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Event: Weston Lea RMA Hearing Excerpts

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Before: Commissioner Wasley (Chair)  
Commissioner Lovell  
Commissioner Knott

Witnesses: Moira Pryde - bat ecology  
Kerry Borkin - bat ecology  
Laurence Barea - biodiversity offsetting  
Andrew Riddell - planning

**COMMISSIONER WASLEY:** Just a couple of matters first of all. Last week, the panel had indicated in terms of issuing a direction regarding caucusing. The panel are still discussing that matter presently and also concluded that they would certainly like to hear from the conservation for the issue in any such direction so, suffice to say, the terms of the panel discussion to date. Whilst there is caucusing outlined for late tomorrow morning and tomorrow afternoon, our feeling at this stage and depending on what we finally require in terms of our direction, is that we may need some further time for that caucusing to be undertaken.

I just wanted to highlight that point at this point in time and we will obviously issue any direction in due course but certainly in terms of bat ecology, as you can appreciate, it is exercising the panel's minds. We have had a lot of evidence on that last week and we are going to hear more today and tomorrow.

As you will appreciate, it is not particularly straightforward from our perspective. I just wanted to highlight that. It is a work in progress and we will advise all parties once we have developed our thinking further particularly from the hearing today. Ms Mackintosh, you look poised.

**MS MACKINTOSH:** Yes, Mr Chairman, I just wanted to query whether or not you will contemplate an adjournment to allow the (several inaudible words).

**COMMISSIONER WASLEY:** That is one option that the panel are considering and we also should take some advice too from the barrister that the panel has available to us.

**MS MACKINTOSH:** Thank you. I would like to take this opportunity to indicate support from the council's regulatory authority for the idea of an adjournment to allow sufficient time for the ecologist to agree what sort of (inaudible) obviously et cetera is appropriate. That can be an informed condition also to enable (inaudible) to consider all of that to be (several inaudible words).

**COMMISSIONER WASLEY:** They are all issues that we are 100 per cent going through at the present time, yes.

**MS MACKINTOSH:** Thank you. Ms Scott, you have two or three matters you wanted to add on this morning.

**MS WOODS:** I was going to add that Mr Makgill is currently sick but he is going to come later this morning so he sends his apologies.

**COMMISSIONER WASLEY:** No, that is fine.

**MS WOODS:** He will just be slightly late and I also just wanted to let everyone know that we filed Dr Parson's evidence in reply last night with the view that people may have an opportunity to read it before the client's evidence tomorrow. Hopefully we can put that up on the website and also we were hoping that that might provide some clarity if you were to provide some directions for the caucusing and questions that you may also answer.

Obviously, that is after considering that further but I just thought I would let you know that there will be more information.

**COMMISSIONER WASLEY:** Thank you, Ms Scott. Obviously it has been noted earlier we will hear more (inaudible) submissions and evidence today. We will hear from Dr Parsons tomorrow. It is the ability for the panel to consider those matters and also then, in terms of any caucusing, we have to put together a time

(a) in terms of issues around bat management, for example, which have been presented on and then what the nature of any particular conditions may be.

It is an issue of timeframes in terms of the adequacy of time for caucusing to be undertaken in terms of any particular facts and we would like to see the expert address and then, secondly, what conditions may or may not look like around all of that. We do have a few matters that we will continue to discuss. On that note, we will move to the Department for Conservation. Welcome.

**MR RIDDELL:** Kia ora kou tou. My name is Andrew Riddell. I am the planning witness for the Director-General of Conservation. I was told at 6.30 pm last night that the department's counsel is too ill to attend. I think it sounds like flu. It was too short notice for them to find an alternative lawyer, so I am sort of their master of ceremonies and a witness at the same time, if that is acceptable.

For the Department of Conservation, there are prepared written legal submissions and four witnesses, all of whom are here today ready to proceed. I propose that we start with the legal submissions. Then each of the witnesses can present their

evidence in the order of Ms Pryde who has further written evidence plus a PowerPoint. Then Dr Borkin who has follow-on comments on her evidence. Then Dr Barea who has further verbal comments and then myself who has further written evidence on adaptive management et cetera, natural area policies and pest control.

The first question I suppose I have is do you want the written submission in reply? We have also have (several inaudible words) from the Department of Conservation. He is not the panel but the department. Do you want the legal submissions read out or do you prefer to read them?

**COMMISSIONER WASLEY:** What we might do is we might take a short adjournment, read the submissions and then we will come back.

**MR RIDDELL:** I will also add that if you have any questions, we can obviously get them answered in writing.

**COMMISSIONER WASLEY:** Yes, all right.

**MR RIDDELL:** Depending on how long the hearing goes and continues from now, it may be possible that the lawyers will need to come along and actually answer verbally anyway.

**COMMISSIONER WASLEY:** Just as a matter of the process this morning, is Ms Pryde going to be the first witness?

**MR RIDDELL:** Then Dr Borkin and then Dr Barea and then myself.

**COMMISSIONER WASLEY:** We have had a short discussion in terms of Ms Pryde and Dr Borkin that they could both present and then we could have them both sitting there and then we can ask questions. We found last week the (inaudible) of live witnesses worked really well.

**MR RIDDELL:** We have already asked them that and they are happy with it.

**COMMISSIONER WASLEY:** Thank you.

**MR RIDDELL:** I am wondering if you will just let me finish this before you adjourn.

**COMMISSIONER WASLEY:** Yes, that is fine.

**MR RIDDELL:** There are two other matters I just wish to raise. The first one is that evidence in reply from Dr Parsons was

received by email at 12.27 am. Therefore, any comments by the department's witnesses and the traverse is not just about ecology but also into planning matters in terms of adaptive management and what is adaptive management. We would submit we should have the opportunity to do that in writing in a week's time to have the chance to read and digest it.

**COMMISSIONER WASLEY:** That is noted and depending on where the panel gets to in terms of directions and evidence this week, we will certainly come back to that matter.

**MR RIDDELL:** On the caucusing, I note that later in the afternoon from about 4.00 pm on, Ms Pryde has a flight. Dr Borkin has a meeting and I think probably also Monday, Dr Borkin is on leave. Points to note to try and further that jigsaw that you have there.

**COMMISSIONER WASLEY:** Yes, and it is a jigsaw in terms of the availability of witnesses, not least of which but also in terms of panel members too. If that is all, let us start.

**MR RIDDELL:** Thank you.

**COMMISSIONER WASLEY:** We will take a short adjournment until, say, 9.35 am and we will see how we go. Thank you.

(A short adjournment)

**COMMISSIONER WASLEY:** We will reconvene. Just before we do that, my apologies for calling you Ms Scott. I was reading another legal paper - and it is nothing to do with this case - very early this morning which was prepared by a Ms Scott. My apologies for that. Mr Riddell. Just before we go, we have read through the legal submissions. We do not have any legal questions. We will no doubt have questions for witnesses.

**MR RIDDELL:** Do you need copies of the cases referred to?

**COMMISSIONER WASLEY:** Yes. If you can put those on a data key, that would be most helpful. We do not need hard copies.

**MR RIDDELL:** The Director-General's first witness is Ms Pryde.

**COMMISSIONER WASLEY:** Thank you. Welcome, Ms Pryde.

**MS PRYDE:** Thank you. My name is Moira Anne Pryde so I work as a technical advisor for the Department of Conservation and I am

based in Nelson. I have prepared a statement of evidence dated 23 April 2019 which sets out my qualifications and experience.

This is a further statement of evidence prepared after reading the evidence in reply by Dr Flynn, Ms Cummings and Mr Serjeant and after receiving (several inaudible words) report. Sir, that has been circulated?

**COMMISSIONER WASLEY:** Yes.

**MS PRYDE:** You all have copies?

**COMMISSIONER WASLEY:** We have that of course.

**MS PRYDE:** I do not make any amendments or alterations to the analysis and conclusions I made in my first evidence but rather, in this one, I will provide some additional clarity around the rationales of (inaudible).

The scope of my further evidence is to revisit the significance of long-tailed bats on the Amberfield site, to clarify points, and provide further information for managing adverse effects on the nationally critical long-tailed bat population.

So the conservation status of long-tailed bats have no doubt been drummed into you. Long-tailed bats are nationally critical, the highest threat category in New Zealand species. So in the early 1900s, bats were regularly seen in our cities, reports of seeing them in their hundreds and thousands, and since then there have been significant declines, and in the areas that they still survive, they are in decline and they're now threatened with extinction. Hamilton is one of the last cities where bats persist.

In the colonies that have been studied nationally, the rate of decline is far greater in populations that have no management. This decline is between 5 to 9% per annum. So declines in bats are from a combination of threats, including habitat loss through land clearance, predation, and competition by introduced predators, habitat degradation, fragmentation and disturbance at roosts, and introduced predators, including stoats, cats, rats and possums have all been implicated in the decline.

So I'd just like to go through the specialist requirements of long-tailed bats. Long-tailed bats have very specialist requirements in terms of breeding sites, home range and foraging

requirements (slide 1). So I'll just put this up to show the size of a bat in the hand. There was a Stuff report on a Hamilton park that was closed because bats were roosting and the trees were unstable. This is a picture of Australian fruit bats. So our bats are small, size of a mouse. They don't have rabies. They're not scary; they're cute. And this is one of the two species that we've got that remain.

So long-tailed bats are long-lived, greater than 20 years. So in studies in the Eglinton we've got a 23-year-old bat we are still catching. So they can persist in the environment for a long time, but that may not mean that they're doing well. Just because we're detecting them doesn't mean that they're ... They might just be existing rather than flourishing.

Long-tailed bats breed once a year and generally just have one pup. An adult female can start breeding between one and three years. This means that the population can take a long time to recover, barely replacing themselves. Adult females congregate in maternity roosts between November and February, generally moving to a new roost frequently and carrying her young with them. Clusters of reproductive females form small social groups of about 50 to 100 bats.

Often several social groups will be found in the bat landscape. Each group tends to have a distinct roosting area, but the foraging area will be shared with all the social groups. This information is based on studies down in Fiordland and the Eglinton Valley but is also applicable to other areas such as South Canterbury where we've done some work.

Foraging areas are large, and in the Eglinton, the colony of bats ranges over 12,000 ha. In Hamilton, the accumulated data from the Davidson-Watts report shows the range width is 9.5 km and therefore covers about 7,000 ha. That's just the database DOC holds. That's all the records that I have to date. The yellow dots are just all the instances where we've detected bats, and the black dots are where we haven't. You can't see many black dots. So it's just a general area of where the bats are found in Hamilton, generally to the south.

