

**BEFORE THE INDEPENDENT HEARING COMMISSIONERS**

**IN THE MATTER** of the Resource Management Act 1991 ('the Act')

**AND**

**IN THE MATTER** of the Proposed Canterbury Land and Water Regional Plan

**BETWEEN** **RAYONIER NEW ZEALAND LTD**  
Submitter

**A N D** **CANTERBURY REGIONAL COUNCIL**  
Local Authority

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**EVIDENCE OF DR BRENT COWIE ON BEHALF OF RAYONIER NEW ZEALAND LIMITED**

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## INTRODUCTION

- 1 My full name is Brent Cowie. I hold the degrees of Bachelor of Science with Honours and a Doctorate of Philosophy in Zoology from the University of Canterbury, where I specialised in freshwater biology.
- 2 My doctorate thesis was on the ecology of stream invertebrate communities in a West Coast beech forest ecosystem. I also studied freshwater quality and fisheries while at University. I have authored or co-authored seven publications in peer reviewed scientific journals.
- 3 I have 30 years experience in resource management in New Zealand. I have worked as a private consultant, as a Fisheries and Wildlife Consultant for the former North Canterbury Catchment Board, as a Scientist for the Water and Soil Directorate of the former Ministry of Works and Development, and as a Senior Analyst for the Ministry for the Environment. I was Group Manager Resources at the Manawatu-Wanganui Regional Council from September 1989 to June 2001. In this role I was responsible for all the resource management functions of the Regional Council.
- 4 In 1997 I was the NZ representative on an International OECD team that undertook an Environmental Performance Review of Australia. Such reviews are undertaken of each OECD country about every 5-10 years. I was responsible for reporting on land, water and coastal management.
- 5 Since 2001 I have been a resource management consultant. In that role I have undertaken numerous technical tasks and hearing commissioner roles.
- 6 The technical roles have included: preparing a monitoring and reporting strategy for the Dairying and Clean Streams Accord; carrying out a review of the hearing process for the proposed TrustPower hydro scheme on the Wairau River; carrying out work on how central government, local government and industry viewed decision making on science priorities, reviewing consents processes in each of Auckland and Hawke's Bay regional councils, being one of two reviewers of the consents processing performance of the Far North District Council, and drafting resource consent applications for two proposed Meridian hydro power generation projects in North Canterbury.
- 7 The hearing commissioner roles have included applications for three hydro power schemes (Arnold River, Matiri River, a small scheme in Golden Bay), two water conservation order applications or variations (Oreti River, Lake Ellesmere), two major air discharges (Ravensdown Fertiliser at Hornby and Awatoto), a medium sized irrigation scheme (Rangitata South), numerous wastewater discharges (e.g. Westland Milk to the Hokitika River, Fonterra marine discharge at Clandeboye; Rangiora sewage, Kaikoura sewage) and other large scale developments (e.g. Stage 2 of the new Fonterra factory at Darfield). I have written or co-written all of the decisions on these applications.

- 8 I chaired the panel and wrote all decisions (about 6,000 of them) on Chapters 4-8 of the Canterbury Natural Resources Regional Plan (NRRP). The matters covered were water quality, water quantity, beds of lakes and rivers, wetlands and soil conservation. Accordingly I am very familiar with the previous regulatory framework for resource management in the Canterbury region.
- 9 Although this is a Council hearing, in preparing my evidence I have reviewed the code of conduct for expert witnesses contained in part 5 of the consolidated Environment Court Practice Note 2011. I have complied with it in preparing my evidence. I confirm that the issues addressed in this statement of evidence are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

#### **SCOPE OF EVIDENCE**

- 10 In my evidence I address the following issues:
- 10.1 The process used to develop the NRRP
- 10.2 The hearings on the topic of forestry and water yield
- 10.3 The hearing committee's deliberations on this topic
- 10.4 The approach in the proposed Land and Water Regional Plan (the pLWRP).
- 11 In preparing my evidence I have read the relevant parts of the pLWRP and the Officer's Report, and the evidence of the following witnesses:
- Mr Kelvin Meredith; and
  - Mr Nick Boyes.

#### **SUMMARY OF POSITION**

- 12 The controls on forestry in flow sensitive catchments in the pLWRP returned to the arbitrary and non effects based approach in the NRRP as proposed. This was despite extensive submissions from the forestry industry, and NRRP commissioners spending considerable time and energy developing an effects based approach.
- 13 Both the proposed NRRP and the pLWRP rely on per property (or title) limitations on forestry in "flow sensitive" catchments. This is irrespective of the size or location of the property in such a catchment. This is simple and efficient to administer, but is not effective as it does not target the effect that is being managed – retention of flows in sensitive catchments. In my view s9(2) RMA land use controls should focus on effectiveness, particularly as this is consistent with the functions of regional councils under s30(1)(c) of the Act.
- 14 I agree that large scale forestry in some catchments in Canterbury could have significant adverse effects on flows, instream values, and downstream users. For

this reason I consider that well targeted regulation controlling the effects of forestry on water yield are appropriate.

