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Mt Welcome responses to section 51 and 53 comments	**To: William Dorset**
	From: Dr Vaughan Keesing
Date:7.08.2026	**Project title:** Mt Welcome

The following is a set of responses to ecological queries and comments raised by GWRC, DOC and PCC, usually through a consulting expert. Having said that the following also in effect addresses most if not all of the ecological matters raised by Te Runanga o Toa Rangatira, The Wellington Conservation Board, Friends of Taupo Swamp, and the PCC planning report.

To summarise, no comment that I have responded to materially changes my assessment of the values present on the Project site nor the level of effects. None of the comments I have responded to change the fact that the current land use's effects on water quality, wetland quality, stream quality (as habitat), and absence of terrestrial ecological value, are improved by the Project compared to retention of the current land use practices. The Project improves aquatic habitat, wetland condition and terrestrial ecology, and without the Project that betterment will not occur under the current land use practices.

The following sequentially considers the GWRC comments on wetlands and streams, PCC commentary on terrestrial ecology and then the DOC comments in regard to fish passage, aquatic ecology and terrestrial ecology.

Response to GWRC comments

Appendix 5 – Wetland Ecology (FTAA-2603-1181) – 6 July 2026 – Ms Melanie Dixon

Ms Dixon lists the matters in contention (as well as in agreement). This memo focuses on responses to the matters in contention.

The main issues appear to be how much natural inland wetland is present, the values of those features that are natural inland wetland, the quantum of remedy and offset proposed and how effectively the remediation and offset will function.

Amount of Natural Inland Wetland (paragraphs 5-6)

The first issue raised by Ms Dixon relates to the determination of a natural inland wetland (paragraph 5). DOC also raise the same concern (paragraphs 21-23 of Dr Kathryn Collins' statement of advice (Appendix C to the s53 comments)).

It appears that Ms Dixon is referencing the MfE document "Pasture-Exclusion assessment methodology" when she proposes the pasture exclusion in the NPS-FM definition of a "natural inland wetland" (item (e)) does not apply unless the area is proposed to continue being used as grazed pasture rather than the conversion to urban development. That MfE method document is not in the NPS-FM, it is specifically guidance for undertaking wetland delineation of wetlands in pasture settings.

Ms Dixon's view that the pasture exclusion is only for the maintenance of pasture is too narrow and not consistent with the NPS-FM itself. The NPS-FM definition of "natural inland wetland" (clause 3.21) specifies that where the RMA definition for wetland is met but the wetland "is within an area of pasture used for grazing" and dominated by pasture species then the area is NOT a natural inland wetland. Then the NPS-FM clauses relating to "natural inland wetlands" do not apply to such areas (e.g. clause 3.22). The NPS-FM does not say that the exception only applies to areas that are maintained for grazing and where grazing continues to be the activity (noting golf courses and parks do not get the same exclusion).

In the absence of the area continuing to be pasture (but still farmed) it does not fall back to being a natural inland wetland. The farmer might undertake to plant it out in a pine plantation, or maize, or turnips, rather than continue grazing and that does not then mean it is a natural inland wetland because the use of that land is being changed. Put simply, in my view the NPS-FM is about managing effects on wetlands, and wetlands are defined for that purpose. Nowhere in the NPS-FM does it say that whether an area qualifies as natural inland wetland or not depends on the eventual use of that land – instead there are different pathways for different kinds of activities affecting natural inland wetlands.

Consequently, the areas I assessed as meeting the pasture exclusion -i.e. they are pasture, should not, because of the land use change in the future, then be counted as natural inland wetland and added to the area requiring effects management. To do so would be inconsistent with the definition of "natural inland wetland" in the NPS-FM.

I have not come across the approach suggested by Ms Dixon in practice before.

The areas of natural inland wetland that I have mapped continue to be as reported and are as accurate as possible in the dynamic systems they are.

Ms Dixon at paragraph 8 retabulates the extent of wetland reclaimed. This is incorrect as it adds 5020m^2 of pasture to the total (which I excluded). In my opinion, the quanta of "natural inland wetland" remains as per Table 4 of my Ecological Assessment (Appendix 15 to the Substantive Application), being 22,211m^2.

On a similar issue, DOC have asked to clarify which wetlands qualify for the pastoral exclusion criteria. Figure 20 of my Ecological Assessment maps the wetlands that have been excluded because they are pasture.

Values (paragraphs7-13)

Ms Dixon at paragraph 9 disagrees with my Ecological Assessment's (Appendix 15 to the Substantive Application), (section 4.2) value allocation. I note that Ms Dixon has not undertaken specific detailed wetland assessments using vegetation plots or determining the species present and their coverage and the hydrology and condition of each feature, as has been done in preparing my Ecological Assessment but has still undertaken her own values assessment.

Ms Dixon refers to table one of Attachment one in her report. In table one of Attachment one she uses an aggregated view of the west draining features as a whole and finds that the infrequent scattered occasional natives present across all the features derive a medium representativeness. However, in reality every feature present is dominated by exotic species and is heavily affected by stock. It is my view that the occasional presence of a few common wetland native species found in farmland situations does not make a feature representative of an indigenous wetland.

Furthermore, rural exotic wetlands are not rare (Ms Dixon concludes they have high rarity). They are very common. Indigenous representative wetlands are rare, but grazed stock pugged gullies and wet soils with a dominance of exotic wet species and pasture are very common in the Ecological District and region. The word "wetland" (in the ordinary sense of the term, as distinct from the specific meaning of "natural inland wetland as defined in the NPS-FM) should not be conflated to mean indigenous representative wetland.

Lastly Ms Dixon's assessment of the ecological context concludes that the features are part of a network that maintains water quality to the Taupo swamp. I disagree. While the west draining systems are part of the drainage network, currently due to the land use (farming) and the absence of protection from stock throughout

the gullies, means that these areas are better described as conduits of farm run off to the Taupo Swamp (sediments, faecal matter, E. coli, nutrients).

In my opinion, low value is as high as the western wetland should be afforded (Ms Dixon assigns it moderate value).

I note that in all cases rarity is described as "high" by Ms Dixon (in table one of attachment one) and this drives much of Ms Dixon's conclusions. However, as I note above farm use derived exotic wet areas are common in the current landscape, while it is native dominated representative wetlands that are rare. Also, in any case, the gullies on site were historically never wetlands but forest with stream channels as can be seen in the SNA just north where that forest cover is currently still present and the gully in that SNA is not wetland.

After considering Ms Dixon's comments, my view remains that the values assessed in my Ecological Assessment are correct and accurate.

With respect to the magnitude of the loss of these features Ms Dixon (at paragraph 12) considers the loss of these features on the property is a loss of discrete features that should not be aggregated and compared as a proportion to the similar habitat within the wider catchment. Instead she is of the view that the property features can be aggregated (all 62) and considered at the sub-catchment scale and within the broader context of the ecological district (i.e., the Wellington Ecological District). Dr Kathryn Collins raises similar concerns (paragraphs 43 – 47 of Appendix C to DOC's s53 comments). I cannot see the logic in their suggested approach to compare the aggregation of features to a larger frame (the ED) rather than the local extent of wetlands.

The magnitude reflects the amount of a resource present at a spatial scale (area of habitat, population of a species) that is lost – removed, temporarily or permanently. The scale of that assessment drives the outcome.

Where a site (which is just an arbitrary planning boundary) has features common in the catchment or ED then one should reflect on the proportion lost and consider the impact to the resource. It is usual to use numeric comparison, hectares, population numbers etc. I compared the extent of wetlands on the property reclaimed to the amount that is in the catchment (acknowledging that that resource total was an underestimate because all areas have not been surveyed). At 1.6% of the natural inland wetland resource present in the Taupo catchment, I consider that as a low magnitude and can see no logic or reason for Ms Dixon proclaiming a high magnitude of effect at an even wider assessment scale (the ED, of which the Taupo catchment is just one part), noting these wetlands are not key elements and 1.6% is not a major loss.

The necessity of wetland offsetting (paragraphs 14-16)

Ms Dixon, because of the disagreement in value and magnitude, disagrees with my conclusion that there is no need to offer any offsetting, although this has been offered anyway. If the level of effects outcome had a strong bearing on the effects management, I would state that because effects are less than minor no effects management is warranted. Instead, because of the directive of the NPS-FM not to lose extent and value (clause 3.22), I recommended and derived an effects management package using the effects management hierarchy in the NPS-FM.

Wetland remedy (paragraphs 17-32)

At paragraph 19 Ms Dixon states that in her opinion the 12000m^2 extent of retention wetlands, being the area under the 10% AEP flood extent (which I presume to have saturated soils and permeant water sufficient to develop wetlands) is a significant overstatement.

I disagree that this is a significant overstatement, noting all measures by map are estimates and that the real ground area of saturated soils is likely to be larger again.

