the next closest is 400-metres away.</p>	<p>The proposed descending bike trail will result in a bike priority fast descending track from the wind turbine to Aro Street. This is likely to attract more riders to the reserve and may result in an increase in bike shuttling via cars and vans with trailers. This may cause increased parking issues on Aro Street / Holloway Road. In addition there may be some road safety issues through loading and unloading vans and trailer shuttles on Aro Street/Holloway Road.</p> <p>Traffic engineers have reviewed Aro Street around the Polhill entrance and have determined no additional car parking is available. There is a review of bus stop locations with the potential relocation of a bus stop on the opposite side of the road from the reserve entrance.</p>
<p>Where practicable tracks will cater for demonstrated recreation demand. Demand will be assessed via a number of methods, including, but not limited to surveys, user counts, and public requests for tracks.</p>	<p>The current Polhill track network provides for trail users, riders, walkers and runners.</p> <p>The track counts show good numbers of users (daily average 186) and a 50/50 split of pedestrians and bikers. The track counts have remained at the same level for a number of years.</p> <p>The Polhill user survey shows strong support for separating users (76 percent) and building new tracks (93 percent).</p> <p>The survey shows reasons for visiting the reserve at 80 percent for the current level of tracks and 80 percent for the experience of the natural environment.</p>	<p>There are approximately 100-kilometres of grade 3 trails open for bikers in Council reserves.</p> <p>The Makara Peak Master Plan proposes an additional 16-kilometres of mountain bike trails at grade 3 plus.</p> <p>There are proposals for additional mountain bike specific tracks with loops within the neighbouring Te Kopahou Reserve.</p>

<p>All tracks will be physically sustainable and require minimal long term maintenance</p>	<p>The proposed descending track will sit below and close to Transient. In places this will be on steep cross slopes. The cut batter heights will vary but be up to 1.8m in height in places.</p> <p>A number of earth slips have occurred through Polhill Reserve in recent high rain events. Cross slope stability is of concern when two or more trails are stacked close to each other on steep cross slopes. This can lead to slope instability in high rain fall events.</p> <p>The descending proposal includes “alternative lines”. This would increases the impact of vegetation loss and earth works.</p> <p>The Ashton Fitchett Drive, Turbine access road area currently has four tracks stacked onto of each other. The proposal would see two more added to this. This is poor track network design due to negative impacts on slope stability and vegetation loss. It also forms an overly busy track junction.</p> <p>The descending track is approximately 2.2-kilometres long. At an average of 800-millimetres wide this will result in 1760 square metres of vegetation clearance and approximately 760 cubic metres of earth works and soil displacement. This is based on track design engineer estimates and on best practice (New Zealand standard and International Mountain Bike Association standard) that the track is fully benched to ensure physical sustainability.</p> <p>Refer to environmental assessment.</p>	<p>The addition of another track below Transient on the steeper hill slopes may increase the risk of hill slope slips in heavy rain events.</p> <p>It is recommended that a Geotech engineer is engaged to review any approved track alignment to provide advice, potential amendments and engineer solutions that may be needed to reduce any noted risks to hill slope instability and track sustainability.</p> <p>Adding tracks to the existing stack of tracks below Ashton Fitchett Dr and the Turbine access road may increase the risk of hill slope slips in heavy rain events. It will result in a larger open canopy in a relatively small area. This is poor track design based on sustainability principles.</p> <p>The stack of tracks in this area can be reduced with the proposed descending track using one of the existing tracks (Proposal 1a). Uphill and downhill traffic can still be separated with this option. The existing flight of poorly designed steps off Aston Fitchett Drive adjacent to this area could be removed (Proposal 5) and the open area planted in native species. Track building will adhere to IMBA standards and NZ Cycle Trail design guide.</p> <p>Any new trail would need to be maintained by BTB as WCC do not have maintenance budget for the additional tracks.</p>
<p>All tracks will have minimal environmental impact</p>	<p>See attached environmental assessment (Appendix A)</p>	
<p>Pest control, emergency services, and general management purposes will be catered for by the access network, where appropriate.</p>	<p>Polhill Reserve is extremely well served for pest control. Additional tracks are not required to assist with this.</p> <p>Additional tracks and their users may introduce more pests. The new tracks will see more weed pests introduced into the reserve.</p> <p>Dogs off lead in ecologically sensitive reserves through the reserve network are a threat to native bird species. The Polhill Protectors have been working</p>	<p>The current pest control management in this area does not require any additional access points.</p> <p>More tracks may result in easier access for predators.</p> <p>The BTB and Wellington Mountain Bike club to work with the Council to encourage a no ‘trail dogs’ principle in ecologically sensitive areas such as Polhill Reserve.</p>