- 15 NRRP commissioners focussed on effects in two ways. First, the only catchments subject to regulatory control were those where forestry could reduce 7dMALF by more than 5%, and/or average annual flow by more than 10%. This meant only nine catchments in Canterbury were subject to restrictions on forestry in the Operative NRRP. Restricted discretionary consents would be required if either of these thresholds were exceeded over time in these catchments.
- 16 In practise protecting 95% of 7dMALF means there are fairly strong restrictions on afforestation in headwaters, as this is where baseflow is generated. However the requirement to protect 90% of average flow places less restrictions on forestry in the balance of the catchment.
- 17 About another 20 catchments have been added to the nine individually specified as flow sensitive in the NRRP. I am unclear what criteria were used these catchments, but do note that many of them are small. In my view the same criteria should have been used as for the nine catchments specified in the Operative NRRP.
- 18 The Officer's recommendations regarding Rule 5.110 is a significant improvement over that rule in the pLWRP as notified, and goes some way to meeting my concerns.
- 19 However in at least larger catchments (of over 20km<sup>2</sup>) I remain strongly of the view that an effects based approach to forestry is essential in flow sensitive catchments. Both the instream environment and resource users deserve no less than well targeted regulation aiming at the effect being managed. In smaller catchments, I can see advantages in a more administratively efficient approach consistent with changes recommended by the Officers.

#### **THE NRRP PROCESS**

- 20 The NRRP involved an exhaustive process.
- 21 It took 10 years from enactment of the RMA in 1991 for Environment Canterbury to release a draft plan covering land and water management in the region in 2001. That draft plan received wide submissions. At that early stage the topic of forestry and water yield was proposed to be a separate chapter of the plan, which indicates how important at that time ECan thought this issue was.
- 22 Variation 1 (Chapters 4-8) of the Proposed Natural Resources Regional Plan was notified on 3 July 2004. The five chapters covered water quality, water quantity, activities in the beds of rivers and lakes, wetlands and soil conservation. The issues associated with forestry and water yield were by now incorporated into Chapter 5 of the proposed Plan.
- 23 Six hundred and seventy-one parties made submissions to the proposed plan. The Summary of Decisions Requested was notified on 15 October 2005, with 92 further

submissions received. In total there were 62,018 submission points on which decisions had to be made, of which 37,706 were original submission points and 24,312 were further submission points.

- 24 On 25 June 2006 Environment Canterbury appointed six commissioners to hear and decide the submissions to the proposed NRRP. I chaired the two hearing panels; the other five commissioners were all elected councillors. Panel 1, which considered Chapters 4 (water quality) and 5 (water quantity, including the effects of forestry on water yield) of the Proposed Plan comprised myself, and Councillors Bill Woods, Bob Kirk, Mark Oldfield and Robert Johnston. Panel 2, which considered Chapters 6 -8 of the proposed plan, comprised myself, and Councillors Oldfield, Johnston and Anne Carroll. Anne suffered from a stroke about a year into the hearing process and took no further part on Panel 2.
- 25 The councillors who were appointed to the hearing panels simply volunteered for the task. So it was only by luck that we ended up with a good balance on the panels. There was one extensive farmer from Waimakariri District (Cr Johnston), one intensive farmer from Timaru District (Cr Oldfield), a former Mayor of the Selwyn District and resident of a small town there (Cr Woods). Both Professor Kirk and I dwell in Christchurch. He is one of New Zealand's leading physical geographers, and as already noted my training is primarily in aquatic ecology.
- 26 We started hearing submissions in September 2006 and completed them, after 71 hearing days, in June 2009. One small matter was heard in June 2010. In all it took 59 months from the notification of Variation 1 on 3 July 2004 until the hearings were completed on 2 June 2009. There were 34 separate hearing stages and officer reports directly related to those hearing stages totalled over 7,700 pages. The report on water yield and forestry, which was Officer Report 13 (OR13), was about 250 pages. While the officers recommended some significant changes to the Objectives, Policies and Rules, they continued to advocate for the regulatory approach in the proposed NRRP.
- 27 Our decisions on submissions were released in October 2010. There were six appeals to the High Court which were resolved by negotiation, and Chapters 4-8 of the NRRP became operative in May 2011.