Long-tailed bats shelter and breed in roost trees. The cavities they select are very specific and these can be quite rare in the landscape, even in native forest. In a study in Eglinton Valley in Fiordland, only 1.3% of random trees above the 20 cm DBH, which is what we consider they're using, had optimum characteristics for breeding. That extrapolates to 3.8 cavity-bearing trees per hectare. That's not many trees that

they're using that are suitable. A forest in the Eglinton Valley provides enough possible roosting trees for bats and allows a choice.

Roost cavities tend to be well-insulated with preferred roosts increasing in temperature during the day, reaching a peak at dusk, allowing the lactating females to leave the young alone and forage while the temperature is maintained in the roost until the mother has returned.

Bats surviving in a modified landscape such as Hamilton will still tend to choose the largest and oldest trees available, and this tends to be in the exotic trees, as shown in the Davidson-Watts report.

In a study in South Canterbury, the trees that the bats were forced to use were suboptimal for breeding and poorly insulated. Juvenile survival was much lower than in Fiordland studies, with only 24% juveniles surviving compared to virtually all young surviving to fly in the Eglinton. The 5-year study showed that the population was declining by 9% per annum and the population was at risk of extinction. Reducing the number of available roosts in an already stressed population is a significant risk. For example, in South Canterbury, in one

social group, 25% of the trees were felled, which led to the local extinction of that social group.

It is likely that the Hamilton bats that are surviving in the peri-urban, fragmented landscape are on a similar trajectory to the South Canterbury bats. Loss of habitat and habitat degradation is the greatest threat to these bats, as well as introduced predators.

The Southern Links radio-tracking project provides a small snapshot of time to show how the bats are using the landscape. The project has identified 54 roosts with 82% in exotic trees, and 15 of these roosts are definitely maternity roosts. Twenty-four bats have been radio-tracked and a total of 79 bats identified. This is a fantastic result, but it must be noted that it's only a fraction of time of year that the bats have been studied. It can take several years of bat work to understand how bats are using the landscape.

Slide 3. So this is a table of the Southern Links radio-tracking project, and I'd just like to highlight the number of full nights of radio-tracking for each bat. It's very small numbers. So although there's been a lot of work that Southern Links has been doing, it's still extremely small numbers in the

life of a bat or in a year of activity of a bat. So, for example, bat 15, there's zero nights of full radio-tracking and only one part-night tracking. So it's a small number. So we have to be careful how we interpret that data.

So, significance of the Amberfield site and the potential impacts on bats. Acoustic surveys have been done in the Amberfield subdivision and the surrounding area, and the yellow dots show the activities or number of passes, and I've just rated this according to the site (several inaudible words) number of passes. The black dots are no passes. So that's accumulated over two seasons.

In my experience of acoustic survey work, the activity levels are high and greater in the northern part of the subdivision compared to the south. Acoustic recorders are, however, notoriously difficult to interpret, and often you can only say with certainty the times of the calls and whether bats were present or absent. The surveys showed that the bats were present in the majority of the sites surveyed.

As there are so few trees within the Amberfield subdivision - you can see with that overlay very few trees in that area - it is likely that bats are limited for roosting sites. And this

goes for the whole of South Hamilton. In my opinion, therefore, all trees should be considered for avoidance of removal.

Three roosts were found on the Amberfield project site by the Southern Links radio-tracking project, and you can see those three purple roosts on the Amberfield site, and then the pink ones out to the west, one of them was a confirmed maternity roost and two of them were possible maternity roosts. It's not far from the Amberfield subdivision.

The northwest shelter belt is likely to have roosts. One roost has been found in the ornamental gardens, which is that one in the centre, and there are likely to be more. The significance of the individual trees in the pastureland is unknown as they have not been surveyed. So if we go back to the previous slide, all the acoustic surveys missed out that big chunk of vegetation on the northwest of the subdivision as well as the north-south shelter belt. So there's no acoustic survey work done there.

In my experience of South Canterbury, we found several roosts in individual trees in the pastoral landscape. Ms Cummings stated that roosts are solitary, but only one roost was watched at dusk. The radio-tracking that was done in the

Amberfield area was done in late February and March, which is when the bats are beginning to disperse. So if the roosts were solitary, then this is not surprising, but we have no evidence to say that they definitely were.

The bats that were followed were males, which, in my experience, do not spend a lot of time in maternity roosts, unless they are juveniles. So they're less likely to provide much information on communal roosts.

As I stated before, the radio-tracking study is only a tiny snapshot of what is happening with the bats in the site. Radio-tracking of adult reproductive females within the breeding season in this area is required to assess the likelihood of maternity roosts and reduce uncertainty.

The habitat analysis done by Davidson-Watts, 2019, clearly showed that trees and waterways were significant for bats. Agricultural land was utilised, and the least important habitats were urban and industrial. In terms of the agricultural land, there are various studies where we have radio-tracked and observed bats feeding and flying over agricultural land in the Eglinton and South Canterbury.

The potential impacts of the Amberfield subdivision are direct deaths through felling of roost trees, loss and fragmentation of feeding habitat and shelter within the subdivision, the loss of present and future roost trees, increased noise and lighting in the subdivision impacting on foraging, drinking, feeding and commuting of bats, the impacts of the construction noise on feeding and the impacts of increased traffic and an increase of urban predators, eg cats.

The adequacy of the proposed mitigation and conditions offered: I consider that there has not been enough focus on avoidance of bat habitat, and the confidence of the mitigation offered is unreasonably optimistic given that the methods used are mainly experimental for bats.

Dr Flynn disagrees that the methods are experimental, but in my opinion, vegetation planting for mitigation for bats is still experimental. The overreliance of the east-west shelter belt, the gully and the river margins providing adequate quality for the bats using the Amberfield area, whilst removing the pasture at the north-south shelter belt, the clusters of trees by the ornamental gardens, the single trees, and replacing them with houses is in my opinion high-risk.

Given the small amount of suitable bat habitat that's on the Amberfield site, I consider there has to be greater consideration to design where the houses can be built around the existing vegetation. Allowing the current vegetation to remain and enhancing that vegetation within the housing design is more likely, in my opinion, to lead to more positive results, rather than clearing the site and relying on planting.

The consideration of only light levels in determining the width of the buffers does not allow for quality of habitat; hence the reason I agree with the recommendation for larger buffers of at least 100 m. In my opinion, an adaptive management approach as advocated by Dr Flynn is not appropriate for this project, as once the housing is in place it cannot be reversed.

Monitoring of bats is difficult, and even with detailed mark recapture data, survival estimates for the current season rely on data from the following season. Acoustic recorder data will only give presence or absence for that year, and at least six years of data is required to detect trends. This may change, depending on activity, but as far as I know there has been no prior analysis to work out how many years of data you need to detect a trend.

I'm unclear what the triggers the applicant is intending to use and what they're going to do. In my work with long-tailed bats, I've watched at least two social groups go extinct, and this process is slow and hard to detect and respond to. Social colonies decline to a low number, which eventually becomes non-functional.

Artificial roosts are a mitigation option, and two of the boxes were used as communal roosts in the Hamilton radio-tracking project. This shows they are a promising tool in bat management. I still, however, see artificial roosts as experimental rather than a solution. We do not know if they provide adequate conditions for adult females and juvenile bats to achieve high survival rates to allow the colony to persist.

Predators are a significant issue for bats. I agree with Dr Flynn that ideally predator control should be considered at a landscape level but would encourage the applicant to think proactively and promote the subdivision as bat-friendly and not allow owners to have cats. Cats are a significant issue for bats and fragmented and forested environments. In South Canterbury, a large proportion of early bat records came from cat owners when their cat brought in a bat. Cats are capable of

killing bats in flight. So it's not just at roosts but also when they are foraging or drinking that they are vulnerable.

Slide 6. This is actually short-tail bats, but it just shows the ability of cats to find an area where they can catch bats, and they progressively catch a large number of bats, potentially wiping out a colony. That's one cat on the left that caught all those bats, and then the recent one in (inaudible) Forest. These are both from (inaudible) Forest. They caught another 50 bats at the bottom of a roost where a cat was involved.

Overall, I consider the applicant is overly confident of the proposed mitigation and relies on an adaptive management approach which is, in my view, inappropriate for managing a nationally critical species in this situation. Thank you.

**COMMISSIONER WASLEY:** Okay. Thank you, Ms Pryde. I think we'll go straight on to Dr Borkin and then I'm going to ask --

**DR BORKIN:** Thank you.

**COMMISSIONER WASLEY:** (several inaudible words). Welcome, Dr Borkin.

**DR BORKIN:** Good morning. My name is Dr Kerry Maree Borkin. I've prepared a statement of evidence which is dated 18 April 2019, and that's been precirculated. I confirm I have the qualifications and experience set out in that evidence, and I've got additional comments in the summary of my evidence today.

**COMMISSIONER WASLEY:** Thank you.

**DR BORKIN:** Since the submission of my evidence, I have read the evidence of Moira Pryde, Laurence Barea, Andrew Riddell, Bruce Clarkson and Rebecca Stirnemann and (several inaudible words). I've also read the recently released report covering radio-tracking of long-tailed bats in southern Hamilton by Davidson-Watts and the proposed EMMP for Southern Links.

I note that the Amberfield site is used most nights when monitoring has occurred, and bats have been observed foraging at (inaudible) and roosting there. There are three known roosts on the site, which may be communal or solitary. This is unknown because sufficient monitoring did not take place to confirm the numbers of bats using these roosts.

Stating that because the bats radio-tracked to the roosts was male is not sufficient to confirm that the roosts are solitary. The recently released radio-tracking report by Davidson-Watts indicated that male and female bats were roosting communally during this period. The applicant does, however, acknowledge that there is a likelihood of more roosts present throughout the area.

Of the bats radio-tracked to date, it appears that four bats had home ranges where the core or main areas of use were either within Amberfield or within the river corridor immediately adjacent. Two of these bats had poor areas in the northern end of the Amberfield site and were only radio-tracked with very little time, so no full nights for one of the bats and only two full nights for the others. So information is limited in this area.