At paragraph 20, Ms Dixon claims the retention wetlands might be too deep citing Mr Blyth's assessment of cross sections indicating 0.5-1m depth is some areas. While I had anticipated most of the open water to be typically 200-300mm, raupo grows very well in depths up to 1.5m and a 0.5-1m area will simply be the raupo and kuta (*Eleocharis spathulate*) expansion area with other reeds and sedges in the shallower parts -noting raupo

is likely to be prominent in these areas too. Raupo and kuta can be seen growing in such deep conditions in refurbished NZTA Sediment retention ponds as part of the Mackays to Pekapeka Project and along the roadside of the Pekapeka and Otaki motorway. So long as the depth is under 1.5m, there can and will be vegetated cover. This is even before considering the use of submerged macrophyte in deeper waters, such as was added to the Pegasus Bay (north Christchurch) wetland development.

I note that in the Envelope Response to GWRC's section 53 comments on this issue, the wetland design has been revised to better flatten the wetland bottoms and so these deeper areas will not now occur.

In my opinion, the concerns raised by Ms Dixon of a lack of a sizable, natural, indigenous wetland development are unfounded. This is exactly the type of situation and opportunity to develop large native representative wetlands of multiple hydrological condition response, i.e. diversity and wetlands which are also screened from future urban stormwater quality issues and offer significant gains related to persistence of the farmed condition.

Ms Dixon also raises concerns in relation to stagnant water, raised temperature issues, dissolved oxygen issues, excessive waterfowl, leading to bacterial loading at paragraphs 23 – 25. These are common issues, but they are associated with shallow, non-vegetated ponds and created waterbodies with no flow through. The presence of a near fully vegetated wetland (such as will be the case here) prevents large numbers of waterfowl, moderates temperature and dissolved oxygen, noting that the system only discharges to the lower Taupo swamp under high flows when these issues are also mitigated. Ms Dixon does, however, seem to agree that a near fully vegetated wetland is preferable (paragraph 24) when she references Auckland Council changing open ponds to >80% vegetated wetlands to mitigate those effects. The issues Ms Dixon raises apply to almost all created wetlands. The fully vegetated state is important for a number of reasons, and it is the state that mitigates all of her concerns.

Ms Dixon (at paragraph 26) also considers that not all the area mapped as within the 10% AEP flood event will be wet enough "to provide the wetland conditions". However, while the10% AEP flood event is an infrequent event, the retention wetlands are in wetland gullies, and the entire current floor is sufficiently wet now and will remain so into the future. The 10% AEP flood extent area is elongated at the upper end of the retention area and will still have the gullies draining waters and still be wet as it is today (it is not dry now). Thus, regardless of the frequency of inundation, the base condition is and will be wet soils.

Ms Dixon's comments at paragraph 27 that the land between the area which is expected to flood regularly and the 10% AEP flood event area will not provide wetland conditions. While there may be some differentiation of wetness of soils at the edges (where those edges are part of the steeper side slopes) of the retention wetland in the 10% AEP areas, as indicated by Ms Dixon, FAC (facultative) wetland plants can be used in these areas which are adapted to drier soils. These FAC wetland plants, under the NPS-FM MfE delineation process, still qualify an area as natural inland wetland, flax for example.

At paragraph 28, Ms Dixon appears to be concerned over that manging sediment accumulation in the wetlands (undertaken by Council in say 10 years or some other entity at some other time) might reduce the effective ecological area. Sediment accumulation occurs in all wetlands that do not openly flush. As they accumulate sediments cause different plant communities to form and the wetland becomes a mosaic of types. The sediment accumulation prediction, given the retirement from stock use and gully revegetation at large, means accumulation will only reduce the effective ecological area after many decades. There is ample "open" water areas in the design to allow many decades of accumulation before the open wetlands would become soft mud wetlands, but eventually all constrained wetlands become wetland forests with drainage channels. This process does not retract from the values attained through the remedy and offset, especially when considering the future of these features under the current land use.

In relation to paragraphs 30 and 31, I disagree both with the reductions in area of remedy and offset wetland suggested by Ms Dixon for the reasons she suggests and that there will be areas of access that diminish the extent and condition of the remedy and offset wetlands. I expect the EHMP condition will require that EHMP set out the areas I have assessed and that quanta cannot be reduced by maintenance and other potential requirements.

Loss of extent (paragraphs 33-40).

Ms Dixon correctly notes that the ”offset” is enhancement of existing wetland. To create new wetland there must be wetland hydrology and appropriate substrate. Given the hilly nature of the property there are no lowland fully pastural (non-wetland) areas that have wetland hydrology and soil and could be created as wetland. There are no opportunities to make by digging or damming new wetlands.

As Ms Dixon notes (paragraph 35) the proposed wetland restoration does not address a loss of *extent* (instead it will enhance *value*). I agree and cannot see a way on the property given its topography to do so. Ms Dixon suggests that the areas south of retention wetland A are flat and suitable and the area south of Wetland retention E (east Kakaho catchment) – However, that area south of retention wetland A is already allocated to be enhanced wetland (see below purple areas).

Figure 26. One of the areas for the offset wetland creation / enh

Similarly, the area down stream of retention wetland E (lower kakaho east catchment) is already dedicated to a 20m wide riparian restoration and, in its lower portions, is already wetland, though again mostly dominated by exotic species . As a result, it is not an area currently not wetland that could be made to wetland.

In relation to the design of the offsets, I consider that greatly enhancing the values, condition, representativeness and resilience of the current low value, poor quality, without future potential wetland features, is in keeping with the effects management goals and that the extent of such enhancement proposed (1ha) is sufficient on top of the remedial actions, to result in a significant wetland ecology gain otherwise unattainable on this site under the current land uses.

Therefore, it is a trade of quantity for quality. However, I argue that retention of the total area of today’s wetland extent given it is low quality and lack of likely future gain under the current land use would have little purpose, meaning or functional value, and the exchange remains ecologically beneficial (positive).

The lack of response to project staging (paragraphs 41-44.)

Ms Dixon notes that the development is proposed over 10-15 years, and that there is no certainty of when which wetlands will be affected and remedied and offset. In my assessment I assumed that the retention wetlands would be constructed prior to any site earthworks, and that the beginnings of the offset wetlands restoration / rehabilitation would occur at the start of the works to infill the rest of the site in each catchment. I expect this would be covered by the EHMP condition. This means that the offset revegetation would occur during or before the reclamation in any one catchment. The retention (remedial) wetlands would be revegetated when the last of the bulk earthworks was finished in each catchment. I had assumed the earthworks for each catchment would take no longer than 1 year.

That would mean the remedial wetland actions would only be perhaps a year after loss. A year, given the poor quality and exotic nature of those wetlands is not at all significant. This is why I considered there to be no lag time, but also because of the simple, poor quality, exotic condition of the wetland affected which is not a loss of

indigenous biodiversity or important wetland functions. Given that, a year or even two is not in any way ecologically significant.

At paragraph 43 Ms Dixon reflects that there is a risk that all of the wetland offsetting is not completed because not all of the stages of the development are undertaken. I fail to see the issue where a lack of undertaking a stage means that an area of wetland is also not reclaimed. I suggest that this risk can be simply addressed by way of an accounting system that when the development removes any of the identified natural inland wetlands it must at the same time, regardless of continued stage development, account for the remedial and offset requirements commensurate with the loss. This is similar to Ms Dixon's suggestion at paragraph 44 for clear stage development stage remedy and offset plan. This could come in the plan suggested to be developed below.

Eco-Hydrological management, offset and monitoring plan (paragraphs 45-49)

Ms Dixon (and Dr Taylor, and Mr Blyth, and DOC) are agreed that a holistic eco-hydrological management, offsetting and monitoring plan as a condition of consent be required. They outline the features of that plan (paras 45-49). I am not opposed to such a plan being developed (as required by a consent condition) with an appropriately focused Council certification process.

Appendix 4 – Stream Ecology (FTAA-2603-1181) – 01 July 2026- Dr Gareth Taylor

Dr Taylor's technical commentary appears in essence to be about the determination of the offset for stream effects related to the SH59 roundabout culvert requirement, water and habitat quality effects of the proposal downstream (discharges), a need for a clearer pre and post-development aquatic habitat outcome on the property and insufficient fish survey efforts, and lastly the effects assessment is undertaken on the basis of a finished development rather than a staged development.

I address the points of contention in turn below.

Water Quality – Land use change and retention wetlands (paragraphs 2-8)

In paragraph 2, Dr Taylor agrees with me that the creation of wetlands and the wider land stabilisation will reduce sedimentation but considers that the ecological assessment does not address the changing water quality parameters.