	with WCC to encourage all track users in Polhill to have their dogs on lead as per policy.	
Tracks will be signed and maintained to defined standards, with significant hazards identified and/or mitigated.	The descending bike track would be signed bike priority Grade 3.	
Designated tracks may be declared open for horse-riding.	Closed to horses	
All tracks are closed to motorised vehicles except by special permission on a case-by-case basis and in accordance with policies within the Reserve Management Cluster Plans	Closed to vehicles	
Electric bikes will have restricted access. An electric bike (e-bike) is defined as a bicycle primarily pedal powered by human energy and may be assisted by up to 300watts of battery power, as well as limited to 25km/h . Refer Schedule D of this plan for tracks open to e-bikes use. All other e-bikes are regarded as motorized vehicles.	Closed to e-bikes	
Some tracks within the network will be accessible to those with limited mobility, push chairs and wheel chairs.	<p>The descending bike track to be Grade 3 providing the same accessibility for walkers as Transient.</p> <p>Other proposed tracks to be at a “short walk” or “walking track” standard.</p>	<p>The track proposal does not provide for those with limited mobility or wheel chairs.</p> <p>The proposal does not change the current accessibility levels of the reserve.</p>

Assessment Category	Review	Outcome
<p>Environmental impact</p> <p>–Tracks must be well planned and maintained, taking into consideration the guiding principles in 5.1 and priorities and actions to protect and restore biodiversity in accordance with Council’s Our Natural Capital (Wellington’s Biodiversity Strategy and Action Plan 2015).</p>	See separate assessment of environmental effects (Appendix A).	Proposal does not meet the Environmental Impact guiding principles in the Open Space Access Plan.

<p>User group conflict</p> <ul style="list-style-type: none"> - A track is unsuitable for shared use when conflict between users is unable to be mitigated. 	<p>Descending track proposal to be bike priority. Karepa connector to be walking only. Fence line connector to be shared use. The proposed descending bike track will intersect existing tracks in three places. Two of these are crossing walk only tracks. It is likely that bikes will be travelling at speed on the descending bike track and this may cause concerns at these crossings points.</p>	<p>Mountain biking was previously prohibited in Polhill Reserve. Biking was permitted with the addition of new tracks. This change of use is based on a shared use model where riders are expected to travel at a safe speed and give way to walkers.</p> <p>The proposed descending track will remove descending bike pressure on Transient. All track crossing points will need to be designed so that bikes are travelling very slowly and have good site lines at these points.</p> <p>Bikers will need to adhere to the trail code of conduct on the remaining shared trails in Polhill.</p>
<p>Public safety</p> <ul style="list-style-type: none"> - Speed of travel must be controlled for safe, shared use of tracks. For example, bike speeds may be slowed using track construction methods such as tight corners, or “switchbacks”, and reverse gradient designs. If shared two way use is not safe then consideration shall be given to separating potential user conflict. 	<p>As above regarding crossing points</p>	<p>Design measures will be required where tracks intersect to ensure bikers are travelling at very low speeds or stopping at the intersections. Site lines will need to be good at all crossing points.</p> <p>To meet the objectives of overcoming any issues with downhill direction of bikes on Transient, Transient would need to be closed to all downhill riders when the new downhill descending bike priority track is open.</p> <p>It should be noted that additional design measures can be added to Transient to reduce downhill riders travelling at speed into blind corners.</p>

Discussion

There are risks associated with the track proposals. These include increased impacts on hill cross slopes, the descending bike track creating points of conflict at the crossing points of existing tracks, potential parking issues and road safety at the end of Aro Street and the start of Holloway Road, and impacts on four threatened bird species. Polhill Reserve has established tīeke (saddleback) territories and is the only reserve where breeding has been confirmed. This makes Polhill Reserve unique in the reserves network. The likely negative impact on the ecological values of this reserve by increasing tracks is considered to be high. The independent assessment of environmental effects advises a precautionary approach should be taken when considering new tracks. Based on all these factors, the track proposal does not meet the conditions for approval as set out in the Open Space Access Plan.

