Your Comment on the Rotokauri North Stage 1

All sections of this form with an asterisk (*) are mandatory.

1. Contact Details

Please ensure that you have authority to comment on the application on behalf of those named on this form.

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2. *We will email you draft conditions of consent for your comment

X	I can receive emails and my email address is correct	☐	I cannot receive emails and my postal address is correct

3. Please provide your comments on this application

Thank you for the opportunity to comment.

Although the proposed subdivision site has been highly modified, it still has conservation value for lizards and freshwater, and contains suitable habitat for the critically endangered long-tailed bat. Although these values have been assessed in the information provided with the application, proposed mitigation measures have generally not been carried through into the proposed conditions.

The comments below address the values and make some suggestions for consent conditions. However, given the lack of coordination between the application and the proposed conditions, it is likely that more detailed review of consent conditions will be required.

Effects on lizards

- No evidence has been provided in the supporting documents that a lizard survey was undertaken in the Stage 1 area. All that is provided is a statement from a Tonkin & Taylor document from 2019 that no at risk or threatened species are likely to be present, but that copper skink are likely to be present (e.g., part 7, page 86 of Attachment 16 – Ecology Assessment). On this assessment, effects were deemed to be low. Mitigation to address effects was to provide micro-habitat features (not specified where).
- Copper skinks were classified as not threatened at the time of writing of the earlier report (T & T 2019). Copper skinks have since been declared threatened – declining.
- The plan is to remove all existing features, including vegetation and waterways throughout the Stage 1 area. This will result in the death of any residual copper skink population. There will be no lizards left to

return into the site, so provision of micro-habitat after the fact will not avoid, mitigate or remedy this effect. The killing of absolutely protected wildlife is also an offense under the Wildlife Act 1953. The presence of copper skinks (a threatened species) also makes any areas of skink habitat an SNA under the Waikato Regional Policy Statement.

- No provision has been made in the proposed conditions to address the effects on lizards.
- I recommend a new condition be added to the conditions that requires the production of a Lizard Management Plan for approval prior to any works starting. The LMP should have an intention of protecting and enhancing lizards and their habitat within the Hamilton City Council boundary, in accordance with objective 2.2.12 of the Hamilton City District Plan. The LMP should contain as a minimum the following:
    - An outline of the survey method that will be undertaken. This survey should follow best practice.
    - The salvage methods that will be undertaken.
    - Pre-approval to translocate salvaged lizards to an agreed destination (agreement will need to be sought from the consenting authority, DOC and Iwi/hapuu).
    - The actions that will be undertaken to compensate for the loss of lizards and their habitat within the Stage 1 area.
    - Provision to seek an authority under the Wildlife Act 1953 to undertake salvage and translocation of protected wildlife.

Effects on native fish, including black mudfish

- Surveys for fish in the Ohote Stream and associated drain network have been undertaken using minnow traps and eDNA. Survey locations were mostly outside the Stage 1 area. Two survey sites were within the area, at the very extremes of the site. Absence of mudfish is claimed because of the failure to detect mudfish in the eDNA samples.
- There is significant uncertainty using results from eDNA for fish species in watercourses with little or no flow (Greenway Mudfish Management Plan – working draft for consultation. Tonkin & Taylor 2021). Consequently, trapping (e.g., Gee minnow traps) are the preferred method. Trapping needs to be intense to pick up mudfish, which can be very localised, especially when water levels are low, such as summer-autumn.
- Attachment 16 Ecology Assessment also makes some assumptions about mudfish that are not substantiated by evidence in the document.
    - The first is that mudfish are not present because of downstream obstacles to fish passage. In fact, downstream obstacles may prevent predators of mudfish getting upstream so could be a reason for mudfish to persist.
    - The second is that the created stormwater wetlands will be mudfish habitat. In fact, no projects have achieved successful creation of black mudfish habitat. This includes projects that had creation of mudfish habitat as a specific objective, something not being sought by this project.
- I recommend a new condition be added to the conditions that requires the production of a Mudfish Survey Plan for approval prior to any works starting. The MSP should have an intention of having a very high probability of detecting mudfish if they are present within the Stage 1 footprint. The LMP should contain as a minimum the following:
    - An outline of the survey method that will be undertaken. This survey should follow best practice.
    - Actions that will be taken if mudfish are detected. Actions should be guided by the Rotokauri Greenway Mudfish Management Plan.