My Ecological Assessment does not delve into water chemistry and what I consider to be essentially stormwater and hydrology aspects. But the Ecology Assessment does note that the changes brought about by the proposed land use change, setbacks, no stock in the waterways, riparian and wetland vegetation and creation will benefit on site and downstream aquatic systems. Dr Taylor is perhaps correct (at paragraph 5) that more could have been stated about the current farm-resultant poor quality waters discharged to Taupo stream and swamp from this farm due to stock access to all of the gullies and ephemeral and intermittent systems. There will also be a change in the nature of effects because of the development between greatly reduced sediments, nutrients, bacterial load (*E. coli*), urea, faecal coliforms (from farming) and instead urban based contaminants such as zinc, lead, copper, oils, surfactants.

Unlike the farming practices, the urban development comes with a series of treatments of stormwater (materials control, rain gardens) such that stormwater entering the new wetlands, fully vegetated, will be cleaned of 70-90% of those contaminants. In addition, the wetlands, while absolutely not part of the treatment system, will inevitably capture all or most of the residual contaminants such that the downstream habitats of Taupo Stream and swamp will be substantively benefited by this land use change and the required controls.

Furthermore, because the Taupo Stream downstream of the site is mostly riparian vegetated, the course and dissolved (COM and DOM) organic matter caused by the native canopy and edge foliage in the stream (as well as the high sediment load) will bind and bury most heavy metal contaminants (Keesing 2025)[1].

While this may not be explicitly laid out in the ecological assessment it nevertheless is a positive ecological outcome of the project – to remove the existing polluting activities and place better managements of the future land uses water contaminates.

In paragraph 3 Dr Taylor raises uncertainty in regard to the nature of the future retention wetlands as my remedy for the loss of the poor quality narrow, pugged, shallow, turbid stream areas converted to the retention wetlands. It seems that the issue is that the retention wetlands might require some maintenance, particularly in regard to sediment accumulation. I addressed a similar issue above in relation to Ms Dixon's comments. I repeat that I see no requirement for management of what will be representative natural indigenous wetlands, post creation. They will be much superior aquatic habitat to that which is currently present, and much larger (more habitat). I do not consider that they require maintenance in regard to sediment accumulation. I consider no considerations should be made for machine access to the wetlands edge or centre and that no sediment removal from the system should occur. But if the Expert Panel considers appropriate, a condition could be included which allows for a de-sedimentation event to occur in response to events that create an abnormal amount of sediment. Such an action would be a minor temporary disturbance (set back) to the developed retention wetlands which would recover rapidly. I cannot see the issue either way.

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[1] Keesing, H. 2025 The Capacity of dissolved organic matter from native NZ vegetation to bind dissolved copper and zinc. MSC thesis Canterbury University, School of Biological Sciences.

At paragraph 5, Dr Taylor agrees with me that the retention wetlands provide more aquatic habitat than is lost on the property (despite later queries on the length of stream affected on site). He says however, that the quality of the habitat of retention wetlands has not been considered. I suggest it has.

To reiterate, the current largely intermittent and perennial systems on the property are highly impacted narrow, shallow waterways with considerable stock pugging, sedimentation, no riparian vegetation offering cover. These systems have sediments, stock faecal matter and urine loading and have not indicated fish species richness or abundance (eDNA). The systems macroinvertebrate communities likely also reflect those aspects of soft sediment substrate, macrophyte and dirty water, not clean water gravel and cobble substrates under a native canopy (section 3.4.1 of the AEE). The only stream of some value is the Kakaho west main branch, but its banks remain pugged and eroding, stock faecal matter and urea remain delivered without buffer, the sediment levels in the bed remain very high, there is no riparian cover or buffer, and the stream is still narrow and shallow. But it is the larger waterway on the property and does contain some pool and riffle habitat and has better macroinvertebrate community potential some better substrate areas. There are short and long fin eel, banded kokopu, koaro and red fin bully present.

All these elements were recognised in my Ecological Assessment. The wider larger retention wetlands permeant waterways, which are fully vegetated, will have cleaner substrates (and will require some additional sedimentation), offer better temperature regulation, have better (more stable) dissolved oxygen patterns, with spatially more habitat, and they will receive cleaner waters from the catchments because of the various improvements and reductions in current habitat detractors (stock etc). The quality will, at the very least, be the same, but I predict because of the enhancements they will be much better for those species present.

Dr Taylor then (paragraph 6) warns of downstream water quality potential effects and change to the hydrology regime. I have addressed already the water quality downstream issues which in a nutshell will be beneficial because of the removal of the current land use pollutants and future management of the potential urban ones. Dr Taylor reflects on the water quality of ponds, but as I have expressed earlier the retention wetlands are not stagnant ponds, they are fully vegetated wetlands which do not have those same issues of open shallow water ponds.

Dr Taylor (paragraph 7) seems most concerned about wetland D because it sits high in the catchment. Wetland D is not a stream habitat; it is a deep mud Isolepis-Juncus pasture wetland (wetland 60) headwater. Wetland D, where it is 1.4m deep, will have raupo establishment issues (that is just within its upper depth range) but this wetland is not a stream remedial area. I note that the discharge is north into the Muri block and through a pine forested gully down (Ca. 200m) to the SNA, not directly into the SNA.

At paragraph 8, Dr Taylor states that where consent is granted that conditions should require that the wetlands perform within expected parameters and I agree. There needs to be a process to assess if the retention wetlands have succeeded both in terms of wetland development and condition but also as freshwater habitat, including macroinvertebrate fauna. The parameters would be set out in the hydro-ecological plan raised by Ms Dixon which I also agree should be included.

Stream Ecological Valuation Method (paragraphs 9-13)

At paragraph 10, Dr Taylor reflects on the absence of a formal SEV measure (i.e. a modelled one, not a data collected informed model) in the AEE and that that is not, in his opinion, appropriate. He later acknowledges the additional work to undertake a data informed SEV model for the Taupo Stream tributary. Nevertheless, he still has issues with that process, citing a lack of a date of the data collection day, antecedent conditions and that the methods of survey are vague. I note for clarity that the memo I sent re the measures and re calculation of the SEV (Memo 02 June 2026) did have the date of the survey and detail of what I had measured. I assume the second memo re the SEV modelling for the Kakaho west main stem (sent to GWRC by the Applicant) did also have a date. With regards to Dr Taylor's concerns about the vagueness of the survey (paragraph 11), the methods are prescribed by the model and the metrics to be measured on site are clear.

At paragraph 12, Dr Taylor reflects that he is unsure if the assessment of value and effect was via the EIANZ guidance process. I note that the guidance is referenced in my assessment in several places. Dr Taylor is correct

in that I did not have the usual section in the methods stepping out the EIANZ process for values and effects assessment. Nevertheless, I can confirm it is the process that I used.

In regard to paragraph 13, where Dr Taylor asks me to provide details of fish data study methods, the fish data comes from NIWA survey data, eDNA and spot lighting on the western tributaries and from a Boffa Miskell report in the lower Kakaho catchment, from PCC plan change information (which was habitat assessment driven), 2 NIWA reported surveys and then from a more recent night spot survey in the Kakaho west main stem. In my view, there is sufficient fish species presence data for the purposes of the assessment.

Stream assessment and Mitigation – Taupo Stream (paragraphs 14-30)

At paragraph 15, Dr Taylor notes the revised (by me) Taupo stream SEV (in Appendix E to the documents provided to the Expert Panel on 4 June 2026 (page 3)). That lower SEV is a result of collecting and using actual stream data, not the presumed condition initially undertaken as part of my Ecological Assessment (0.51 instead of 0.60). He also accepts that I am qualified and experienced in those measures and modelling.

However, Dr Taylor has four concerns which he says may impact on the reliability of the SEV. The first concern is that there has been no fishing to confirm no fish are present (affecting the IBI score and contributing in a very minor way to the averaged SEV score).

Dr Taylor is correct I have not fished or taken an eDNA sample to survey for fish in the upper eastern tributary. That is because of the very significant perched culvert blockage under the walking track. The tributary has been significantly impacted in the early years of colonisation (1860-1930s) with the current Taupo swamp initially a flax plantation and mill site. The upper arms were affected by this industry.

In 1942 it can be seen that the stream and its surrounds were modified.

Figure 1. Retrolesn 1942 aerial of the SNA, the tributary of retention wetland B and the across road Taupo tributaries.

From aerials it appears that the public track was installed around 2000. At that time fish passage was blocked (fully given the perch and height above the downstream bed). 25 years of no recruitment of young fish will mean no eel or other diadromous fish species are likely to be present. The stream itself is not large or deep and does not have many pools. It does not contain good stable fish habitat.

Dr Taylor's second concern is that no macroinvertebrate surveys have been undertaken. Dr Taylor is correct that I have not sampled macroinvertebrates, but I used sample data I have collected from the Te Puka stream a little

north. This is a better but similar stream that is larger, more hard bottomed, and its macroinvertebrate fauna will be better and so there is a conservative set of metrics in the model.