Recommendation

Council officers' recommendation is that the ecological values of Polhill Reserve should take precedent over adding new tracks.

Officer's recommend the focus on new bike tracks should be concentrated in other areas, such as close-by Te Kopahou Reserve and Makara Peak Mountain Bike Park.

However, given the survey results showing strong demand for some form of separation to relieve the pressure on Transient, officers support the descending bike proposal with a small number of modifications. This will help to reduce the vegetation loss and the soil disturbance. This support is based on descending bike traffic on Transient stopping when the new descending trail is opened. The agreed proposed descending alignment should be reviewed and mitigation measures determined through professional input from track designers, a geotech engineer, and an ecologist.

To minimise the environmental impacts from track building, officer's advice is to decline the new walk-only track to Karepa Street and the extension of Clinical to the fenceline. This is to minimise vegetation loss and soil disturbance associated with track building. Officers also recommend that the existing track that runs steeply down the hill to Waimapihi Reserve is closed and planted, and the poorly designed steps from Ashton Fitchett Drive are removed and this open area is replanted with native species. This would add to vegetation cover in the reserve.

There are other alternatives to any new track builds within Polhill Reserve that could overcome the concerns of descending traffic on Transient.

Alternative options that can be considered would include:

1. There are opportunities for extending the track network into the neighbouring Te Kopahou Reserve, which can meet the demand for downhill mountain bike tracks. This additional network can also create a destination area for bikers and walkers, removing some of the demand on Polhill Reserve.
2. Design options on Transient to slow downhill bike riders
3. Review circulation of users within Polhill. For example
 - I. Transient downhill riding only while the old Polhill ridgeline track is improved for walking only.
 - II. Clinical is downhill riding only and the old George Denton track is improved for walking only.
 - III. Transient is uphill riding only and the old George Denton track is improved for downhill riding only.
4. Invest in an educational programme to emphasis trail etiquette within shared use reserves and emphasis track users responsibilities to respect all users. This programme to be on going and across all of WCC shared use reserves.
5. Time sharing for user groups. Based on overseas models in City of Golden, Colorado – for example Tuesday and Thursday evenings reserve for riding only, other week days and evenings for walkers, runners, Saturday riding only, Sunday walking, running only.

Notes:

- a) All track build work regardless of community build or contract build requires council officers to inspect the marked line before any build work starts, including vegetation removal. Adjustment to marked line may result so that notable vegetation and hill slope concerns can be addressed.
- b) It is recommended that a geotech engineer is engaged to assess and provide guidelines to noted points along a marked line regarding hill slope stability. This must occur before track build starts.
- c) If the proposed descending bike track is commissioned an agreed survey on the effects of the nesting and breeding saddle back will need to be in place before track work begins.
- d) All required resource consents for structures in a conservation site (WCC) and stream crossing (GW) need to be gained before track build starts.

Appendix A - Polhill track proposal - Assessment of environmental effects

Polhill Reserve comprises approximately 75 hectares of secondary indigenous forest. This includes about four hectares of rewarewa (*Knightia excelsa*) and exotic conifer-dominated forest separated from the main part of the reserve by Aro Road. The secondary forest established after historical heavy grazing. The canopy is dominated by mahoe (*Melicytus ramiflorus* subsp. *ramiflorus*), although tawa (*Beilschmiedia tawa*), titoki

(*Alectryon excelsus* subsp. *excelsus*), and rewarewa are also evident. The vegetation in more exposed parts of the reserve comprises exotic conifers (*Pinus* spp.) and mahoe-gorse (*Ulex europaeus*)-Darwin's barberry (*Berberis darwinii*) scrub. The Reserve provides indigenous vegetation cover for the Waimapihi Stream headwaters (NIWA 2007).