Given the very short nature of these radio-tracking programs, on average five to ten days, they should be considered a snapshot in time and therefore much is unknown and uncertain. Consequently, it is possible that there are additional roosts in the area and more bats could be using this area regularly, as many bats have not been radio-tracked.

What is known is that during each period of radio-tracking, new roosts were being found. During the first two sessions of radio-tracking, new roosts were found on 11 out of 12 days in the first session and in the second session on 6 out of 9 days. This suggests that there are undiscovered roosts in the Southern Hamilton area.

In Hamilton, each roost should be considered important because they are used for long periods. Dekrout, in researching for her PhD, found that use of roosts were for up to 19 days in a row and the majority of bats only used one tree during radio-tracking.

The felling of trees has been associated with population declines or crashes for long-tailed bats. This has been confirmed in plantation forests and in farmland areas. One of these sites is near Geraldine, and during this time, as a previous witness pointed out, 25% of roosts either were lost naturally by treefall or were felled for firewood. These were in an area known as Collet(?) Road. Since this roost loss has occurred, the group of bats using the Collet Road roosts has disappeared and are likely extinct.

The Davidson-Watts report also shows importance of trees within this landscape. It suggests that the presence of trees, including (several inaudible words) and isolated trees, increased use of the area by bats, including the pasture areas. What is also known for long-tailed bats is that increasing light, roading networks, overnight traffic and urbanisation are all associated with less bat activity. Davidson-Watts found that when habitat use was analysed, urban and industrial areas were least likely to be used by bats. A change from the type of habitat currently available at Amberfield to an urban area will make it less preferred by bats.

Most bat activity in Southern Hamilton takes place where light levels created from all light sources, including residential, are below 0.5 lx. As a precautionary approach, a cumulative limit for all light sources, including those created by homeowners, could be set as below 0.5 lx because at this level activity has already reduced.

Little research has taken place into the effectiveness of mitigation measures for any bat species. Consequently, a precautionary approach is advised when addressing any likely effects. Thank you.

**COMMISSIONER WASLEY:** Thank you. Questions from the panel.  
Commissioner Lovell.

**COMMISSIONER LOVELL:** Right. Ms Pryde, you refer to the DOC recovery program and the management tools you used in your evidence. Can you give us some context of what's been effective in terms of management tools you've used, in terms of the recovery program?

**MS PRYDE:** The main research in DOC for bats has been in forested areas, and we were looking at predator control. So where we did use an adaptive management approach in that, I believe is a suitable way of using adaptive management where you do a certain level of predator control and you find out whether it's enough. And, in our case, 900 ha of (inaudible) stations, which wasn't enough, and we increased it until now we're doing (several inaudible words) over large areas.

The fragmented habitat, as it's not DOC land, the research is limited. So in South Canterbury we still advocate for predator control, but the greatest risk for a fragmented habitat is habitat destruction and loss of feeding, foraging and roosting sites. And that's more complicated management.

So, in South Canterbury, we've been working with the councils identifying bat areas and that's in progress at the moment and they are considering that significant natural areas for any trees in a bat area is important. So that's going through council at the moment. I guess you can understand that it's a joint management. It's not just up to DOC to manage those areas. It's not our land. It's on private land. It's on council land.

So it's tricky, and I understand that, and in Hamilton you've got the same kind of thing. It's not just a DOC thing. But DOC are well aware of what we should be doing for bats, but the pest control is still ... We've got some good methods in the south of New Zealand and beech forests but we're still working out better ways for fragmented habitats. So that's still in progress. There's no one solution. It's a combination.

**COMMISSIONER LOVELL:** Okay. So a bit more on that point, on the points you made around (several inaudible words) parties and the need for outside information to start processes, including (several inaudible words). You've both referred to concerns around the survey information that (several inaudible words) and on Amberfield and, of course, the radio-tracking survey. I

understand what you say in terms of the length of time it takes to fully understand a bat colony or group - that can take a number of years - but what's your sense of getting a baseline understanding of a group and how long it takes or can take, in terms of your experience? Do you have a sense of that?

**MS PRYDE:** In my experience, five years radio-tracking gives a good idea of how bats are using the landscape. So that's the mark recapture study and survival. So if you do it for any shorter, your survival estimates are compromised because you've got the first year of the study and the last year of the study. So the only useful ones are the ones that are in between. So five years gives you a better idea of a core area and what the survival figures are like.

**COMMISSIONER LOVELL:** And picking up on your reference of social groups that are extinct. Over what time would that occur and what -- do you have a sense of what the indicators will be? We picked up that, you know, either during that time or -- in terms of the causes for extinction?

**MS PRYDE:** So the two cases I was referring to, one in the Eglinton where the bats at the edge of the national park went extinct so you just -- we find it harder and harder to catch

them and eventually we had to acknowledge we -- that the group had gone extinct.

It seemed like it got to a certain number of bats where they were unable to function and one or two of those bats went over to another group.

Similar kind of thing happened at Collett(?) Road and Geraldine(?) that Dr Borkin was talking about as well. The landscape was changed, so we knew there was habitat degradation going on. The trees were felled and we could no longer catch those bats.

One or two surviving ones may join another group so that is possible but it does seem like they get to such a low number that because they're a communal species, they can't survive with just one or two of them so they have to look for another group. If they manage to find one, that's good but if they don't then they don't survive.

**A MEMBER OF THE PANEL:** And picking up on elements that you note in your evidence that the likely number of bats around Amberfield is based on the number of concepts, I think it was. We've had evidence that suggests that the number is around 61.

In terms of that range (a) do you think that is a reasonable number? and (b) that the other group, how close is that to the extinction marker?

**MS PRYDE:** So I think that is a reasonable number but we don't know whether that is split into little social groups. So if that total number is made up of several small colonies or social groups then you're getting down to low numbers. So, as I've said before, although we've done a lot of work it's a very small amount of data to make what I consider is really important decisions on how you manage this population.

**A MEMBER OF THE PANEL:** Picking up on two points, one is that around roosts and (inaudible) forests -- and one of the submissions has been around mitigation, that we could use artificial roosts until vegetation is sufficiently high. Dr Stirnemann noted that it's not clear whether artificial roosts are used because they're good or simply because it's the only thing that's there. What are your thoughts based on your experience?

**DR BORKIN(?):** Yes, in my opinion the artificial roost boxes in Hamilton are used because cavity numbers are really, really low here because there aren't the old trees that form those cavities

in sufficient numbers and so that's why their use is higher than the two or three bat boxes that are used in this area. And it does take quite a long time for those to be replaced by native forests, obviously. I've had some colleagues suggest it would be at least 80 years before any cavities would be formed in that native vegetation.

**COMMISSIONER WASLEY:** You mentioned two or three are used. How many are provided?

**DR BORKIN:** I'm not sure on the total numbers because there are a number of different projects that have got --

**COMMISSIONER WASLEY:** I was just wondering --

**DR BORKIN:** There are at least 27 that are by Project Echo and there are another -- there's been through the recent consent process (Several inaudible words) that they have roost boxes but I'm not aware of the numbers that they provide. But there are also other projects along the Waikato Expressway that provide roost boxes which have recently been installed and I believe they require monitoring each year as well.

**A MEMBER OF THE PANEL:** One of the questions I actually asked was -- perhaps I can ask Dr Parsons? Whether there is actually literature now on that subject? Whether it's Hamilton and why the roosts -- and artificial roosts and their actual take-up. Do you know of any?

**DR BORKIN:** There's none in New Zealand apart from just anecdotal reports of use, and that's relatively low. That's an emerging field in Australia which has similar species and perhaps we can look to Australia for some guidance on that.

**A MEMBER OF THE PANEL:** So in terms of artificial roosts, how long have they been around? That the roosts are there?

**DR BORKIN:** Right. So the history of artificial roost boxes is people just basically put them out to start with and didn't do any monitoring. So that's been a bit of a limitation. The longest running project has been going for maybe 20 years in Australia with species that are related to New Zealand bats and dominating those roost boxes. So they've got a bit of information and use relatively similar roost boxes to what was provided here in Hamilton.

**A MEMBER OF THE PANEL:** Do you have any sense of what's come out of that?

**DR BORKIN:** They do use them for breeding in Australia and at all times of the year in habitats where cavities are likely to be similarly low in natural roosts.

**A MEMBER OF THE PANEL:** Just another comment on artificial roosts, one of that comments we've received is that artificial roosts could be a mechanism for pest control. What are your thoughts on that?

**DR BORKIN:** I think that limits their usefulness really to control the roosts that are known and that are provided artificially so that doesn't protect any of the natural roosts that are in the area. And if you're looking long term to replace artificial roost boxes with native habitat, then that won't protect any of the native habitat natural roosts.

**A MEMBER OF THE PANEL:** One final question. In your evidence in reply, at paragraphs 28, you say that houses could be designed around the planting, but will this lead to the objective of (several inaudible words) loss given we've got (inaudible)

saying that urbanisation and bats aren't a natural fit, as it were. How effective is it likely to be here in (inaudible)?

**MS PRYDE:** We don't know. So why I'm saying that is because I don't think they've given enough credence to or discussion to avoidance so maintaining what we've got left is, in my opinion, extremely important if this housing development goes ahead. But we have to acknowledge that it is experimental and we don't know if they'll survive.

Back to your point of artificial roosts, the South Canterbury study where we put out -- we imported a lot of artificial roosts made of woodcrete which have good thermal qualities and the uptake was very low in South Canterbury. So only two of those roosts out of a hundred were being used. It seems to be a better uptake in Hamilton. Yes, but it's still very experimental and they have to be maintained all the time. So cleaned every year because birds will use them, geckos will use them, spiders, all wildlife (several inaudible words).

**A MEMBER OF THE PANEL:** One of the lists that is noted I think it is in Mr Riddell's advice at paragraph 168 of the matters which you consider will assist in avoiding various aspects, you've seen the revised conditions that were done to (Several

inaudible words) feeding and the bat plan. Do any of those conditions in your mind move towards some of the avoidance of things you're talking about? Or is that something I should ask Mr Riddell?

**MR RIDDELL:** Do you want me to answer that?

**A MEMBER OF THE PANEL:** We can wait for your evidence (several inaudible words). I'm just asking in terms of -- the list was -- it's in your (several inaudible words).

**MR RIDDELL:** Paragraph 168.

**A MEMBER OF THE PANEL:** Paragraph 168, yes. You'll note that, for example, the (several inaudible words) and has started to settle at right levels. So what I'm asking you is based on the new conditions, are more reliant towards what we're looking for?