Dr Taylor's third concern is an assumption that one of the model factors (Vriparian connectivity) is undervalued. I note Dr Taylor has not visited the site. As such, he may not appreciate that one side of the stream is mostly affected by the Highway berm and toe and there is much less native riparian vegetation, sometimes just a tree, down the eastern side of the stream.

Lastly Dr Taylor reflects on the SEVi-P saying it was not provided. SEVi-P is a hypothetical SEV condition where the stream is imagined to not have the detracting issues that it has, but has management that causes it to be better than it is if not pristine. However, I did explain my approach to the use of SEVi-P in the memos sent detailing the additional data and modelling, which is that the current state under the native restored vegetation in a park (managed by the Council) is as good as it can be. The road berm and run off, rubbish and limited riparian condition on the road side will not and cannot be further mitigated or imagined to be not present. The measured SEV that is current is also the SEVi-P, there is not reasonable better state that this stream can attain.

Consequently, in my opinion, the inputs of my modelled SEV (for Taupo tributary and Kakaho west main stem) from the data collection surveys are accurate.

Dr Taylor does appear (paragraph 16) to agree with my culvert value SEV.

At paragraph 17 Dr Taylor appears to reflect on the older SEV in the Assessment (which I still stand by) but is nevertheless now irrelevant given the updated measured SEV metrics (Minute 3 response).

Dr Taylor then (paragraph 18) states that the multiplier is incorrect. However, he appears to be referring to the old ECR calculation in my Ecological Assessment which is no longer relevant (noting that it is not incorrect but assumed different numbers in the calculation to the updated SEV). He then goes on (paragraph 19) to acknowledge the updated SEV process[2] He is correct when he notes the stream to be enhanced is 23m less than my Ecological Assessment.

Dr Taylor then states that the SEVi-P is, in his opinion, incorrect (paragraph 19); I disagree for the reasons I explained then and now also above. The SEVi-P is as measured because the setting is not an un-fenced, un-vegetated farm stream with realistic improvements from removal of site detractors, but an already vegetated, protected reserve, without stock and no further reasonable improvements likely (except perhaps Councils reworking of the fish passage barrier). For those reasons. Dr Taylor's opinion that the SEVi-P should be 0.65 is, in my opinion, purely speculative. Thus, in my opinion, there are no better scores or metrics to be used in the ECR calculations and without the 1.5 multiplier suggested by Dr Taylor the ratio of offset is 1:1.55.

Dr Taylor's last point is the application, or not, of the 1.5 multiplier which was placed in the formulae by him initially as an, in case of default, and later to account for a time lag to achieve the SEV target. I do not consider it is a required component of the offset calculation in all cases.

I explained my reasoning in Appendix E to the documents provided to the Expert Panel on 4 June 2026 (page 3). That is the 1.5 multiplier is not used "*because default of success would be a breach of conditions and there is no difficult site circumstance or conditions that makes removal of stock, fencing, native revegetation or installation of large woody debris difficult or at risk of success*". As to lag time: "*while the riparian vegetation to be planted will take between 5 and 10 years to provide shade and drop leaf litter and invertebrates directly into the stream, the fencing off and planting and weed management will change the erosion susceptibility of the banks, the woody inputs will have an immediate benefit, and the filtration of stormwater over the surface through vegetation will function from the time of the fencing. In short, while the shade component will take approximately 7-10 years, most of the other functions and gains of riparian edge treatment occur sufficiently quickly that a true lag time for in-stream habitat gains of the SEV are not sufficient to warrant (in my opinion) such a multiplier*."

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[2] Minute 3 response, revised SEV computation: (0.51-0.2) / (0.6-0.4) = 1.55 -i.e. an ECR of 1m lost stream to 1.55m stream improvement – noting both streams are circa average 1.5m in width).

I remain of that opinion and that the 1:1.55 ratio is a fair offset relative to the stream extent and condition being offset.

Dr Taylor's apparent concerns (paragraph 24) about an up-stream wetland being created and about a land use change from non-controlled farming pollution, to controlled urban stormwater input is not a factor reducing the ability of the stream to recover after the offset treatment.

Dr Taylor (paragraph 25) notes that "the application in its current form does not provide project staging at a level that allows lag to be fully determined". With regards to the Taupo Stream roundabout and culverting, I recommend that the stream offset should be begin in Stage 1 regardless of when the effect will actually occur, and this approach should be reflected in the EHMP condition. This means that the offset is well advanced by the time of the effect, or if the effect does not occur then there is an advanced stream betterment because of this proposed land use change. This fits I believe with Dr Taylor's suggestion to the Panel in paragraph 26. It also means that the ratio I calculate is the fairer one compared to Dr Taylor, particularly given actions to offset are taken well ahead of the eventuality of adverse effects.

Stream Assessment and Mitigation Watercourses with the site (paragraphs 31-36)

At paragraph 32, Dr Taylor suggests that there is more on site stream affected than the 450m relayed to me by the site engineers and their GIS measures. He says that additions of stream from under retention wetland bunds and road culverts means the linear extent of stream affected is 745m. However, he still agrees with me that the retention wetlands supply more aquatic habitat than is lost.

Dr Taylor includes road culverts in his calculation of the affected stream, but it is my understanding that most of these are replacements of existing culverts with possible minor extensions. Where new culverts are proposed, Dr Taylor already agrees with me on their habitat value after installation (0.2 SEV) (paragraph 22). The additional extent of habitat loss in these poor quality small tributaries is, in my opinion, negligible and does not require additional offset on top of the wider mitigations of the wetlands.

Despite that, I have asked the project engineers to reconsider their measures for the onsite effects to streams inclusive of culverts and bunds (noting Taupo stream in SNA is considered separately). The calculations of total stream affected, including culverts and bunds, are provided below.

Total stream affected in Taupo catchment:

Wetland A = 0m (Ephemeral stream starts at the outlet from this wetland)
Wetland B = 51m under bund + 72m (perennial) and 15m (ephemeral) = total 138m (note, existing culvert under bund will be removed and replaced so this is not counted as stream reclamation.
Wetland C = 42m under bund + 48m + 35m (E) = total 125m

Total affected in Kakaho:

Wetland E = 25m under bund + 140m (P) in wetland = total 165m (note some of existing stream is already culverted under bund, we are replacing that culvert).
Culvert P38 = 50m

This makes a total of 478m (which equates to around 150m^2 of aquatic habitat area (average stream width 0.3m)). This is near enough to the original measure of 450m as to make no difference given the areas of gained habitat continue to outweigh the area affected.

Dr Taylor (paragraphs 34(a), and (c)) goes on to reflect that the site stream effects did not go through the SEV process, and that there is no direct offsetting proposed for stream loss. That is true, the SEV method is a process for offset calculation - the offset part of the effects management hierarchy. Because I determined that the

effects not avoided have been mitigated through remedial actions, and that there is no significant residual effect (indeed there is a gain) there is no need to provide an offset as part of the effects management hierarchy process (more, better habitat is returned than is lost in the remedial actions) and so there is no requirement to show a transparent offset calculation process, i.e. the SEV method, because there is no offset.

Dr Taylor (paragraphs 34(b), and 35) correctly notes that my assessment is related to the full development and does not consider staging as that relates to the effects management and the timings of actions to remedy and offset effects. As he suggests, and has been discussed already, I have no objection to there being an effects management-ecology-hydrology overarching plan, noting I already assumed the stream offset for Taupo stream would occur in stages. Having an overarching plan detail timing of effects and actions to manage those effects and the monitoring is sensible and could be required by a consent condition.

Fish survey data (paragraphs 37-41)

In his section on fish survey data Dr Taylor reflects on the older data and not on the new data relevant to the Kakaho west main stem (the recent response to GWRC reflecting the night spot data showing the presence of eel, and two galaxiid and a bully) and suggests the fish data is "very light". Given the size, amount of water and condition of the waterways in question and the type and extent of interaction and loss I consider that the data used was more than adequate to assign value and determine a level of effect (noting the data in regard to the Kakaho main west stem was added too). I had assumed that there were nevertheless fish to cater for (see below DOC responses re fish passage). I did not, through absence of more detailed and frequent survey discard the presence of fish. More surveys would not have caused any different response, fish still need to be salvaged and passage provided as required and habitat remedied.

Dr Taylor suggests (#41) a set of conditions to address his concerns in this matter, being more surveys in all culverted streams. I do not think that that will assist, passage is already being considered for eel, red fin bully and band kokopu. Nevertheless, if the panel consider more fish presence data is necessary then I am not opposed to such conditions where moderated to be appropriate to the stream and culvert involved.

However, and as will be discussed shortly, the current draft fish salvage plan is already fit for purpose.

Taupo Stream culvert permitted baseline requirements for fish passage (paragraphs 43-46).