The reserve has ecological features and values that are regarded as important in Wellington City. These are listed below:

- Includes a primary forest remnant (Park 1999);
- Conservation site 3c in the WCC District Plan;
- Partially buffered by indigenous vegetation;
- Riparian areas are primarily indigenous vegetation;
- The area contains and protects multiple streams.
- The area is also contiguous with the Zealandia, buffering it and forming part of an extended foraging habitat for its high conservation value bird species.¹

An Assessment of Environmental Effects was carried out in accordance with the Open Space Access Plan 2016.

There are important considerations when providing public access to certain areas while preventing access to other areas, and making sure that important habitats are protected.

This should include an assessment of the actual and potential effects on the environment, a description of available alternatives if effects are significant and a description of how any adverse effects may be avoided, remedied or mitigated. All track development should minimise disruption to natural ecosystems during construction and subsequent use.

Where it is not practical to protect vulnerable ecosystems and habitats, and environmental assessment shows that remediation and mitigation of impacts are not possible, then track development will not be allowed.

Tracks within Significant Ecological Sites (as outlined in Appendix 4 of Our Natural Capital) need particular consideration.

Polhill Reserve has been identified as a Significant Ecological Site, as well as a Conservation Site (3c) in the District Plan. In accordance with the Open Space Access Plan 2016 any tracks in this area should:

1. Avoid acutely threatened ecosystems or habitats

Ecosystems or habitats are classified as acutely threatened if there is less than 10 percent of the pre- 1840 coverage of that ecosystem or habitat remaining. These ecosystems or habitats include areas of original forest (of which only 5 percent is left in Wellington) and streams.

The proposed track will avoid acutely threatened ecosystems and habitats. The area the track is going through is regenerating mahoe forest. This is an 'at risk' land environment (20 to 30 percent of indigenous vegetation left) as opposed to acutely threatened.

2. Avoid known locations of threatened species and their habitats

Tracks may degrade or fragment wildlife habitat, and can also alter the activities of nearby animals, causing avoidance behaviour. While most forms of track impact are limited to a narrow track corridor, disturbance of wildlife can extend considerably further into natural landscapes. Even localised disturbance can harm rare or endangered species.

Disturbance from recreation has at least temporary effects on behaviour and movement of birds.² The track is going through known habitat of tieke, kākā and karearea. Hihi have also been reported in

¹ Weed Control and Restoration Planting in Polhill Gully Reserve and George Denton Park, Wellington City. Wildlands 2010

² Bennett, K. A. and E. Zuelke. 1999. The effects of recreation on birds: a literature review. Delaware Natural Heritage Program, Smyrna, DE 19977

the surrounding area. As these are confirmed reports through formal surveys, the abundance and distribution of these species is likely to be under-reported.

Polhill is one of two Wellington City Council reserves (out of 425) where tīeke have established territories, and the only reserve where breeding has been confirmed. This increases the significance of this reserve to Wellington's tīeke population.

When animals flee from disturbance by track users, they often expend precious energy, which is particularly dangerous for them in winter months when food is scarce. When animals move away from a disturbance, they leave preferred or prime habitat and move, either permanently or temporarily, to secondary habitat that may not meet their needs for food, water, or cover. Visitors, however, are often unaware of such impacts, because animals often flee before humans are aware of the presence of wildlife³.

Several studies document negative impacts on breeding birds of recreational trails as narrow as 1m wide in forest⁴. The negative impacts included decreased nesting near trails, altered bird species composition near trails, and increased nest predation.

Sensitive species such as tīeke are prone to disturbance and increased stress levels may impact on breeding. Studies have shown bird species experience increased levels of stress during periods of increased human activity⁵. As Polhill is already popular with track users, additional tracks would be expected to have moderate to heavy use, exacerbating these effects on sensitive bird species.

There are currently two areas within Polhill Reserve where the distance from the track allows for little disturbance. The area where the track is proposed is one of these areas. Studies have shown that the active disturbance distance across a large range of bird species was 250-410m⁶. The current distance between tracks in this area of Polhill Reserve is 130m to 225m. So the furthest from a track that sensitive bird species can be is 112.5m, which is already well within the active disturbance distance. Adding another track in this area would reduce the active disturbance distance to between 50m and 80m. There is a high risk that this will increase the future impacts on bird species, particularly during incubation and chick rearing.