Stormwater Wetlands

- I agree with the assessment in Attachment 16 Ecology Assessment, that the landscape in Stage 1 is greatly degraded due to historic wetland drainage, ongoing drain and stream clearance not intended to improve water quality, intensive grazing and cropping, and a failure to keep stock out of waterways.
- I recommend improvements or greater specificity in the design of the stormwater wetlands. These wetlands are intended to intercept contaminants (e.g., heavy metals) and sediment from construction and the future urban environment. Many of the stormwater systems built in urban areas of Hamilton to date have not been / are not effective at serving this purpose. Two examples are provided below.
    - Example 1: An example of where sediment management has become an issue for Hamilton City is Magellan Lake. HCC has sought to change the lake to a design to better suit its purpose as a sediment trap. This has been very difficult to achieve due to concerns from adjoining landowners.
    - Example 2: Stormwater wetlands in the new subdivision off Pardoa Road. DOC staff have witnessed after relatively light rain (less than the 20mm per 24-hour period in Attachment 30 proposed conditions), inflows to these wetlands carried a substantial amount of sediment.
- Sediment and contaminant removal need to be allowed for in the design of the stormwater wetlands or they will eventually fill in and will no longer perform their design function.

    - Dealing with sediment and heavy metal runoff (which is going to be the main problem in an urban stream) is more feasible with sediment trap type designs.
    - This will require access for machinery to clear sediment.
- It would be better to be proactive and incorporate the ability to maintain sediment load in the bed of the stormwater wetlands in the design.

Ohote Stream realignment

- I do not oppose the removal of part of the Ohote Stream and its eventual replacement with a created water course, subject to a proper survey for mudfish as proposed above.
- A condition should be added to specify the purpose of the Ohote Stream. Preferentially, this should be to protect and enhance the natural habitat for indigenous fish (as claimed in Attachment 16 Ecology Assessment). This condition should have measurable standards that must be achieved and monitoring that will be undertaken to ensure this purpose is met. These should include, but are not limited to:
- Temperature management
    - Water depth: The design should be changed to maintain (or create) a narrow deep channel. This is the closest proxy to a wetland channel (original natural habitat for the area) and is good for temperature regulation. If a 2-stage ditch design was implemented, a narrow and deep river channel could be set within the proposed floodplain concept from the plan, so no hydraulic functionality required for storm drainage would be lost.
    - Shading: Larger plants should be planted on the northern stream banks for shading (could be introduced or native trees). These do not need to be on the edge of the waterway, as long as they are close enough to provide shade for part of the day.
- Habitat complexity
    - Bank and instream habitat: Reeds, carex and flax should be planted on the edge of waterways along both banks to provide fish cover and spawning habitat. Design should include addition of logs to the stream for habitat, hydraulic complexity and addition of carbon.
    - Lighting: Avoid lighting near waterways, especially on bridges. Lighting can be detrimental to passage and flight paths of adult freshwater invertebrates. Lighting along waterways can also affect bats.