Dr Taylor notes that the Taupo tributary culvert under regulation 70(2)(a) of the NES-F requires the same passage as exists now - and he is correct. My opinion in the assessment is that without the Council fixing the downstream total barrier culvert under the foot track, fish passage in the new culvert would be moot. But that said the new culvert would be a low gradient relatively simple design challenge that should easily be able to meet the fish passage requirements of the NES to a permitted condition – i.e. supply fish passage if that becomes relevant in the future (if the Council fix the down-stream barrier). Hence, I agree with Dr Taylor's (at paragraph 46) recommendation to include a condition requiring fish passage for the Taupo stream culvert. I also consider that such a condition is required for fish access to retention wetland B and E or indeed any part of the west Kakaho main stem). But as discussed below under the DOC commentary in response to Dr Collins I do not consider any other culvert (that I am aware of) requires passage within the project area.

Fish Passage – Retention wetlands (paragraphs 47-48)

Dr Taylor suggests there are some risks to the performance of fish passage into some of the retention wetlands. I discuss this in detail in my response to the DOC commentary (Response to Dr Collins in relation to wetlands A, C and D) below. But in essence fish passage requires flow and flow cannot be provided all year round from all of the retention wetlands and still have a permanent wet habitat within these wetlands. The project hydrologist, however, predicts there will typically be flows in the retention wetland culverts in most months other than extreme dry summer. Given upward fish passage is typically August-December here and downstream travel after April there should be no issue with a lack of flow/ fish passage during summer intermittency.

Fish salvage plan (paragraphs 49-50).

Dr Taylor lists out a number of aspects not currently in the draft fish salvage plan. Some of the aspects raised by Dr Taylor are unnecessary such as points a, and b. In response to point a, a salvage plan does not need to list out or determine what species are salvaged or if they are chance finds, it just directs the process to rescue all fish (and koura) and safely establish them elsewhere. I have undertaken many hundreds of hours of fish salvage over the last 10 years and the one thing that typically gets in the way of a good process is an overly prescriptive plan which does not allow the expert to adapt on site as things arise. In response to points a, b and c, to manage effects a fish salvage plan does not need to state how fish are to be captured or what to do if an unexpected species occurs. In response to point d, the fish salvage plan does not need to measure each fish's size to manage effects, it only needs to count the number of each species salvaged at each attempt and ensure they are safely managed and released.

In response to points e and f, an MPI permit is always required for private property fish capture and transfer, but DOC permits are not required for same stream release. It is assumed that the salvage process being undertaken by a suitable qualified and experienced person will have the appropriate MPI permits.

In my opinion, the draft fish salvage plan provides certainty of the important aspects and good guidance but offers enough leeway to not obstruct adaptive responses on site by the expert.

Eco Hydrological Management, Offset and monitoring (#51-52).

This is a repeated call by Dr Taylor (and also DOC) for an integrated management plan to be required by a consent condition - which I agree with.

Response to PCC comments – Terrestrial Ecology (Dr Nyree Fea)

The questions and comments raised in PCC's terrestrial ecology report are also partly addressed in my memorandum to PCC dated 08.06.2026.

Dr Fea is concerned that mapping of all habitat types at the site has not been undertaken and suggests that a figure be provided in the Ecology report that maps the vegetation and habitat types across the entire development.

As noted in the earlier correspondence with PCC (dated 08.06.2026), the Mt Welcome ecology report illustrates features of ecological importance in Figure 5, Figure 6 and site photographs. A map of every vegetation type (including shelterbelts and pastures) was not produced because there are no indigenous vegetation assemblages remaining on the farmed land other than the 0.5ha of planted indigenous shrubland (acknowledging the 0.3ha initial area reported in page 7 of the Appendix 15 of the substantive application). I do not consider the gardens in three house lots to be valid indigenous ecological features, although consider that the lizard expert may. I consider that a map of all vegetation types does not materially assist the understanding or assessment of ecological values, indigenous fauna habitat, or the associated effects and management of such effects.

As earlier noted, I remain of the opinion that there is no indigenous scrubland or paddocks of rank pasture, but there are variations in pasture length depending on the stock rotation in paddocks. There are also areas of vegetation along driveway edges, boundary edges and in other locations identified by Mr Tony Payne (largely exotic plant species). The lizard expert has described and mapped these features in relation to lizard habitat potential in his report (Appendix 16 to the substantive application). However, these areas do not comprise indigenous vegetation requiring mapping in the terrestrial vegetation community report. In my view, the important communities have been appropriately identified and mapped.

Dr Fea considers that the SH59 road edge natives (which are growing under the pine forest and with extensive weed species) should be included in offset calculations where it is cleared for the Project. Dr Fea considers that where clearance is associated with pine harvest an offset would not necessarily need to be considered, but offsetting should be considered here because the clearance is for development. I disagree with Dr Fea, and consider that the vegetation is not significant regardless of the purpose for its clearance. Further, the vegetation holds no important species or area of habitat, has no important functional role, is not "natural", and is being cleared for roading purposes (something NZTA might chose to do) which, while related to the development, is not for the development.

Figure 6 of Appendix 15 of the substantive application identifies the areas of the site that are not pasture where some value remains, mostly associated with hydrology within the property. On Figure 2 below I add the planted shrubland (orange outline) and the off property pine area under which there are native plants (red).

Figure 2: Map of the features in the key below.

Orange area = the planted shrubland (0.5ha), including non Wellington species such as Karo.
Red = the under pine / road edge area of native and exotic shrub.
Various greens = wetland (with number), blue lines = perennial stream.

Delineating vegetation to be cleared

Dr Fea, while undertaking her own measures, agrees with my estimation of the area of native vegetation to be cleared, which is circa 1400m^2. However, Dr Fea then discusses the removal of 687m^2 of vegetation from SNA029 (on the east side of the main access track). Although I considered this area should not have been included in the SNA initially (because of its condition), it has been included in the SNA area and the ECR (3:1) is applied to the entire measured (and agreed) area of 1400m^2.

Loss of indigenous vegetation

Dr Fea and I agree that the planted shrubland is not significant under the RPS Policy 23 criteria (or NPS-IB). However, Dr Fea considers that the loss of the planting is not negligible because of the land environment class it which it sits. The shrubland arguably (because the map is low resolution) sits on the boundary of the < 10% landform with cover of indigenous vegetation and the 20-30% remaining indigenous vegetation cover, and is arguably within this latter class.

In her report, Dr Fea considers that fragments of indigenous scrub provide important refuges and corridors for indigenous species. In my opinion, that assessment places insufficient weight on the presence of the large SNAs in the local environment and the characteristics of this fragment (namely its "all edge" small size and that it has been planted recently). I assessed this fragment as having virtually no ecological functional value and remain of this opinion.

While Dr Fea accepts this fragment is of low value, I am unable to understand the basis on which she concludes that its clearance would result in a moderate magnitude of effect. Even accepting their assessment, the resultant level of effect is low (minor or less).

I did not assess the removal of this shrubland as resulting in an ecological effect. Whether the shrubland will be removed as part of the development remains unknown. Further, I do not consider this relatively young planted area should be tested as a valued habitat or even as non-SNA indigenous vegetation or habitat of specified mobile species. Given its recent establishment, narrow width (<50m, all edge effected) and planted species composition (noting non-Wellington species), unless it was undertaken as a mitigation or offset for an activity, I remain of the opinion that the NPS-IB non SNA provisions do not apply to this planted feature.

Indigenous vegetation offsets

It is unclear to me why Dr Fea considers that the loss of 687m^2 of indigenous forest on the roadside edge of SNA029 was incorrectly characterised in my assessment. As stated above and in the ecology report (end of section 5.1) the 1400m^2 of indigenous vegetation included in my calculations and subsequently offset does not exclude the portion on SNA029.

As to the ECR, I consider, regardless of PCC opinion, that a 3:1 offset ratio is appropriate and proportionate to the age and condition of the affected vegetation/habitat.

Dr Fea suggests that the examples of use of 3:1 offset ratio provided are old and perhaps out of date but the offset model tools have not changed substantially.

One critical component of the offset model (BOAM) is the benchmark for area. The forested fragment of the KNE up stream of Taupō swamp in which this clearance occurs is 13ha. The KNE in total is some 57ha. The effect of 0.14ha (inclusive of 0.03 SNA029) as a loss to the biodiversity value score in the BOAM model is 0. Only when the benchmark for area is <3ha does this clearance result in a negative biodiversity outcome. In my view, this demonstrates that the impact in regard to the BOAM model is too small to materially influence the BOAM assessment. I do not consider that it is correct to put the benchmark area as only the area which is affected by the Project.

Other aspects can be used in the model, such as species richness, tree canopy number, height, density and ground cover, but the essence of loss is the area of vegetation. 1400m^2 of vegetation from a 13ha area is a small effect. Given the area is bisected by rail and footpaths, is relatively young and is compromised by weeds, the offset ratio of 3:1 is a fair propionate response and 7:1 or 10: 1 by area (as suggested by DOC and PCC) is not in my view.