These species tend to nest in sheltered areas and often near streams. The gully where the track is proposed is ideal breeding territory for tīeke and hihi. A new track will allow dogs to access the area, as well as provide potential routes for cats and other predators. The track will not offer additional benefits to these species with regards to enhanced predator control as this area has sufficient trap coverage already.

There is support in the literature for the hypothesis that the effects on some species of wildlife are more pronounced with mountain bikes than they are with other forms of recreation, primarily related to the 'sudden encounter' effect⁷. This effect is pronounced when fast moving track users startle species. As the proposed track is a downhill mountain bike priority, this sudden encounter effect can be expected for sensitive species.

³ Marion, J. & Wimpey, J. 2007. Environmental Impacts of Mountain Biking: Science Review and Best Practices. International Mountain Bicycling Association.

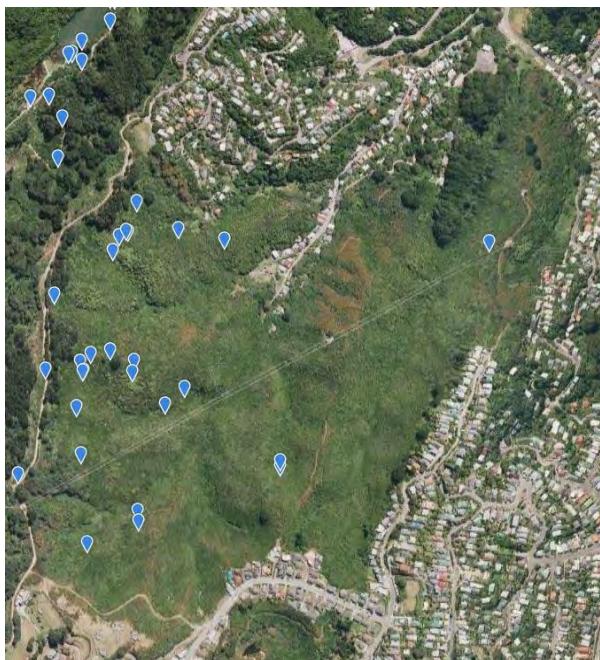
⁴ Miller, S. G., R. L. Knight and C. K. Miller. 1998. Influence of recreational trails on breeding bird communities. Ecological Applications 8:162-169.

⁵ Thiel, D., Jenni-Eiermann, S., Braunisch, V., Palme, R., & Jenni, L. 2008. Ski Tourism Effects Habitat Use and Evokes a Physiological Stress Response in Capercaille *Tetrao urogallus*: A New Methodological Approach. Journal of Applied Ecology, vol.45, pp.845-853.

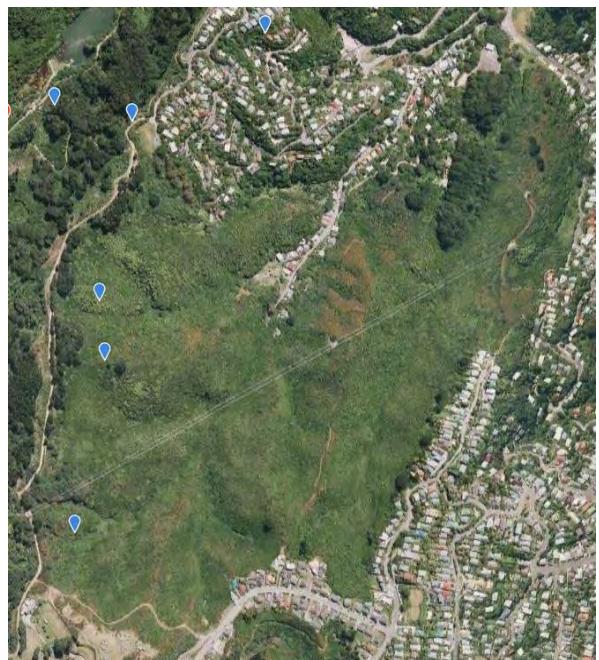
⁶ Ruddock, M. & Whitfield, D.P. 2007. A Review of Disturbance Distances in Selected Bird Species. Natural Research Projects Ltd.