**MS PRYDE:** I still think we need further discussion between our ecologists on that. There's a number of points we still disagree on.

**A MEMBER OF THE PANEL:** Okay.

**COMMISSIONER WASLEY:** Thank you. Just turning to your statement you went through this morning where you're talking about the conservation status of long-tailed bats, and you're talking about the level of decline that you've seen. So are all those populations in the various locations around New Zealand, are they all in decline? Everything's in decline?

**MS PRYDE:** In places where we're doing management they're doing well.

**COMMISSIONER WASLEY:** So the management is actually important to --

**MS PRYDE:** Yes, it's important and increasing.

**COMMISSIONER WASLEY:** Yes, okay.

**DR BORKIN:** I believe in all the other populations where management is not happening then they are in decline.

**COMMISSIONER WASLEY:** Yes, okay. And so we don't have figures at the moment, do we, to understand what's happening with this population currently?

**MS PRYDE:** No.

**COMMISSIONER WASLEY:** So we don't know whether it's stable or in decline. So moving on from there, I just wanted to hear your paragraph 15 and again, it's a question for both of you, whoever feels best to answer it.

You're talking about this whole issue of exotics versus native vegetation as roosts. So am I right in saying to positively manage the environment for the bats in this location you'll been looking to actually get more natives in there because they actually provide a more optimal roost long term? Am I right in saying that? So currently we've seen that they've using exotics in this area but longer term you believe that natives would be an improvement?

**DR BORKIN:** I think that anything old, so the they're longer they're in the environment the better. So it happens that native vegetation is often left for longer in the environment so it has the ability to create cavities. So that's one -- Moira, you may differ on that.

**MS PRYDE:** No, I agree. So some of the exotic trees they are growing faster and if they are -- to become a bat tree it needs

to sort of go through a period of -- bits die so that it forms cavities. So it's a matter of not really exotic versus native. It's like more of the cavity forming, more of the thermal qualities of the wood rather than it being a competition between the native and exotic.

**DR BORKIN:** So the younger or faster growing exotic species, they may be roosting under peeling bark. So as you can imagine, that's not a very well insulated roost and so it's likely that survival is impeded in those sort of roosts whereas in a large native or other tree that has got thick area of wood in the cavity, it's better insulated so those are more what they look for.

**COMMISSIONER WASLEY:** So with management and regarding whatever an area, you're probably (Several inaudible words) but surely your long term, I guess -- yes, okay. I just wanted to -- perhaps I think look at slide 2.

Yes, so just looking at that and this position of bats throughout the area, just interested that we've got that sort of remote area to the northeast, that Newstead mark there, but that's all part of the same sort of grouping of bats? They, you

know, bats are trapped there like to come into Amberfield and the other area where the yellow dots are?

**DR BORKIN:** I understand that when Andrea Dekrout did her research largely catching bats in Hamilton Park opposite the Amberfield site there were bats that were using roosts out near Newstead and also around Hamilton Park as well. So it's likely they're the same -- at least associated with the same populations and potentially with the same social groups.

**COMMISSIONER WASLEY:** Moving between those two areas would be along that sort of gully system we see going up there? You'd think -- they're able to extend out into that area because of the vegetated linkages between the two, is it? They're not going to be flying over the grey urban area that you're seeing there. You think --

**DR BORKIN:** You'd see slightly they were flying over those urban areas and Andrea Dekrout found that in general they were flying along gullies and anything -- I think she called it topographically complex which is generally gullies in Hamilton, greenspaces and less likely be in the urban areas with more street lights and more road networks.

**COMMISSIONER WASLEY:** If we can move on to the next one. So I wanted to pick up some features on here, or just some questions, really. We start to look at some of the yellow dots that don't look that distant from sort of little white marks which I presume is the roof of a house or whatever. So we've got bats which are quite close. And also if we look in the middle of that grouping at the top in Amberfield, we seem to have a couple of yellow dots which are near the existing houses by the look of it. Is that what you'd call ordinary gardens rather than (inaudible)?

**DR BORKIN:** Yes.

**COMMISSIONER WASLEY:** So we've got bats clearly (several inaudible words) moved to residential there but is that because the level of activity for that residential is so low that it can work, you know, they can work together?

**DR BORKIN:** That's quite a dark area currently. Not much traffic and it's still got quite a few trees, some open space as well. So I suspect that's why bats are still there. When LaRue and LaRue were looking at activity throughout this Hamilton area, they found that with any increases in residential that bat

activity went down significantly and so this is one of the lower end of residential in this area currently.

**COMMISSIONER WASLEY:** Okay, and then to pick up some other points that hopefully point you to on this, there's mention made of the north-south shelter belt. I thought we've talked about the east-west shelter belt, but I wasn't sure whether the north-south one --

**MS PRYDE:** The north-south one is underneath the green line. So there's a little line of trees which weren't surveyed. So all the areas that don't have yellow dots and there are black dots, they weren't surveyed so there's quite a proportion of vegetation here --

**COMMISSIONER WASLEY:** Do you have the --

(overspeaking)

**MS PRYDE:** Up there. So underneath the green line it's there. If I take that green line away but there is a little line of trees.

**COMMISSIONER WASLEY:** So we've got the entrance feature -- I think the plan you have I think shows an entrance feature there because that's one of the routes in, from memory, and then we've got a little green further in? So I just want to double check before we move on. So looking at the (inaudible) area, we have a bit of a green area really --

MS2: It might be useful if we pass you a copy of this, just to see actually -- yes, I'm not sure which page number it is but it's that one. It's about six or seven pages in. Maybe not.

(overspeaking)

**COMMISSIONER WASLEY:** Yes, so just double checking whether -- is this yellow development bit that's on the back of those lots as you come into the boundary, or is it connected to those two pieces of green (several inaudible words)?

**MS PRYDE:** It's on the boundary.

**COMMISSIONER WASLEY:** It's that bit on the boundary? So a little bit showing there? Okay, thank you. Then sort of just thinking about the shelter belt issue, we've got this issue you discussed about how many bats are on the east-west shelter belt.

But from other witnesses we've heard discussion about whether or not the -- recognising that the plans show the east-west shelter belt being retained without the spacing around it, you're suggesting.

But we've had other witness comments about whether as an alternative the gully where we've got -- (several inaudible words) these broad dot in it, often a bit gully between the outlying and the main site, being the most cases is whether or not that could actually longer term provide an alternative if the maintenance of the east-west shelter belt doesn't sort of allow a group of bats that you wanted to encouraged? I mean would you see the gully as a potential alternative to relying on the east-west shelter belt through to move to the wider gully beyond?

**DR BORKIN:** Given that long-tailed bats prefer gullies, it would be useful for that to be revegetated as well because it would also provide areas for roosts, foraging that may be more buffered as well. But a loss of any of the areas will possibly fragment the population further. I think Moira might just --

**COMMISSIONER WASLEY:** Yes, I was going to -- yes.

**MS PRYDE:** I guess those really higher up in the northern parts would be reluctant to try and rely on that southern gully as the only chance that the bats can get across that site. So, yeah, I think both and more is ...

**COMMISSIONER WASLEY:** Do you think long term, for instance, if the gully was replanted, revegetated and gradually over time do you think you could sort of gradually rely on that more than the other or you would still be looking at both?

**MS PRYDE:** I think from what's been studied in other countries is you can't force a bat to move into a particular route. If they're using that route they're doing it for a reason and they probably want to keep to that. So providing a little bridge or whatever somewhere else is not that useful for them because they're going to go the way that they're going already.

So using the current features, enhancing the current features that are using already would be, in my opinion, much more preferable. And the fact that we haven't got any acoustic surveys around the bits of vegetation that I'm talking about is also a concern to me.

**DR BORKIN:** There is certainly some evidence from overseas suggesting that unless flight paths are followed for mitigation then they're not effective. So I agree with that.

**COMMISSIONER WASLEY:** So existing flight paths. Okay, I think that's probably covered off the notes and questions that I've got. So thank you.

So who has got the -- the use of trees. We touched on that this morning. What sort of minimum height and characteristic of a tree in terms of potentially being used by the bats?

**DR BORKIN:** That depends on what's available on the landscape. So it's almost a selection hierarchy that they would have. So that's quite hard to answer. Obviously, the top ones would be canopy producing, those are generally large trees, going down to quite small roosts. I've found I believe the smallest diameter tree is about 15 centimetres, its DBH, that I've found in my research but then that's -- and that would impact more likely in this landscape because there's not that many roosts around. Sorry, that's a very difficult question to answer. Maybe perhaps Moira's got something?

**MS PRYDE:** Yes, so I would say 15-centimetre DBH --

**COMMISSIONER WASLEY:** Sorry, I missed that.

**MS PRYDE:** So, above that 15-centimetre DVA. So the bigger trees and they tend to prefer trees that have less clutter around so that they -- because they're age specialist and when juveniles are coming out they need a clear pathway out of the roost because they basically drop out and then start flying. So cluttered areas is difficult for them. Height, I couldn't give a height. It seems to be that they do -- there's not many roosts that are close to the ground but that may be because predators get them so we don't find many. So height is probably important for roost survival and the bat's survival.

Yes, the oldest trees in the landscape and the ones that are producing the knot holes, that's what it appears that the bats are looking for. And there's been a number of papers that are looking at those characteristics and that's why I was referring to that one in South Canterbury, in the Englinton as well, that only 1.3 per cent of the trees had characteristics that the bats wanted to use, and that's the emphasiser. Not just, "Oh, well, there's a tree right next door, looks okay. Why aren't they using that?" Well, they've got their own reasons why they're not but they aren't, and they don't choose

that. So it's very hard for us to ascertain what's a good roost and what isn't because of bats' complexity of choosing roosts it seems quite involved that we can't predict as well as we'd like.

**DR BORKIN:** On the rarity of roosts in the landscape in the Eglinton, that area that Moira was talking about with the quite low percentage of suitable roosts, it would be far lower in this landscape than other landscapes outside native forests.

**COMMISSIONER WASLEY:** So in terms of the note that in your statement in terms of the removal of the pasture, how do bats in your view use pasture areas?

**MS PRYDE:** So in my experience they're using the pasture as a commuting and a foraging area. So even in the Eglinton where the bats are living in national park they're going out of the national park and going across pastureland to the -- and there does seem -- there'll be different prey for them to feed on. So they're choosing to get out of the national park and go on along to the river ground which is further down the valley.