The model outcome ultimately depends entirely on which variables and benchmarks are chosen. For example, using the 13ha benchmark, a 55-species benchmark, and a 60% current functional score gives the following:

	Biodiversity Component	Biodiversity Attribute		Measurement Unit	Area of Impact (ha)	Benchmark	Measure prior to Impact	Measure after Impact	Biodiversity Value
0.1	BDLF	0.1a	Area	ha	0.14	13	0.14	0	0.00
		0.1b	species rich	count	0.14	55	30	0	-0.08
		0.1c	Function	%	0.14	100	60	10	-0.07

The 3:1 offset proposed returns a positive component net present biodiversity value, assuming 60 years to attain the cover,1 year for species richness, and 5 years for buffer and connectivity to reach 60% functioning.

Biodiversity Component	Biodiversity Attribute		Measurement Unit	Benchmark	Proposed Offset Actions	Offset area (ha)	Confidence in Offset Actions	Column K and Follow the instructions in Column L		Measure prior to Offset	Measure after Offset	Time till endpoint (years)	Biodiversity Value at Offset Site	Biodiversity Value at Impact Site	Attribute Net Present Biodiversity Value
BDLF	0.1a	Area	ha	13	reveg	0.42	Very confident >90%	Finite end point	Continue to Column M	0	0.42	60	0.00	0.00	0.00
	0.1b	species rich	count	55	reveg	0.42	Very confident >90%	Finite end point	Continue to Column M	0	20	1	0.11	-0.08	0.04
	0.1c	Function	%	100	buffer /connections	0.42	Confident 75-90%	Finite end point	Continue to Column M	0	60	5	0.06	-0.07	-0.01

However, the model can be run under a range of metrics and timeframes. Under this scenario, with a 13 ha benchmark, the area lost does not cause a negative biodiversity value score.

If I set the area benchmark to that which is cleared, then the outcome to attain a zero component net present

Biodiversity Component	Biodiversity Attribute		Measurement Unit	Area of Impact (ha)	Benchmark	Measure prior to Impact	Measure after Impact	Biodiversity Value
BDLF	0.1a	Area	ha	0.14	0.14	0.14	0	-0.14
	0.1b	species rich	count	0.14	55	30	0	-0.08
	0.1c	Function	%	0.14	100	60	10	-0.07

biodiversity value is 0.7ha, i.e. a 5:1 ratio.

Biodiversity Component	Biodiversity Attribute		Measurement Unit	Benchmark	Proposed Offset Actions	Offset area (ha)	Confidence in Offset Actions	Column K and Follow the instructions in Column L		Measure prior to Offset	Measure after Offset	Time till endpoint (years)	Biodiversity Value at Offset Site	Biodiversity Value at Impact Site	Attribute Net Present Biodiversity Value
BDLF	0.1a	Area	ha	0.14	reveg	0.7	Very confident >90%	Finite end point	Continue to Column M	0	1	60	0.00	-0.14	-0.14
	0.1b	species rich	count	55	reveg	0.7	Very confident >90%	Finite end point	Continue to Column M	0	20	1	0.19	-0.08	0.11
	0.1c	Function	%	100	buffer /connections	0.7	Confident 75-90%	Finite end point	Continue to Column M	0	60	5	0.09	-0.07	0.02

Dr Fea then reflects on habitat loss and gains for key faunal groups. However, the lizard losses and gains are addressed by the project herpetologist. I remain strongly of the opinion that bat presence is highly unlikely given the absence of records locally and the opinion of the bat expert involved in the PCC plan change assessment. Furthermore, the pine tree lots do not provide bat habitat. There are a number of tall, mature, tree native SNA's in the area and associated with water ways, which makes pasture surrounded macrocarpa trees and pine shelter belts the least preferable habitat locally. I also understand that the shelter belt pine and wood lots could be cleared as of right. Lastly, there are no native bird habitat issues or values lost on site, and management practices proposed minimise native bird loss through the SNA clearances. While the extension to the SNA through the offsetting is an advantage, it is not possible to cite gains for the fauna in any measurable way.

There is no cumulative habitat loss associated with this proposal. There is a substantive gain in the quality and area of wetland and aquatic freshwater habitat, which 20 years from now, will result in a larger and better connected SNA system.

Conclusion

Dr Fea suggests the Panel issue further information requests to further inform the ecological assessment. I relation to these requests:

- I do not consider that further information is necessary in relation to indigenous vegetation (items 1a -f).
- I do not consider that a bat survey and bat management is required.

- I agree with a need for native bird nest checks in SNA prior to SNA vegetation clearance if clearance is undertaken during the breeding season (August-February), and that nest relocation should not be undertaken.
- The lizard aspects I leave to the herpetologist – Mr Tony Payne.

I believe the 3:1 offset ratio is proportionate and fair relative to the age and condition of that which is lost. However, the BOAM model can be run to cause a 5:1 or greater ratio. If the condition of the area of SNA was to be ignored and the area accepted as a semi-mature indigenous forest requiring a 60 year time frame for replacement, then a 5:1 ratio would not be outside of other examples for semi-maturing broadleaf forest.

Mt Welcome fish passage: Response to DOC submissions (Dr Collins, 13 July)

DOC has raised issues with the project's inability to provide fish passage at three of the proposed new wetlands and a culvert (P-39). DOC does not accept my evidence regarding limited fish presence, the quality and amount of habitat in question that would be lost to fish access and that currently access is limited or nonexistent for those areas.

The project has agreed to provide fish passage in each retention wetland culvert that connects the wetlands to the downstream. However, I do note that such passage is going to be designed for climbing fish (those species recorded or most likely present) and is unlikely to provide passage in all seasons in all months. The project hydrologist, while stating flows are likely most months of the year, cannot confirm that dry summer months will have flows down the culverts. The culvert must, in the first instance, not drain the wetland. The important fish migration times on site are August to December for upward juveniles and April-June for downward adults. In the following I discuss why fish passage to most of the retention wetlands is not important.

In summary, there is no substantive habitat lost to fish by the development of the wetlands and that passage cannot be made and have the proposed wetlands at the same time.

This is further explained below in relation each specific wetland or culvert.

Southern Central Wetland (position of proposed wetland A)

At the position of proposed wetland A, the condition at the early summer surveys was a fully vegetated deep mud accumulated sponge with wet pasture arms and a very small catchment with no stream channel or flows unless under heavy rains. A winter 2026 view shows after several days of rain the area responds by loosely flooding over the entire feature but not in a defined channel.

The upper arms are mostly dominated by recognised pasture species even while there are clusters of Juncus and Isolepis (depending on stocking) and are considered ephemeral based on summer surveys, noting that after rains (in winter) there is a shallow narrow flow and that the gradient has produced a definable channel in many parts.

The large central area is a floating macrophyte mat of soft muds, held up by a culvert south that supports a track traversing the gully floor. This wide wetland, which is a saturated mud sponge and fully vegetated, was considered unsuitable as fish habitat except possibly short fin eel. A very weak eDNA signal was recorded from the below track culvert sample for short fin eel. However, access to the feature is very limited even for eel because of the various current passage blockages. We noted that the track culvert was perched.

I considered the fish habitat upstream of the basin wetland (proposed wetland A position) to be none (it may be seasonal foraging for short fin eel (if present all year round in the central wetland) after rains). As a result, The position of the proposed new wetland will be all of the upstream fish habitat potentially available and affected – being 85m long averaging 10m wide of fish habitat being changed - a very small amount of potential poor eel habitat of the wider Taupo swamp and stream.

There is little more, other than undertaking numerous more eDNA sampling and further night spotlighting (with its limitations), that can be done to prove the area does not contain a permeant fish population. It is possible that from time-to-time a, or some, short fin eel access the area, but it is not valuable habitat to the wider catchment or eel population.

The new proposed indigenous wetland that will replace this mud sponge wetland (Figure 2) requires a downstream bund to retain the limited water present and to create a standing water reed wetland (Raupo, Eleocharis, Machaerina - with sedgeland edges). The "pipe" joining the wetland and downstream is to facilitate flow discharge from the wetland but not drain it. Because the bund is designed to facilitate the maintenance of the reed wetland (at around 300-500m standing water) it cannot contain a continual flow down the pipe at all times in all seasons because the pipe is set high enough to not drain the wetland completely. This means fish passage cannot be always facilitated by the pipe, but it will provide fish passage during the important migration periods.

In short there is no reasonable habitat currently for fish populations and it is an area all of 85-90m long and 10m wide at most. The new wetland, while a good fish habitat cannot technically be created to have unassisted fish passage at all times (otherwise it could be drained entirely), but will have passage during important migration periods.