⁷ Quinn, M. & Chernoff, G. Mountain Biking: A Review of the Ecological Effects. 2010. Miistakis Institute

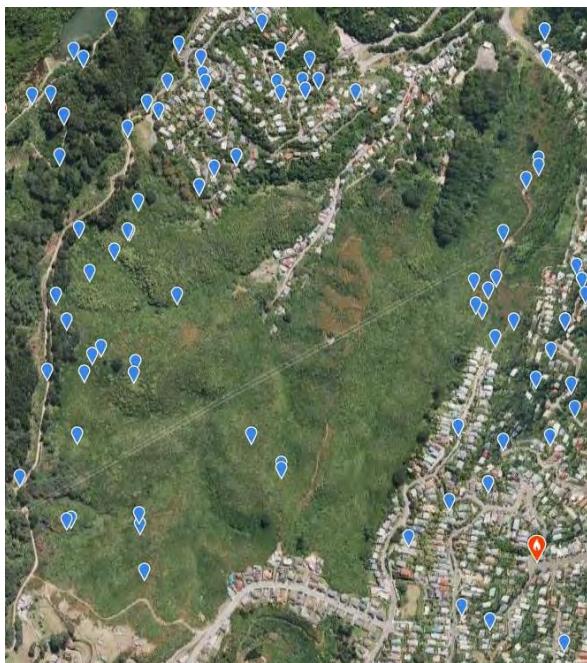
Figure 1: Confirmed locations of nationally threatened and at risk bird species in Polhill Reserve (data from ebird.org).



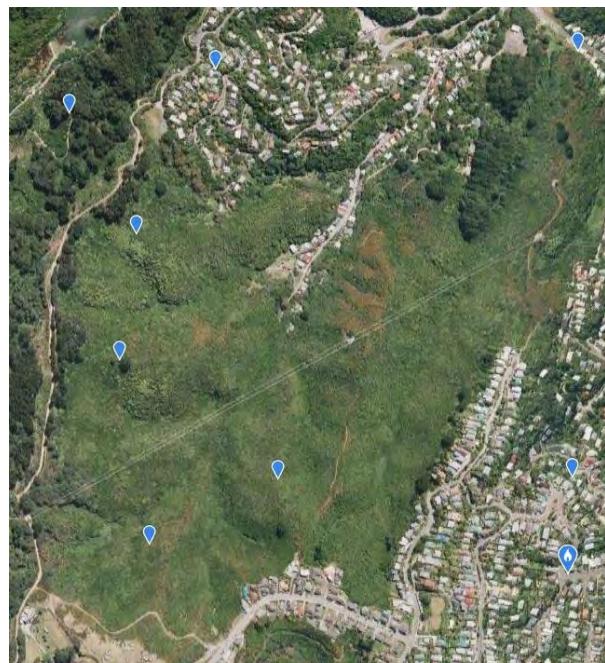
Tieke



Hihi



Kākā



Karearea

3. Provide buffers to protect acutely threatened ecosystems or habitats

Maintaining buffers between tracks and threatened ecosystems or habitats is essential to ensuring their long-term ecological health. Irrespective of how well they are aligned and designed, tracks have an impact, including habitat fragmentation, soil compaction, damage to root systems, increased runoff and erosion, and introduction of weed species. The recommended buffer width will vary in response to a range of conditions.

Erosion and the introduction of weed species are of key concern along the proposed alignment. The existing ‘Transient’ and ‘Clinical’ tracks have a high concentration of weed species along their length. The most common weed species are gorse, darwin’s barberry, and blackberry. Old Man’s Beard was also seen along the track edge. These species aren’t seen in the same density under the existing canopy, so the increased light levels and spread through track users have had a significant impact on weed density within these areas.

The regenerating vegetation around the edges of the reserve provides an important buffering function to the reserve, and the overall health of the reserve could be detrimentally affected if this buffering vegetation was to be removed.

There are also concerns around the number of small tributaries that may run down the slopes into the stream bed. A report by engineers⁸ looking at a similar track proposal noted the need for 11 stream crossings (likely to be ephemeral). These would need to be ground-truthed to evaluate extent.