So the agricultural land is generally a commuting area but they will feed over grassland as well. And overseas bats feed on the grass grub beetle, the larvae that's in the pasture

grasses, so it's likely that our bats are doing similar thing over pasture.

**COMMISSIONER WASLEY:** So they land on the pasture and --

**MS PRYDE:** They feed in flight so they can -- they feed on the wing.

**DR BORKIN:** Can I comment on the -- in Hamilton. So in Hamilton they were feeding over pasture and under various -- they fly along the edges of any trees or around isolated trees in the pasture and foraging often quite extensive periods in those areas as well.

**MS PRYDE:** And from what Ian Davison-Watt(?) said of his observations he told me that at dusk the bats were going along the shelter belt, but then when it got darker they'd start moving across the pasture land.

**COMMISSIONER WASLEY:** So I'm just -- do both of you have Ms Tumai's legal submissions in front of you? If I can take you to page 17 of those which has a heading called "Conclusion", and she summarises the various measures that those of you have outlined in the evidence in chief to avoid adverse effects. So

they are going from (a) to (f). Is that a reasonably comprehensive summary of those matters or measures to avoid adverse effects in terms of bats?

**MS BORKIN:** Largely.

**COMMISSIONER WASLEY:** Okay. Anything of significance that is missing from that list?

**MS BORKIN:** The light levels, the suggestion of like there was in those areas and not considering those from residential properties I would consider to be and want to (inaudible) committed them.

There is only mention of replacement long-term of roosts (inaudible) suggests that they should be looking to replacement of roosts in the short term and medium term as well. As well as providing linkages throughout the site and that working well with the wider landscape.

**COMMISSIONER WASLEY:** So if I can just take you to (a) that notes the 100 metre butt on either side of the east-west shelter belt and just putting the riparian margin and gullies to one side for the moment, what is significant about 100 metres, vis-

à-vis 80 or 130 or whatever? Can you just tease that out a bit more for me please?

**MS BORKIN:** So this is based on research from Hamilton, that population, proof they are in Parsons 2017 and suggested that the probability of the presence of long-tailed bats increased from the distance to the street lights out to 100 metres. It's generally based on that.

**MS PRYDE:** In the Eglinton bats are on the edges of forests, the activity levels goes out to 200 metres and it tails off. So when you consider a bat is moving at maybe 50 or 60 kilometres an hour it can fly at a few metres of habitat is insignificant really so they need to be thinking big rather than getting concerned with adding a two, five or ten metres.

**COMMISSIONER WASLEY:** I think it was you, Ms Pryde, who mentioned in terms of there are outstanding matters across the relevant -- or the experts, the bat experts, what would you see as those key outstanding matters across the range of experts we have heard from and will be still hearing from tomorrow?

**MS PRYDE:** So the question of the width of the buffer, the use of the pasture land, the use of individual trees, the adequacy

of the current monitoring, or of the monitoring that has been done to date, would be my main concerns.

**MS BORKIN:** I was not involved in the previous caucusing but I have read the notes from that and it appears there's differences of opinion about the value of linkages across the landscape as well.

**MS PRYDE:** Yes, the significance of the roosts on site and whether they were solitary or communal and the importance of these roosts.

**COMMISSIONER WASLEY:** Thank you for that. Just turning to the last page of Ms Tumai's submissions and it is the last sentence where she notes:

"There needs to be a strategy protecting long-tailed bats that apprise on the proposal site and across the wider (overspeaking)."

Are you able to offer opinion of actually who should do that and is that something that falls within the purview of the Department of Conservation or others? The reason I ask this is that we have had a lot of evidence in terms of what should be undertaken in terms of addressing issues related to bats if the

subdivision was granted consent. I suppose there is always tension in that; is that all an applicant responsibility or is that responsibility somewhat wider? So I would just be interested if you are able to give any views around that matter.

**MS PRYDE:** Would you like to go first? I think there is a wider responsibility, definitely, and I do think that the Amberfield site is being caught in that position of what's happened in the past and what's going to happen in the future. We are at a little bit of a tipping point of where we go with these bats and whether we're are going to be able to look after them. So I feel for the applicant that they are caught in this but there had to be a time to say, how are we going to manage the bats in Hamilton, and I think it's a wider responsibility but Amberfield are within that as well.

**MS BORKIN:** Could I comment on that --

**COMMISSIONER WASLEY:** Yes, you may, yes.

**MS BORKIN:** I agree that there should be a wider strategy in the area so that ideas like linkages can be developed between different areas because if they are -- perhaps if they are

developed in isolation then they will not work as effectively as independently.

So, for example, if one area have developed the gully with lots of planting and the adjacent area did not and there were houses throughout the area then that would likely reduce the effectiveness in that area. I do not know that I'd like to comment on whose responsibility that is. I am sure there will be lots of disagreement on that but I do agree that it needs some careful thought.

**COMMISSIONER WASLEY:** But I suppose related to that is in respect of we have delegated authority to consider the proposal in respect of the Amberfield site. A range of witnesses, including yourselves, have talked about the east-west shelterbelt, the north-south and then potential connections into other parts of the Amberfield site but we cannot impose anything beyond generally the site. Fine, we may be able to do that in respect of say transport matters by imposing requirements on private property beyond the site and beyond what is applied for; we are quite severely limited in that process so that is just why I am interested in that wider (overspeaking)

**MS BORKIN:** I understand that and I understand that those are the reasons that have been given in the past where it is not occurring to date.

**COMMISSIONER WASLEY:** But does this really help matters?

**MS BORKIN:** No.

**COMMISSIONER WALSEY:** Okay. Commissioner Lovell, another question?

**COMMISSIONER LOVELL:** Just a couple on one small question. Just on the issue of roosts and trees and the comment around not necessarily finding roosts on lower levels due to predators. Is there an average height in what you would arrange in the height of the tree that you will expect to find roosts if it is ...

**MS BORKIN:** Moira might be able to answer this better from the Eglinton Valley but certainly there are still roosts that are open to the ground in the Hamilton area so large cavities that are open right from the base of the tree, up higher, but perhaps you can address that; the average height.

**MS PRYDE:** I can provide you with that but not right at this moment so I can do -- I can look at our database and come up with an average height of roosts from the data that we have.

**COMMISSIONER WASLEY:** Okay. If that can be provided to Mrs Guthrie and then she can make sure that gets circulated to all the parties.

**COMMISSIONER LOVELL:** And one more question and it is back to that that (inaudible) was talking about the extinct groups (several inaudible words) and you have noted that one was on the edge of the national forest. So what was on the other side of the forest so we can (inaudible) urban? Did it have an upper zone, what?

**MS PRYDE:** It was grazing land, grazing and arable and previously the grazing had gone right through the national park.

**COMMISSIONER LOVELL:** And so there was not a buffer zone or anything like that?

**MS PRYDE:** No.

**COMMISSIONER LOVELL:** Okay. Did you see the grazing land or anything having an impact on why they went extinct? Did it matter?

**MS PRYDE:** There is an association rather than direct evidence.

**COMMISSIONER LOVELL:** Thank you.

**COMMISSIONER WALSEY:** Commissioner Knott.

**COMMISSIONER KNOTT:** My question sort of leads on from that in a way where we have got the talk of this 100 metre buffer and then I have realised I am not really sure what a 100 metre buffer is. I know it is a 100 metres but what else does it consist of? What would you expect to be within the buffer?

**MS BORKIN:** That is another issue that appears to be under discussion as well. I have seen some images of recommended buffers from Europe and these consist of several areas of plantings and with a gap in the middle for that (inaudible). So it may not necessarily be just straight planting through that whole 100 metres. There might be planting, a gap in the middle, little planting and then another -- but that's just one idea that has come through from Europe.

**COMMISSIONER KNOTT:** So we have got two concepts of (inaudible) shown as part of the landscaping plans with the application, one being that area of open space that extends into the side of the river, which is from memory and (inaudible) the existing farm to boost that existing planting alongside the river to meadow space and some lines of trees and we also have a much smaller scale with the plantings being proposed for the -- around the east-west link and the extension of that really -- organisation of that, the so-called approved development, which again has existing trees, a narrow area of meadow and other trees so you get that sort of slot to the middle. Therefore, that landscaping we have seen, were they picking up on what you see, do you think?

**MS BORKIN:** Like, I've only seen the guidelines from Europe, I have actually seen them myself, but the mix of planting and some open areas might be useful for long-tailed bats given that they actually forage along an edge. That may provide them with an edge that is away from -- further away from lighting and cars and housing and that way it would be with a larger area of just straight planting throughout that whole ...

**COMMISSIONER KNOTT:** So the planting that we are seeing in the (overspeaking) maybe moving towards what you have seen but there is not -- you were putting these as "look at that further"?

**MS BORKIN:** Yes, I wouldn't think there was enough certainty at this point that is necessarily provided.

**COMMISSIONER KNOTT:** Okay, thank you.

**MS BORKIN:** Is that for now -- so your question --

**COMMISSIONER KNOTT:** No, that is good, yes, thanks, yes.

**COMMISSIONER WALSEY:** Okay. There is no further questions so thank you to you both.

**MS BORKIN:** Thank you for ...

**COMMISSIONER WALSEY:** We will adjourn for morning tea and reconvene at 11.15 for your new witness. Thank you.

(Adjourned until 11.15 am)

**COMMISSIONER WALSEY:** Okay, we will reconvene. Mr Riddell.

**MR RIDDELL:** The Director General's next witness is Dr Barea, who has already circulated a prepared statement of evidence. He will make his oral comments.

**COMMISSIONER WALSEY:** Okay. Thank you. Welcome, Dr Barea.

**DR BAREA:** Thank you. Yeah. So my name is Laurence Peter Barea. As Mr Riddell said, I prepared a statement of evidence. That was dated 23 April 2019 and it has been pre-circulated. I confirm that I have the qualifications and the experience set out in that evidence. I have no changes to my ultimate conclusions within that statement of evidence.

What I would like to do -- can I take it that you have pre-read my --

**COMMISSIONER WASLEY:** Yes, you can take that.

**DR BAREA:** -- my previous evidence. What I'd like to do is summarise from some draft notes that I have here. I apologise if it seems perhaps a little bit broken. Unfortunately, due to my illness we have not been able to get these to a point where I would read it verbatim. Anyway.