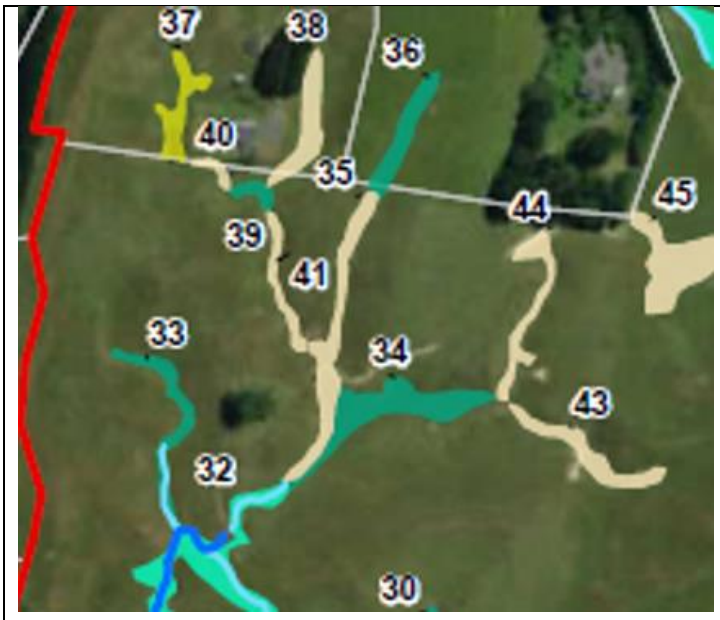


Figure 2 The mapped feature in the Assessment (Figure 6 feature 34).

Area 34 (Figure 2, Figure 3) a fully vegetated, no standing water, no channel, semi-pasture with spongy mud floating macrophyte natural inland wetland.

In summer (circle indicates winter photo area).

In winter after days of rain (29.07.2026), pooled water but no stream channel.

Figure 3 Overlooking the central wetland position of proposed wetland A, in summer and in winter after rain.

This generally is the story with the other features quested – wetland C and D and culvert P-39.

Northern potential wetland D

Potential wetland D is even less ambiguous as it is the upper sloped end of a gully in which the wetland is currently without standing water and is a *Juncus- Isolepis-pasture* dense mud sponge. It very clearly has no fish habitat, is very small and no fish habitat area above it requires passage.

Central proposed wetland C

This area is described in my Ecological Assessment (Appendix 15 to the Substantive Application) (section 3.3, figure 6, features 47, 48 and 54) as a hill gully with creeping bent, Juncus and Yorkshire fog. As such, this gully was cautiously labelled as a natural inland wetland because really it is grazed gully pasture with deep muds. There is a stream channel (Ca0.4m wide, 200mm deep) in its base, comprised largely soft substrate with no pools (but some elongated wider runs), delineated as intermittent on Figure 6 of my Ecological Assessment. Upstream the gully enters the pine forest where there is a small giant umbrella rush and raupo feature on muds (#54 in **Error! Reference source not found.**) which gives way under pine to terrestrial ground cover – i.e. an ephemeral flow path after some 30m.

There is an additional gully arm joining this area from the south and that is part of the wetland #5 gully which is an ephemeral gully, steep with, largely wet pastures and juncus in its upper reaches. There is no fish habitat in the upper gully and very limited potential, 6 or 7 small pools in the lower gully.

A winter perspective of flow after a rain period suggests the following classification (Figure 4).

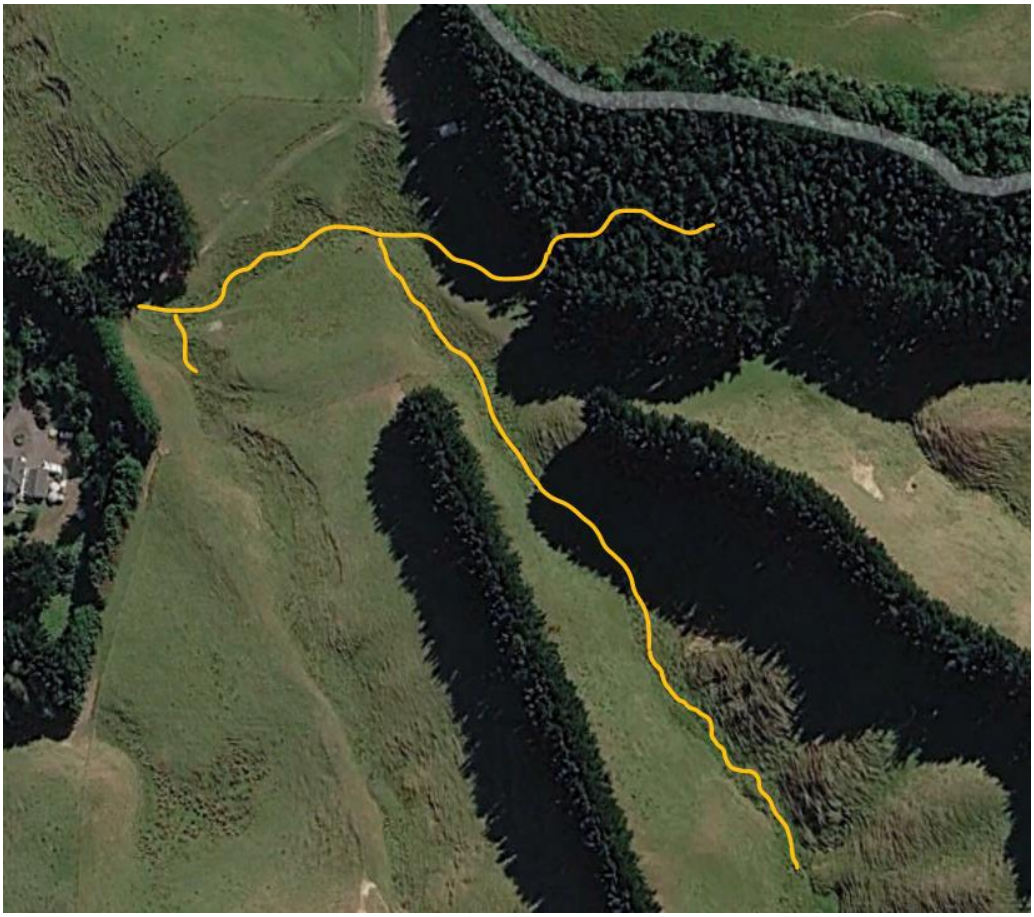
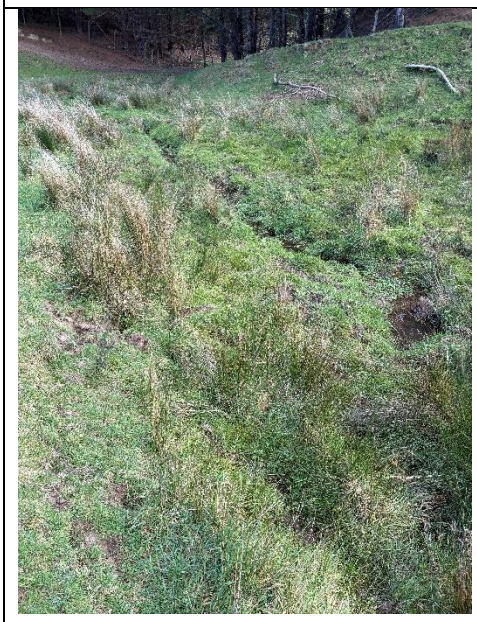


Figure 4. Winter viewed stream classification and extents.

The following are winter 2026 (July) post rain photos of particular features.

Upper end of main tributary with perched track culvert.

Side stream #5, lower mid reach



Typical mid reach channel leading up to terminal post culvert pool.

Depth and width illustrated in a rare gravel section.

End of intermittent channel under pine-no bed

Typical condition mid-upper reach a wide mud sponge.

Figure 5: Winter 2026 (July) post rain photos of particular features.

Thus, the proposed wetland C dams the gully to raise a standing water condition to allow a reed wetland to be developed above it. Currently there is very limited aquatic / fish habitat and that which is present is seasonal. The wetland will occupy the upper most 200m of poor quality, limited water habitat that is currently possible for fish in the main stem (into the pine forested catchment) and 240m of poor quality intermittent shallow semi wetland habitat up the other main tributary. This, as a proportion of the fish habitat in the Taupo stream represents around 5% and is some of the poorest quality headwater habitat given the intermittency and land use derived quality.

To date only koura have been observed in any of the pools or channel when they contain water.

As with wetland A, the creation of the standing water wetland may seasonally reduce some fish passage because the associated pipe is set to retain the wetland, and so may not have a flow in dry summers.

Thus, as at wetland A, it is not possible to put a continual flow passage into the wetland and keep the wetland. Nevertheless, at times of migration there should be passage for what few (probably) eel access this upper headwater.