4. Develop appropriately when tracks intersect with acutely threatened ecosystems or habitats

On occasions, the development of tracks across, along, and within acutely threatened ecosystems or habitats can be acceptable. Access to these areas can form an integral part of educating the public about their value. This may result in a track along the edge of a threatened habitat, or a stream crossing, with appropriate mechanisms for protecting species of significance (such as boardwalks over tree roots and wetlands). This approach provides reasonable access while limiting the potential for environmental impact. In addition, any track development should follow best practice as outlined in City and Regional Plans.

The proposed track will not be intersecting with acutely threatened ecosystems or habitats.

5. Avoid or minimise impacts within the dripline of significant trees and avoid root disturbance

Significant trees are any tree species that are threatened or uncommon in Wellington, or individuals that are unusual or uncommon within the site where development is proposed. These trees are often landmark features and should be protected. Some trees are more susceptible to damage than others and this should be taken into consideration.

The proposed track alignment will need to be walked to establish the presence or absence of significant trees. Tawa (*Beilschmiedia tawa*), titoki (*Alectryon excelsus* subsp. *excelsus*), and rewarewa are evident within this area and need to be avoided. This may be challenging given the topography of the area.

6. Avoid the creation of canopy gaps in established tree canopy

The creation of canopy gaps can alter the internal structure of the forest. Canopy gaps allow an increase in light as well as changes in moisture and wind levels, leading to differences in microclimate conditions. When the canopy is considered mature (at 6-metres), disturbance to that canopy should be avoided. To help achieve this, switchbacks should be avoided where practicable.

Due to the steep nature of the terrain, the creation of canopy gaps seems unavoidable.

Microclimatic changes through the creation of canopy gaps (increased sunlight, increased rainfall due to reduced canopy interception, increased wind, decreased humidity, altered temperature regime, etc.) have

⁸ Frame Group Limited. 2016. Polhill Reserve Downhill Track.

been documented along forest tracks wide enough to open up the canopy⁹. These microclimatic alterations could result in plant species changes and might also affect wildlife.

As well as allowing light in and facilitating the introduction of weed species, increased wind entering under the canopy can create desiccation on the forest floor and affect the plant and animal communities. The drying out of the forest floor can alter the insect community which can have an impact on the insect community and therefore the insectivorous birds living within this habitat (notably tieke and north island robin).

7. Avoid excess soil disturbance and retain organic material

Care should be taken to cause minimal disturbance to soil and surrounding vegetation (including root systems). Within acutely threatened ecosystems or habitats, excavated soil should be relocated, not sidecast. This will avoid negative impacts on surrounding vegetation and nearby waterways. Relocated material can be used to even out grades, cover tree roots, or fill steps and retaining walls. Leaf litter and cut native vegetation should be retained for spreading over exposed earthworks. This can reduce sediment runoff and contains an enormous amount of seed that will enhance restoration of the site.

The steep nature of the slope in this area raises concerns about erosion and future slips. This poses a risk to the streams at the bottom of the gully.

Summary

Polhill reserve is a popular mountain bike destination area. It is also heavily used by walkers, dog walkers, and runners. Any additional track in this area can expect moderate to heavy use.

The proposed track avoids acutely threatened ecosystems and habitats. However, it goes through the habitat of four threatened avian species. Due to the structure of the forest and the slope, it is unlikely that canopy gaps can be avoided. The impacts on any significant trees could potentially be avoided, but the steepness of the slope will also make it difficult to realign the track. In addition, due to the height of the required cuts if a significant tree is on the track alignment it is unlikely that root disturbance will be avoided.

The predominant risk posed by this track proposal is to the threatened and locally significant bird species found within this reserve. The direct disturbance by having a track within the habitat of these birds poses a direct risk to their nesting success and the success of their fledglings. There is also a risk to the forest structure through opening up the canopy, introducing weed species and increasing the potential for slips.

When assessed against the criteria in the Open Space Access Plan, and given the significance of the bird species found here, it is advised that a precautionary approach is taken.

⁹ Jordan, M. 2000. Ecological Impacts of Recreational Use of Trails: A Literature Review. The Nature Conservancy.