**COMMISSIONER WASLEY:** That is all right.

**DR BAREA:** Okay. Within my prime evidence I discussed the importance of and the application of the mitigation hierarchy. I don't propose to go into that in great detail now but I'm very happy to answer questions later if you have any but I just would like to just reiterate and emphasise that the application of that hierarchy; it's a fundamental process to reducing adverse effects so that either they don't exist or they are managed to a level that the residual adverse effects, if they exist, are small and manageable. That process is -- the framework that supports that was promulgated globally within the guidance developed by the business -- by the Biodiversity Offsets Programme to which DoC was a keen contributor.

Also the New Zealand Government Guidance on Good Practice Biodiversity Offsetting which I was a key author of and implemental of but also the Local Government Guidance on Offsetting at the RMA which has recently come out. I had a role there with the reviewing of that document that was produced in its final form.

So just to reiterate, avoidance is that first step in the process and it's the most important step from a biodiversity protection perspective. Something that sometimes goes amiss in people's understanding is that avoidance can happen at a whole range of scales. At one end of a spectrum it might involve avoidance of a whole site entirely but probably more commonly it involves avoidance of key ecological features within the site followed by minimisation at the other end of a continuum with an avoidance. So it doesn't necessarily mean we are avoiding a site but key elements within that site which obviously requires adequate work done to identify what those are.

So the applicant considers that the mitigation hierarchy has been appropriately implemented in order to achieve the best ecological outcome for bats and other ecological features. There is little or no data provided to support that assertion and I think if that could be applied -- and I understand the difficulties in doing that for bats given that there has been pretty much no work done in a mitigation of offsetting context around protecting bats and providing for gain, whether that is no net loss or something less than that available. That is one of the key areas around the uncertainty that exists around being able to mitigate well for the species and that's something

that's, you know, (inaudible) drawing from the expertise of our bat ecologists.

Okay, one of the things that I'm concerned about is the intention to provide management plans and the detail within those after consent might be granted. I know that it's quite common that some level of management plan preparation occurs after consent but it's usual that the details of which, including objectives and some of the drop out processes, will be provided for more substantially than what's been provided within deposited conditions. I think that that places too much risk on what is, as we all know, a national critical endangered species and I would like to see more of that but once I've -- currently concerned in that area with respect to the overall approach to addressing adverse effects.

Just with respect to offsetting and mitigations, it's an area that sometimes can be a confusion. So I just refer to the High Court in the Forest & Bird v Buller District Council and in that decision the court held that under the Act offsets are not a mitigation, so they're different things. The court found that:

"Rather the usual meaning of mitigation it refers to actions that alleviate, abate or moderate the severity of something. They do not address effects at the point of impact rather they are better viewed as a positive environmental effect applied elsewhere."

The High Court decision is helpful because that clarifies the distinction between mitigation and offsets and in an attempt to avoid confusion I just want to clarify that throughout my evidence I refer to mitigation using that differentiation. So, therefore, mitigation are actions that alleviate, abate or moderate the severity of impacts on the Amberfield site. Offsetting relates to positive effects that are applied elsewhere but are not part of this application for clarity.

Okay. One part of my evidence that received some comments was relating to paragraph 19.5 with respect to relying on the opinion of other experts. I'm not a bat ecologist so that's why I draw from our bat ecologists ecological views around bat ecology. However, what I'd like to point to in that paragraph - it's the last paragraph - on a section that deals with thresholds above which the likely success of managing adverse effects becomes highly uncertain and warrants a greater degree of attention. Risk assessments often called limits to offsetting are thinking -- in my personal view, or my expert view, they are equally relevant in considering compensation and

other forms of adverse effect management because in doing so it provides for a robust process in providing a level of confidence about the final outcome. So that's an area that if you have any further questioning around -- I've gone into some detail in my primary evidence but I think those are very relevant to this case given the status of the species, the knowledge we have around managing it particularly in the context of the application.

An area that I've found challenging to agree with was the differentiation between important and unimportant habitat that the applicant has made. In particular in the context of this application and the evidence that we've heard around the habitat quality and availability on the site but also within the landscape, particularly with respect to roost trees. Ms Pryde provided some evidence around the likelihood that a given tree that appears to have bat characteristics would actually be used by a bat and we know it's very small and in the context of this landscape the relative abundance of those large trees is low. So I find it hard to -- I would consider that all trees are therefore important along the lines of Ms Pryde and this relates to the avoidance principle within the mitigation hierarchy. The tree roosts that are known on site - I think two of those are not going to be felled anyway - but there is one roost on site

that's felled an area very close to it of similar vegetation that hasn't been surveyed which may contain roosts. I think these areas are important habitat because the bats are using them for their own reasons and there are limited resources within the environment so therefore the avoidance principle I think should be applying to those habitat features.

I disagree that residual adverse effects can be ruled out for this application and this relates to various values that are important for long-tailed bats and I'll just give you a couple of examples.

Currently it is considered that the bats, amongst other things, are commuting between the river and other parts of the landscape across to the west through the Mangakotukutuku Gully system. If any reduction in the ability of bats to commute across that landscape occurs then that's a residual adverse effect. It doesn't need to be all commuting loss but if it was reduced by a certain amount then that's a residual adverse effect.

So would be the assertion that there was a low risk of maternity roosts being lost. By making low risk assessment there's a possibility that there is some risk and if any

maternity or other roosts indeed are lost and aren't addressed then that also is a residual adverse effect. The same would apply for loss of pasture.

Ms Pryde gave evidence that bats are foraging over the pasture and commuting over pasture. The loss of pasture to construction results in a loss of some foraging habitat. Even though that foraging habitat might be assessed as being less important than other habitat types bats do forage there which means it's a resource which means it has some importance to the bats. The loss of that would be a residual adverse effect.

So would be the loss of commuting. One of the things that I don't think there's been enough emphasis placed on where there's some potential for mitigation of the uncertain outcomes is the connectivity to the habitats either side of the subdivision is a fundamental change to the landscape once the subdivision has been built and the change involves one that creates the least preferred habitat type as we see with Davidson Watt's report and other research in the area (overspeaking) so if that -- I don't consider that there has been enough application of the mitigation hierarchy to deal with that potential outcome within the design of the subdivision. That is an area where my opinion that some redesign of the provision

should occur. That's an area where there should be some focus in my view.

So that really relates to the ability of the bat to continue to use that landscape as they do now. Related to that and presenting a problem to the adapted management approach is the irreversible nature of the development and that's something that an adapted management approach needs to be able to consider because that approach would normally inform the design of something or decisions around design, the management of something. If that approach is taken at a later stage where a change has been made that can't be reversed then there are potential major challenges to being able to adaptively manage that situation and that's compounded where there are limited management options that are known to work so that's an area of concern that I have.

So I think I'll leave my summarising these notes at that point. Most of my evidence is in them - my primary evidence - and my conclusions remain the same and I'd be happy to answer any questions you may have.

**COMMISSIONER WALSEY:** Okay, thank you. Commissioner Knott.

**COMMISSIONER KNOTT:** So just looking at the sort of -- I cannot remember -- the process you talk about which is to avoid the mitigate offset and then sort of conversation. So hearing your summary when you are making your evidence in a way you are almost saying we are still at the consideration of avoid (inaudible) mode because you worked with that sort of -- it is just you sort of work with that process that the most important thing is to avoid and then the next is that is to only mitigation et cetera so you (inaudible). Do you still think in terms of addressing the real issues in relation to bats here in particular that we are still at that consideration to be avoided stage?

**DR BAREA:** I think that avoidance hasn't been fully considered and that's quite clearly evidenced with the intention to (several inaudible words) with the rest of the mitigation hierarchy which naturally flows from that I think still could improve the situation. In saying that I have to acknowledge Dr Borkin and Ms Pryde's evidence around -- and their personal views during questioning around the uncertainty of some of the proposed actions which -- such as planting corridors as to whether bats would use them in this kind of context. I don't think there too much uncertainty around whether to plant corridors and to effectively maintain them. Whether the bats

would use them in the right context and that includes where they have been placed and their spatial configurations, we don't know but that's an area that could be further worked on within the mitigation hierarchy in terms of some tweaking to the design.

**COMMISSIONER KNOTT:** But does that uncertainty regarding that issue go back to see whether further research is actually necessary? You know, because uncertainty about whether the mitigation will -- you know, is it always going to sit or you take avoidance as far as you can go, you then (overspeaking) mitigation and you have uncertainty about that so you have to then reconsider the avoidances? You sort of go through that --

**DR BAREA:** Well, there is -- that the concept for mitigation hierarchy framework doesn't obviously tell someone where to stop that process. It is an iterative process and an applicant will make a decision as to where they would stop. At that point any adverse effects that are left unaddressed become the residual adverse piece and the concept -- well, the reason why the mitigation hierarchy is so important is because it's there to prevent jumping too quickly to addressing residual adverse effects that are larger than they might need to be with uncertain management. So I would reiterate what Ms Pryde said

about it, it's important to retain what's there rather than manage it through uncertainty.

So with respect to, for example, establishing vegetated corridors that's a method where -- what that's trying to address -- it's trying to minimise such mitigation, it's minimising your data and adverse effect of having an urban landscape. Tied in with that could be a level of avoidance which relates to where urban landscape is created relative to what might be important to bats.

**COMMISSIONER KNOTT:** So in terms of the position we are in at the moment and there is talk about, you know, putting experts together again, what do you think they should be considering? Should they be further considering mitigation or do they step back to avoidance?

**DR BAREA:** I think both. I think the full mitigation hierarchy should be considered more.

**COMMISSIONER KNOTT:** No, that is it for me, thank you.

**COMMISSIONER WALSEY:** Commissioner Lovell.

**COMMISSIONER LOVELL:** Picking up on the point about limits and obviously it is -- and your comment that (Several inaudible words).

**DR BAREA:** Yes, that's correct.

**COMMISSIONER LOVELL:** Based on your experience do you have a view of what the limits would be in terms of this proposal, whether ecology or bats or anything like that in terms of what would you be looking at in terms of the limits?