Background Information on bats

- Hamilton is one of the few cities in New Zealand that still has long-tailed bats. The long-tailed bat is classed as “nationally critical”, which is New Zealand’s highest threat category (the same as the kākāpō). This means that the population has a high or ongoing predicted decline (>70%) resulting in a high threat of extinction over the next three generations or 10 years (whichever is longer) (O’Donnell et al 2018).
- Declines in bats are due to a combination of threats including loss of habitat from land clearance, predation and competition from introduced predators, habitat degradation, fragmentation and disturbance at roosts. Introduced predators including rats, cats and possums have all been implicated in the decline (O’Donnell 2000a).
- Long-tailed bats live a long time (>20 years). Adult females begin breeding between 1-3 years old and only produce one pup a year (O’Donnell 2000b). Slow breeding and living a long time means bats can persist in the environment but can then suddenly disappear.
- Long-tailed bats roost in tree hollows. The trees they choose have specific qualities in terms of warmth and humidity so they are not just choosing any tree. Adult females congregate together in the breeding season to have their young in maternity roosts. Long-tailed bats can move roosts every day and carry their young with them. They require a large number of trees in the environment so that they have enough choice and resilience (O'Donnell & Sedgeley 1999).
- Foraging areas for bats are large. In the Eglinton Valley in Fiordland the colony of bats range over 12000 ha and bats are known to travel 19 km to foraging areas (O'Donnell 2001). In Hamilton the accumulated foraging ranges was 7000 ha (Davidson-Watts Ecology Ltd 2019). This means management areas for bats need to be large to include foraging, roosting, commuting and social areas.
- At this stage bats cannot be translocated so once we lose them from an area we won’t be able to bring them back. Bats have a strong homing instinct so if they are moved they will try to get back to their original site (Guilbert et al 2007). As a colonial species they are very difficult to keep in captivity and are subject to disease. This means that the risk of breeding bats in captivity to translocate the young is too high to consider as a management technique at the moment (Parker et al 2015).

The significance of the Rotokauri site for bats

- Although bats have not been detected on the site there have only been two small surveys done by the applicant, each with only 11 recorders. One was done in December 2019 and one in March 2020. A subsequent independent survey was done by Dixon 2020 but again this had minimum recorders in the subdivision area (Ecoast 2022). This is not adequate to say there are definitely no bats there. There are bats within 3km of the site so it is likely that bats do forage or commute over the proposed site at some stage.
- The ecological report identified possible bat habitat including foraging, commuting and roosting sites (Tonkin & Taylor 2021) The main colony of bats that we know about in the Hamilton area are 10 km south of the site. It is possible that these bats currently forage and commute over the proposed development site.
- The potential impacts of the Rotokauri subdivision are direct deaths through felling of roost trees, loss and fragmentation of feeding habitat and shelter within the subdivision, the loss of potential and future roost trees, increased noise and lighting in the subdivision, impacts of construction noise on feeding, impacts of increased traffic and the increase of urban predators eg. cats. These effects could contribute to the decline and subsequent extinction of the Hamilton bat population.

Reducing the effects on bats

- Although the surveys did not detect bats on the site, they have been detected 3km away. As bats are a highly mobile species and can travel several kilometres in a night, I would recommend the precautionary approach and assume bats use the site.
- The plan states that all vegetation on the site will be removed including shelter belts and mature trees. In my opinion there has not been enough consideration to avoiding the removal of vegetation. Avoidance of the removal of vegetation particularly potential bat roost trees (indigenous or exotic) should be the first step in the mitigation hierarchy.
- If any potential bat roost trees have to be removed, then the DOC approved Bat Roost Protocols must be followed to lower the risk of killing bats.
- Once the vegetation is removed, bat habitat will be lost and the area may no longer be suitable for bats. Any planted vegetation such as the green corridor proposed will provide some foraging and potential commuting area with time, but roosting trees will take over 20 years to form.