As with proposed wetland A, fish (and koura) could be transferred into the wetland and eel adults would be able to move down stream under particular flows, to support a fishery into the wetland.

With respect to culverts P-39

Culvert P-39 crosses an eastern tributary of the kakaho west main stem. It replaces an existing farm track culvert (E-18). The main stem has fish present, and night spotting has shown short fin eel, long fin eel, koaro and banded kokopu are present (recent BGE memo to GWRC re additional fish survey (13.06.2026)).

However, the tributary associated with P-39 did not have fish presence during the recent night spot of the main stem and tributaries, and it does not have the structure or flows to support a fish population. Figure illustrates the confluence of the tributary with the main stem the day before the night spot survey. Depth of flow was typically less than 5mm.

Figure 6. Confluence of tributary through which P-39 passes at the main stem

The middle upper gully in relation to this tributary is recognized in my Ecological Assessment (section 3.3.3, figure 6) as wetlands 14, 15, 16. These are shallow gully depressions on steep hill slopes with a dominance of creeping bent and scattered Juncus (mostly *J. effusus*). A representative example (area 15) is shown below and clearly is steep, fully vegetated and largely pasture.

Figure 7 Wetland 15

There is no aquatic habitat for fish or aquatic invertebrates above the farm track culvert and very little downstream.

If the night spot survey did not find fish but fish are present then the loss of access via the replacement culvert P-39 does not exclude access to any fish habitat but instead a steep and largely wet pasture gully.

Conclusion

Section 3.4 of my Ecological Assessment describes the streams, highlights the general absence of fish habitat and the poor quality of that which is present associated with the small headwater tributaries other than the kakaho west main stem.

As stated in section 5.3 of my Ecological Assessment, the gains related to the proposed wetland creation are significant, with extensive reedland, rushland and sedgeland wetlands (more than 12,040m^2). Under that scenario the aquatic habitat potential of the site will be very much greater (70 times more) than the habitat of the current stock pugged, sedimented, highly eroded minimal water depth, channels that currently form the streams.

I believe this outcome far outweighs the provision of fish habitat to 2 intermittent streams with low quality upper headwater systems which likely have no or very low abundance of eel.

DOC commentary on Terrestrial ecology (Terry Calmyer, 31.07.2026)

There appears to be some confusion and in part that is reflected in DOC's response. That confusion appears to relate to the value of SNA029 and what is affected by the road expansion and accessway.

Ms Hooker for DOC assesses SNA029 as of very high ecological value. This assessment appears to be based primarily on rarity considerations (LENZ) as there is no statement she has visited to the site. I do not state what my opinion of the value is of SNA029 is, but I doubt it is very high given the area occupying a LENZ rarity class and kohekohe-tawa forest being regionally endangered (Singers et al 2018). My assessment was not about SNA029. Rather, my assessment related to the roading issue and the edge of SNA029 by SH59. The affected southwestern portion of the SNA (shown below) largely consists of exotic vegetation beneath a mahoe canopy. In particular there is a prominence of wandering jew under the canopy. Therefore, this is an area I consider should never have been included in the SNA. It does not have the indigenous representativeness, rarity or values of the wider important SNA and is not a buffer to the SNA but a weed source.

While I consider that the clearance on the eastern road side area is of negligible concern, the 1400m^2 of clearance incorporates that area and is a total SNA clearance figure. It is that figure which is then offset. The responses to the PCC comments above also address the DOC aspects regarding the offset.

At 4.14 of DOC's s53 comment, DOC (and Wildlands, see section 6.8 of the PCC comments) question my management of the SNA clearance. I record that all areas in SNA027 and SNA029 are accounted for but note that the portion of SNA029 that is cleared is not of the type, condition and value of the wider kohekohe forest SNA.

My estimate of the clearance area is derived from the GIS analysis undertaken by the engineers of the area required to be cleared for infrastructure, and so I assume the engineers' analysis is the most accurate measure of required clearance.

Regardless of the actual eventual outcome, because it appears that the culvert aspect may be retained as the natural stream (which will involve even more SNA vegetation clearance), the offset area can be expanded to a degree on site further around the eastern portion of SNA 029. Therefore, when the real actual clearance is known the response for offset can be finalised.

DOC state that they prefer the use of a BOAM model for the offset ratio determination (see above my response to PCC on this matter) and that the 60 year current growth means a time lag for return of the aged plant community. I agree that it will take several decades to regain the growth of the forest at the offset site and that the BOAM model can be made to indicate a 5:1 or greater ratio (see above). However, because of the weed infestation, the road edge effects and poor conditions, as well as the age of the area of SNA 027, I consider that a 3:1 well maintained offset is fair. That said, there is a case to be made for a 5:1 offset ratio also.

The other issues DOC raise which are not lizard related are similar or the same as PCC (Wildlands) regarding bats, and I reference those same reply's I make above.

However, with respect to bat presence and the use of pine and shelterbelt trees, as noted above, bat presence is highly unlikely. In the very unlikely case bats were detected then the resultant actions to be taken by the developer is management through the DOC tree felling protocol or the EHMP.

The matter is low risk and I suggest can be resolved using the process described above.

I note that in addition to the DOC submission on fish passage there is an additional section in the DOC's s53 comment entitled freshwater values.

At paragraph 4.55 DOC note that the potential values of the streams and wetlands on the property were not considered in the assessment and the values altered from what they are now to what they might be (i.e. improved by different land management). My understanding in undertaking RMA assessments has always been that my assessment identifies what the values and condition of a feature are at survey under the current land management, and not what the values and condition might be under imagined management.

The other matters DOC raise are the same as has been canvased by Ms Dixon and Dr Taylor. Please refer to my responses in the sections above in relation to these matters.

I do note specifically that with respect to seepage wetlands (paragraph 4.6), there are no indigenous vegetated seepage wetlands (those which are rare- nationally endangered) on the property. Furthermore, hydric soil testing (which DOC recommends) is not required where the vegetation allows rapid determination of natural inland wetland or where vegetation plots exclude the area as pasture.

I am not aware that Ms Hooker has been on site and delineated the farm as a whole, or even in part, and therefore unclear as to the basis for her conclusions that there are 35 additional wetlands which I did not consider that meet the wetland delineation criteria. I do note that those wetlands identified as ambiguous in my assessment were nevertheless afforded the natural inland wetland status through the assessment process. The excluded wetlands where only those that failed the vegetative test, i.e. pasture dominated.

Again, I reflect on the excesses of study DOC appear to require and the extent of effects management they see as appropriate when this property, having been fully farmed for decades and cleared over 100 years ago, simply does not remotely have the values important to the maintenance of indigenous biodiversity. It is a highly modified, water polluted, exotic system and the level of study and effects management responds to that condition.

Wellington Conservation Board (Sally Lee)

As stated the most significant disagreement is about the planted shrubland and the extent and significance of this area. The planted shrubland (and the roadside scrub) is the only indigenous vegetation affected by the proposal not addressed through effects management. Dr Fae (for PCC) has agreed that the feature is not significant and is of low value (while still seeking offset for its loss). It does not appear WCB shares that view on absence of significance or low value, citing habitat provision and connectivity values. I disagree.

In addressing the Boards unresolved issues, the responses above to PCC, GWRC and DOC (above) may assist because in the above I provide further evidence and explanation in regard to what is present, how further survey will not assist in effects management responses, how the offset package was developed, that bat survey should not be required (given the sites potential),that potential bird issues are managed appropriately and why the data presented is sufficient. I note that the lizard aspects are dealt with by Tony Payne.

I simply do not agree that the level of uncertainty about what is on site, what is affected and how it is managed is incomplete, insufficient or uncertain.

The values on site were largely removed before 1900 and the values which reman have been limited by many decades of farming practice. The quality of the habitat that is present is very minor contextually and provides almost no value in respect to supporting native fauna. The wetlands are pugged predominantly exotic grazed features, the indigenous area relatively recently planted including non-Wellington native species or road side incidental assemblage. Additional survey data will not change this view or cause greater values to be present. The current land use does not promote any improvement to the habitats and values present nor the water quality leaving the site, but the proposed development will substantially.

Recommended amendments to conditions

I recommend some amendments to conditions above in my responses. For ease, I have added them all here.

I recommend:

- A condition requiring a Ecological and hydrological management (EHMP) and a focussed certification process;
- That the EHMP specify:
    - The location and quantum of offset areas;
    - A requirement that the quantum of offset cannot be reduced by maintenance and other requirements;
    - That the retention wetlands in a particular catchment or stage are constructed prior to earthworks for that catchment or stage;
    - That the offset wetlands restoration and rehabilitation occur at the start of reclamation in each catchment;
    - The stream offset be implemented during Stage 1 of the Project;
- A condition requiring fish passage for the Taupō Stream culvert, and retention wetlands B and E;

Yours Sincerely

Dr Vaughan Keesing

BlueGreen Ecology.

30.07.2026