**DR BAREA:** Well, the limits assessment can be applied to any values that are made in statements. I'm a little uncomfortable with addressing vegetation and other (overspeaking) values so I don't think I've put any critical limits there. But not for long-tailed bats because I think the issue lies within the interaction -- well, it's the specific nature of and the interaction between its threat status and the likelihood of success of management and then as the level of irreplaceability with vulnerability which, in this case, is reflected by the threat status. As that increases and the level of uncertainty or availability of management that's known to work in the right context also increases then the overall -- well, the limits to being able to manage adverse effects becomes critical and in

this case probably breached. Now, it doesn't lead one to conclude that a limit is reached just because something might be highly endangered because we have examples where threatened species can be managed so the options -- or the likelihood of success in those cases is much lower so therefore you'd have much more confidence. You know, kiwi might be -- we'll find that Brown Kiwi might be an example there but we actually know how effective (inaudible) on kiwi despite the threat status but not in this case. So I think that, yeah, that doesn't include -- you know, positions can still be made but I think in this case there is a limit to what can be achieved that has been based on information that we have.

**COMMISSIONER LOVELL:** So if we went ahead on that would your suggestion be -- what would the process be? Would it be reviewed on the basis of your plan, et cetera in terms of the mitigation that has been (inaudible), we would look at alternative options of mitigation or we could move to offset -- what is the normal process that would take whatever ...

**DR BAREA:** I think the most pragmatic approach that works with biodiversity is to go back to Fernwood Builders. That's all you can do. If you can't do something you need to avoid more and in this case something working it through the mitigation hierarchy.

I think there are still things that could be done in mitigation with respect to flight corridors but there is still some uncertainty to overcome that.

I think the biggest issue around a limit is changing that landscape to an urban one --

**COMMISSIONER LOVELL:** Well, that was my next question because the -- I think it was the people from RESI made the comment that if it does not work we cannot build our houses.

**DR BAREA:** That's my comment about the irreversible nature of this.

**COMMISSIONER LOVELL:** So are we, in effect, almost moving from mitigation straight to (inaudible) in this instance? I am asking because we have got a condition, I think 98, which talks of some foresight mitigation so I can be clear in terms of whether that would be the ultimate. So I am interested to know in this situation what do you think would be the most likely offset to take ...

**DR BAREA:** Well, I do think that it will be jumping too early to offsets because avoidance hasn't been -- it could be further

explored and things can be done and that -- so therefore I think it would jump too early to offsets and that's largely around that change in landscape in that landscape; it's such a fundamental change. So again I think a setback to further appointments is the next step.

**COMMISSIONER LOVELL:** One of the comments you made was about avoidance of key ecological sites in terms of minimisation. We have had some evidence put to us in terms of the gully being a key site in terms of planting and all those sorts of things. We also had evidence in terms of the shelterbelts as well and the buffering. Do you on the basis of this proposal have a sense of is there a hierarchy? Is it gully, shelterbelts, buffers, or do you have a sense of that in terms of your suggestion around ecology sites and then minimisation?

**DR BAREA (?):** I think the highest priority for dealing again with these sites are the sites that currently we know are being used. So obviously it is the (inaudible) and the shelterbelts and the vegetation along the river, which raises that question about are we going to need a buffer. We would at least have some work done on the species that supports that number, otherwise what number do you use for a buffer? So that has some support for it and I think it should be applied.

At the first level, it is those sites that are currently being used and then I would put that southern gully somewhat lower because although there are some detections there we do not know -- as Ms Pryde stated, the automatic bat detections do not really tell us much about behaviour. It is just there was a bat there.

It is possible that the intention to plant that up may be useful, but again I have to rely on the experts. We do not have that information, but the spatial configuration of it would be the key point. At the moment it is running north-south but it would need to plant towards the east to make connectivity across to the main development. There are some other considerations around that and I will have to rely on the bat experts around bat behaviour and likely issues.

**COMMISSIONER WASLEY:** Okay, thank you. Just turning to your comments about the provision of management plans and your concern that if consent was granted they would be provided after that event, is there in your view, for want of a better word, a halfway house that if we were minded to grant consent that one of the options could be to have a high degree of specificity of what would be in a management plan and the objectives,

et cetera? I would just be interested in your view on the approaches.

**DR BAREA:** I have been involved in other cases where that approach has been taken and we would typically state in the consent conditions objectives, quantified targets or performance measures that are critical to the outcome, and then some audit detail. The purpose of that is to really give some explicit points that those plans must cover and by a consent condition give surety to that. That is how we have kind of addressed that in the past.

Another way we have done is to work very closely with an applicant who has prepared a draft plan that still maps a lot of those types of details, and we work closely with them pre- and post-hearing to develop that.

In those cases, we had reasonable confidence in the management actions that were going to be used in those cases and that is how you can use specific numerical performance targets. For example, if it was pest control in a large forest, which was a recent one, we know that below 5 per cent residual tracking indices for possums is a target that actually produces a change

in benefits within the vegetation communities, that type of thing.

**COMMISSIONER WASLEY:** So just teasing that out a bit more, you suggest that one option is that collaborative approach to the development of a management plan.

**DR BAREA:** That has worked where the applicant is very willing to do that. I am not saying they are not in this case, but in those cases that is a fundamental necessity for that approach. It also would need an acceptance on both sides that there are methods that have enough level of confidence around them to achieve an outcome, that the workings around how much and where and when and those types of things are always necessary to produce the best likely or highest likely for that outcome occurring.

In a situation where there are not methods that are confident, then it becomes difficult to do that and that is unfortunately I think where we might be with this. We would all like to be confident about how to deal with problems but that is not reality. So I think that would require some further thought and discussion with the department's experts around the ability to do that.

I have had a very brief flick through Stuart Parsons' evidence in reply that came in last night and there is some content there that would feed into those types of discussions, so I can give a definitive view on whether that is an approach that I would be comfortable taking at this point. He definitely has some content here that needs some thinking about.

**COMMISSIONER WASLEY:** Thank you for that because we are hearing from him, too, later on.

**DR BAREA:** Yes.

**COMMISSIONER WASLEY:** Nothing further, so thank you.

**DR BAREA:** Thank you.

**COMMISSIONER WASLEY:** Mr Riddell, it is you.

**MR RIDDELL:** Yes. The Director-General's next witness is Mr Riddell.

**COMMISSIONER WASLEY:** We have your statement in front of us, this is your further statement, so over to you to take us

through that and where you feel that we can take things as read or summarise, feel free to do so.

**MR RIDDELL:** My name is John Andrew Riddell. I have prepared a statement of evidence dated 23 April 2019 which sets out my qualifications and experience. This is a further statement of evidence prepared after reading the evidence in reply of Mr Serjeant, Dr Flynn and Ms Cummings and the evidence-in-chief of Dr Flynn. I comment on the reliance on adaptive management, policy guidelines in respect of significant natural areas, and pest control. I would suggest that we can jump the rest, which is corrections and typos, through to about paragraph 9. Paragraph 6 starts under the heading "Adaptive Management" but the first little bit is just really setting out what is in the applicant's evidence and a new condition at paragraph 8, which is what is in Mr Serjeant's evidence in reply. At 9 I have just recorded the one objective, such as it is, that I can find for that management plan consequently for adaptive management.

So, at 10, my experience with adaptive management and resource consent applications includes giving evidence on the requirements for adaptive management in the Environment Court hearings on the application for tidal power generation at Kaipara Harbour, 17 Deep Shell Aquifer, Stewart Island aquifer,

water takes at Aupouri Peninsula. I have footnoted those cases and can provide those if you wish.

**COMMISSIONER WASLEY:** Thank you.

**MR RIDDELL:** In my opinion, the essential features for adaptive management are that the incremental stages of development are set out; the existing environment is established by robust baseline monitoring; there is clear and strong monitoring, reporting and checking mechanisms so that the steps can be taken before - and I have crossed out the word "significant" there - adverse effects eventuate. These mechanisms must be supported by enforcing resource consent conditions which require certain criteria to be met before the next stage can proceed and there is a real ability to remove all or some of the development that has occurred at that time if monitoring results warrant it.

Just in essence, the adaptive management is increasing by stages, whereas with this application it is almost the reverse of that. There is a lot of work done and then you find out what the effects are. For example, the site earthworks are quite extensive in terms of vegetation where it is not incremental in the sense that adaptive management, as the technique that has been discussed through the courts, anticipates.

I consider that the adaptive management technique is best suited to development and resource use where the actual potential impacts are reversible. This is because our basic position with adaptive management is that the scale of development or resource use depends on monitoring results, including where the monitoring results show there is a need to scale back the development and resource use if scaling back is not likely to result in a recovery of the resource and effect the environment. In other words, if the effects are not likely to be reversible then the basic proposition behind adaptive management cannot be met. It follows that the adaptive management technique would not be appropriate in that instance.

In my opinion, adaptive management as proposed by the applicant is not appropriate or in accord with the common understanding of adaptive management that I have set out above. Then the reasons for my conclusion include the limited baseline monitoring with respect to long-tailed bats, a monitoring regime is yet to be developed, proposed consent conditions require it to be provided some time after the consent is granted, the lack of quantified criteria to trigger the use of adaptive management, the use of the proposed consent conditions to defer this until after the consent is granted, the difficulty of

scaling back on development after the consent is granted, the potential for adverse effects on long-tailed bats to be irreversible, and the overall policy guidance that effects on long-tailed bats and its habitat should be avoided, not mitigated, by using adaptive management.

Just one of the questions that you asked Dr Barea was about management plans and in my experience and certainly in those two cases that I have referred to, with adaptive management there were draft management plans prepared before the application was heard. A lot of the discussion and a lot of the Environment Court's decisions in those cases was modifying or identifying how those management plans would be amended. So rather than the composition that a consent condition will set out these are the objectives, these are the measurement measures, produce a management plan at a later date. In these cases, particularly where there was significant resources potentially at stake - in the case of Crest Energy, Kaipara Harbour has 5 per cent of the snapper spawning for the West Coast; tidal generators in the harbour mouth, it was uncertain what the effect was; in the case of the water take in the Aupouri Peninsula it was the effect on the Kaimaumau wetland, which was identified as the second most significant wetland in Northland - the draft management plans were provided in advance.

Significant natural areas: I think this is a matter that has been fairly well rehearsed through the evidence and further evidence that there is a difference between myself and Mr Serjeant. I suppose the main point that I want to make out of that is just around probably paragraph 20. I think that this is a difference of policy opinion which is being fed back to the ecologists in terms of what they should be looking for. I suppose I would say there that further caucusing with, "This is the policy environment you are working in" would be more beneficial than it not having that guidance.