Potential Mitigation

- It is concerning that, despite the critically-threatened status of long-tailed bats, and the fact that the Ecoast ecological report included with the application recommended various mitigation measures, those measures were not reflected in the applicant's proposed conditions. This includes development of a Long-Tailed Bat Management Plan, and adoption of the DOC-approved Long-tailed Bat Roost Protocols.
- I therefore consider the following mitigation measures are required to minimise potential impacts on bats. They should be included in specific consent conditions, and further detailed in a Long-tailed Bat Management Plan.
- Protecting dark corridors so that bats can move across the landscape is essential. The green corridor suggested could be this corridor **if** it is linked across the landscape. Bats can fly over open spaces but travel is enhanced by vegetated corridors that provide dark safe areas. Linking these corridors over the larger landscape is required to make them functional and connected.
- Lighting needs to be addressed in the conditions. The recommendations for bats are based on the European lighting standards for bats (see Appendix1) They include:
    - keeping lighting in bat priority areas below 0.1 lux.
    - in areas where lighting is required use downward facing lights, preferably sensor-triggered,
    - avoiding lights with a wavelength of less than 560nm (avoiding blue light)
    - using lights with a colour temperature of 2700K.
- New Zealand has signed up to the Convention on Migratory Species that also requires light restrictions (Appendix 2). Bats are considered a migratory species as they travel long distances.
- Measures to protect bats from predators are also required. There is clear evidence that cats prey upon bats (Oedin et al 2021). The Environment Court decision for the Amberfield subdivision (south of Hamilton) accepted this and imposed a ban on domestic cats as a condition of the development. Given the scale of residential subdivision around Hamilton, it will be critical to the survival of bat populations that these controls are applied consistently across the overall scope of development, so the same cat ban requirement should be applied to these consents.

References

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Appendix 1

In the absence of specific lighting standards for bats in New Zealand the Bat Recovery Group (NZ) follows the Eurobat guidelines.

WEB_EUROBATS_08_ENGL_NVK_19092018.pdf

	Measure	Recommendations
Avoidance	*Conserve dark areas*	High priority areas that should remain dark: • protected areas, including roosting and underground hibernation sites • feeding areas (natural areas, vegetation patches) • commuting routes (forest edges, hedgerows, rivers, tree lines)
Only if lighting is necessary, and after an assessment of bat occupancy and patterns of activity within the landscape framework of functional habitats:		
Mitigation	*Part-night lighting*	Turn off public outdoor lighting within **2 hours after sunset** (civil twilight): • Especially during bat reproduction and migration periods • Particular attention within home ranges of maternity colonies
	Dimming	• Adapt dimming strategy to human activities • Keep illuminance levels as low as possible according to EU standards (not going over minimum illuminance required)
	Avoid light trespass	Avoid light trespass over 0.1 lx on surrounding surfaces: • Use fully shielded luminaires • No illumination at or above horizontal • Control street light height, especially along pedestrian pathways and tree lines • Use fewer light sources at points low to the ground • Consider the interaction between light from luminaires and reflecting structures, such as roads and walls
	Adapt lamp spectra	Avoid lamps emitting wavelengths below **540 nm** (blue and UV ranges) and with a correlated colour temperature > 2700 K
Compensation	*Restore dark areas*	No net loss of darkness: • Restore darkness to the same extent as the proportion of dark areas lost • Enhance alternative dark corridors that connect roosts and feeding areas

Appendix 2

New Zealand is a signatory to the Convention on Migratory Species (CMS). CMS endorses the following guidelines: National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds - DAWE Whilst CMS focusses on migratory species, which they define as species which cross national jurisdictions, NZ bat species travel just as long distances as species in, for example, Europe but are not considered "migratory" simply because there are no national borders nearby. These guidelines are also, therefore, relevant to New Zealand bats (and other species' groups).

The copied link connects directly to the AU Government page with links to the guidelines, these "guidelines provide:

- a framework for how to assess and manage the light pollution impacts on protected wildlife
- detailed guidance for how to manage artificial light
- specific advice on how to protect marine turtles, seabirds and migratory shorebirds."

Best practice lighting design incorporates the following design principles.

1. **Start with natural darkness and only add light for specific purposes.**
2. **Use adaptive light controls to manage light timing, intensity and colour.**
3. **Light only the object or area intended – keep lights close to the ground, directed and shielded to avoid light spill.**
4. **Use the lowest intensity lighting appropriate for the task.**
5. **Use non-reflective, dark-coloured surfaces.**
6. **Use lights with reduced or filtered blue, violet and ultra-violet wavelengths.**