Okay, so pest control. At paragraphs 32 and 33 of her primary evidence, Dr Flynn discusses predator control. She expresses scepticism about the efficacy of prohibiting domestic cats given that there are feral cats in the vicinity. She appears to consider in effect a bylaw would be necessary to prohibit cats in relation to -- and then also makes comments in relation to pest control over the whole property, which is an extract that is quoted at the top of page 8. She favours a collective, co-ordinated and large-scale effort across a large area sometime in the future.

Based on my experience with pest control and no cats and dogs conditions with subdivisions, particularly in Northland, I consider that the difficulties of pest control on the Amberfield site are being overstated. It is, in my experience, common for there to be subdivision consent conditions prohibiting cats and dogs anywhere in the Far North district, for example, where the site is identified as being within a kiwi concentration area. This is applied consistently as properties are subdivided, so over time the extent of high concentration kiwi habitat where cats and dogs are prohibited has increased.

I see no reason why something similar could not occur here if keeping of cats on any lot in the Amberfield subdivision was prohibited by a consent condition. I would expect that a prohibition on the keeping of cats in order to protect long-tailed bats would over time extend to other properties within the Peacocke structure plan area and beyond within the long-tailed bat habitat as these are subdivided. The nature of subdivision is that it happens spasmodically over time and there are no dogs and cats conditions in, for example, the kiwi habitats. It started as one property, then as people subdivide the area that has no cats and dogs increases and the benefits to kiwi increase over time as well. So, it is something that you are probably looking at a 20 to 30-year timeframe before you are

getting any good results, depending on how much subdivision occurs.

It is also not unusual for pest control in perpetuity to be imposed as a consent condition on what I call management plan subdivisions. These subdivisions include properties of a similar size to Amberfield and larger where infestation is prevented by paying particular attention to the pest control along the borders of the site. That is technical advice that talks about what is suitable there.

It does have implications when you are imposing such a condition across a subdivision that is going to end up with 800 or 835 fee simple titles in that financing or funding or resourcing a continual pest control programme does require some sort of owners' association. The options go basically you can go from an annual payment by each landowner to, at the other end, as the subdivision proceeds, a trust or a bank account is set up and the numbers are drawn down from that. It does require consideration which is much wider than just an individual property owner's consideration.

I just say in my experience in some cases as neighbouring properties undertake similar subdivision or property owners

decide to reinstate indigenous habitat, individual pest control areas join up. There is no reason to expect something similar could not occur here over time across the Peacocke structure plan area. In that regard, there is a structure plan area that this is part of, so I think the fact that there is a structure plan area helps in terms of potential future expansion of any measures that happen on the site in that regard, pest control and cat prohibition.

Thirdly, I just make a comment that there is also potentially another issue, which is that parts of the riparian margin, maybe the Hamilton City Council controlled, there may need to be some sort of arrangement there if we do not have an efficient pest control regime.

Just finally, just picking up on another question that was asked earlier about who is responsible for the wide area management of long-tailed bats, I think in this case we have a structure plan which I understand is under review and there is a strong element or a strong opportunity in there to increase the area that is -- or introduce policies and provisions into the structure plan directly addressing long-tailed bat habitat and its protection. That is not something, clearly, that this panel is able to do, but it does point to one of the I think

relatively significant areas of who is responsible, is that district councils or city councils through their district plans is a potentially viable instrument, obviously outside the power of a hearing panel.

**COMMISSIONER WASLEY:** Thank you. Questions, Commissioner Lovell?

**COMMISSIONER LOVELL:** Nothing from me.

**COMMISSIONER WASLEY:** Okay. Commissioner Knott?

**COMMISSIONER KNOTT:** Can I just pick up on a couple of those points near the end of that first statement and the issue of pest control? You said it would require a residents' association but there would be significant areas of land which I assume post-development would be in public ownership, which would include the riparian margin, the areas of reserve, the streets, and all the other reserve areas, so public management of that would actually pick up quite a large area.

This may be a technical question which you cannot answer. I am just wondering whether individual lots and the development on individual lots could be designed in such a way that they did

not necessarily support pests. For instance, depending upon the planting that is allowed, et cetera, I am just wondering whether that might be the easier way than having a residents' association. I know, of course, we have heard over Riverlea that residents were very involved with pest control anyway and it works well there. I am just wondering whether there are other ways. Am I correct in thinking that all the vast areas of reserve, et cetera, would be publicly managed in terms of pest control, and are there other ways of managing pests within individual lots rather than active day to day pest management, as it were, through urban design?

**MR RIDDELL:** The alternative ways of managing pest control are outside my pay grade. The issue is: is it better to have it integrated across the whole site and riparian area, pest control under one management, or to have a number of different people doing pest control without -- as best they can? I think the reasoning behind pest control across the whole properties in other applications I know where that has been required as a consent condition is that it is more efficient. It is one person or one body responsible for the pest control or predator control who manages it to that one standard instead of having a number of different people, landowners, that do not have standards.

**COMMISSIONER KNOTT:** That makes sense, thank you. In terms of the dogs and cats condition, in terms of the subdivisions, et cetera, that you were talking about where you have seen that happen, are they things of the scale that we are looking at here? The reason I ask that is the issue of monitoring. I guess it might be found that it is self-monitored in terms of neighbours telling the council, but any thoughts about scale and future monitoring?

**MR RIDDELL:** The experience with dog and cat prohibitions -- and this time I am only being clear from the advice from the bat experts it is only cats that are of concern. Prohibiting keeping of pet cats and dogs is a pretty draconian measure so, therefore, should only be used when there is really the justification. In Northland and Auckland it is the continued presence of North Island brown kiwi specifically is the reason, and here it is for long-tailed bats. The experience is that most of the monitoring and enforcement occurs because neighbours complain.

There are a couple of other things that happen. One of them is that where you are in a subdivision which you know has prohibited cats and dogs and you see a cat or a dog and you are

a council officer, you make enquiries. The third one is that people who move into that subdivision because of the no cats and dogs actually continue to advocate for that as well outside of there as well but (inaudible). With dogs there is the potential for better monitoring because dogs are registered. So if you are getting someone registering a dog from a lot that you know is no dogs, there should be a trigger coming up on the screen. With cats they do not register them yet.

**COMMISSIONER KNOTT:** No. Okay, that is helpful. Thank you.

**COMMISSIONER WASLEY:** Mr Riddell, taking you to page 7 of your further statement, you discuss the differences over policy guidance, particularly from paragraphs 18 to 20. You noted that in terms of any further caucusing it should be within the policy context. So in terms of that policy context, are you specifically referring to those matters you have outlined in paragraph 18?

**MR RIDDELL:** My opinion is that the policy context in relation to the long-tailed bats and their habitat is that there should be an avoid adverse effects regime. I think that comes through section 6(c), the regional policy, and the district plan having

a number of policies which are not explicitly -- this only applies within a Significant Natural Area.

With the regional policy statement, policy 11.2, I think it is method 2 under there, it basically says avoid as much as possible and then follow the mitigation hierarchy, but then it has another one that says you should not follow the mitigation hierarchy, it is not always appropriate to follow the mitigation hierarchy because of -- if you give me a minute I can find the exact words.

**COMMISSIONER WASLEY:** Yes, thank you.

**MR RIDDELL:** It is method 11.2.2, clause (f), recognise that remediation, mitigation and offsetting may not be appropriate where indigenous biodiversity is rare, at risk, threatened or irreplaceable.

**COMMISSIONER WASLEY:** Thank you. I do not have anything further, so thank you, Mr Riddell.

**MR RIDDELL:** I will now jump back to a different hat.

**COMMISSIONER WASLEY:** Yes.

**MR RIDDELL:** That is the case for the Director-General subject to any comments on this morning's early circulation of the evidence in reply by Dr Parsons, and we are waiting for a direction as to whether it is possible to provide something in writing within a week or so.

**COMMISSIONER WASLEY:** Yes.

**MR RIDDELL:** And noting further that there is further ecological caucusing to occur. I am not sure what ...

**COMMISSIONER WASLEY:** Yes. The panel will be having a discussion around that this afternoon. We have one more witness to hear and that was the tangata whenua submission, Mrs Guthrie. So are we looking at sitting them at 2.00 pm?

**MRS GUTHRIE:** Yes.

**COMMISSIONER WASLEY:** Okay. Then the panel will be meeting to consider and make determinations in respect of caucusing. There are a number of matters we need to give consideration to and I do make the point that also today's evidence and legal submissions have been helpful as part of that process.

**MR RIDDELL:** What should the three Department of Conservation ecological witnesses be thinking about what they are doing tomorrow?

**COMMISSIONER WASLEY:** That is what the panel are gathering to actually discuss because there are a number of matters related to the caucusing. That is why we want to do that early afternoon so we can get that advice out.

**MR RIDDELL:** That will come out through the emails?

**COMMISSIONER WASLEY:** Yes, Mrs Guthrie will be able to circulate that.

**MR RIDDELL:** Very good.

**COMMISSIONER WASLEY:** I appreciate in terms of the timing of that but also these matters have been unfolding during the course of the hearing and certainly the panel discussions late last week that we have had were wanting to make sure we also had the input from witnesses today, notwithstanding we also have Dr Parsons tomorrow. Thank you.

**MALE SPEAKER:** Excuse me, sir. I am sorry for interrupting (several inaudible words).

**COMMISSIONER WASLEY:** That is all right.

**MALE SPEAKER:** I wonder, given that counsel for the Department of Conservation is sick, whether Mr Riddell might be included on the email list so at least it is going to someone with DoC. (overspeaking). He has been told to let the ecologists know what is happening tomorrow?

**COMMISSIONER WASLEY:** Yes. That is certainly no issue with that.

**MALE SPEAKER:** Thank you, sir.

**COMMISSIONER WASLEY:** We are just hopeful no more legal advisors go down with the lurgy. (overspeaking)

**MALE SPEAKER:** I certainly will. I thought the scarf was perhaps an ominous sign.

**FEMALE SPEAKER:** It is protection.

**COMMISSIONER WASLEY:** So on that note, we will adjourn until 2.00 pm and then we will hear in terms of the next submission and I think Mr James Gardner-Hopkins is attending for that.

**MRS GUTHRIE:** Yes.

**COMMISSIONER WASLEY:** So, we will adjourn until 2.00 pm. Thank you.

(Adjourned until 2.00 pm)