#### **HEARINGS ON FORESTRY AND WATER YIELD**

- 28 The hearings on Forestry and Water Yield took place on 17, 18 and 20 September 2007. The hearings covered an Issue, Objective, Policies and Rules on this matter. These are now Issue WQN2, Objective WQN2, Policies WQN5 and WQN6 and Rules WQN27 and 28 of Chapter 5 of the NRRP.
- 29 The main submitters to that hearing styled themselves as the "Joint Forestry Submitters" (JFS), who constituted the Selwyn Plantation Board Limited, Matariki Forests, Blakely Pacific Limited, the NZ Forest Owners Association and the New Zealand Farm Forestry Association. They were represented by Mr Fowler and called

eight witnesses on topics varying from hydrology to soil conservation, economics and planning. I understand that the statements of evidence presented by the JFS witnesses at the NRRP hearing are attached to the evidence of Kelvin Meredith which has been filed together with my evidence by Rayonier New Zealand Limited.

- 30 The Joint Forestry Submitters were strongly opposed to the regulatory approach in the proposed Plan. Essentially this approach involved future restrictions on forest planting on a per property basis in 59 catchments in the region. These catchments were divided into four groups; depending on their sensitivity. Resource consents would be required if new plantings occurred on more than 5, 10, 15 or 20% of any given property.
- 31 In the proposed NRRP restrictions were only proposed on the nine catchments listed at that time in Schedule WQN15. However a further 50 catchments were listed as "flow sensitive" in Appendix WQN4. My hand written notes indicate that not all these catchments would likely be included in Schedule WQN15 as flow sensitive, but that other catchments could be added, particularly in the north of the region where no analysis had been carried out in catchments like the Conway.
- 32 The restrictions on the nine catchments listed in Schedule WQN15 of the proposed NRRP were by way of per property basis which triggered a restricted discretionary activity in Rule WQN47. Ten matters were listed that discretion was restricted to, but some of these were so broad that the activity status was effectively close to fully discretionary.
- 33 This same approach is included in the pLWRP, albeit fashioned in a simpler way with restrictions only applying if more than 15% of a property is planted. This is via Rule 5.111, which is also, at least nominally, a restricted discretionary activity. Restriction of discretion 5 is very broad, and the effect of Rule 5.4 is that financial contributions and bonds are also matters to which discretions is restricted.
- 34 The Officer's Report has recommended some meritorious amendments to the approach in the notified plan. I comment on this in Paragraphs 59-65 below.
- 35 The JFS advocated for an alternative approach, which would focus regulation towards the "low flow producing area" of any given catchment. This is the higher ground where much of the baseflow is generated. The JFS argument was in essence that the "per property" restrictions were not effects based, and that this approach was weighed against their interests. These interests could either buying large properties for conversion to forestry, or "forest farmers" converting large parts of a property to forestry, as they could not be assured of being granted consents for forest establishment on that basis.

#### **THE COMMITTEE'S DELIBERATIONS ON OR13**

- 36 It is fair to say that no issue divided the hearing panels as much as did the topic of forestry and water yield. This was primarily because Commissioner Johnston was

adamantly opposed to any such regulation, and he kept returning to this view repeatedly.

- 37 My recollection is that we spent about six days deliberating on these matters and OR13.
- 38 The way we undertook deliberations was that I would prepare an initial memo for the panel in which we would discuss the major issues in any particular Officer Report. I would offer comment or make recommendations, so we could then proceed to more detailed discussions and decisions.
- 39 The first of my memos on OR13 was dated 21 February 2008, and is attached at **Appendix 1**. My hand written notes on my copy of the memo indicate that four of the five members of Panel 1 agreed that it was necessary for the NRRP to have some regulatory control over the effects of forestry on water yield, but if that were to occur, we all believed it should be along the lines advocated by the JFS rather than the “per property” approach advocated by officers.
- 40 There then followed a sequence which included some further evidence from the JFS, staff reports as to why they thought such approach was not practical, technical reports from NIWA to satisfy our questions, and further panel discussions. I need not detail all that here. It is covered fully by **Appendix 2**, which is taken directly from the summary overview of our decisions on the NRRP. In that Appendix we described this process as follows:
- The first additional analysis undertaken looked at controls on forestry on the basis of a number of isohyds drawn across flow-sensitive catchments. We used these to look at different levels of threshold control on forest planting as a permitted activity. While the analysis used gave us much additional information on which we could base our final decisions, this approach was cumbersome and administratively uncertain for landholders, and would be difficult to interpret and enforce.*
- 41 The two key decisions we made were:
- 41.1 Any restrictions should apply **only** to those catchments where forestry could affect the 7 day Mean Annual Low Flow (7dMALF) by more than 5%, and/or the mean annual flow by more than 10%. This was firstly to meet Environment Canterbury’s duty to protect the life supporting capacity of water under s5(2) of the RMA (retain at least 95% of 7d MALF), and secondly to protect the rights of other downstream users (90% of the average flow). By applying these criteria the 59 catchments listed as potentially “flow sensitive” in the proposed NRRP reduced in number to nine in the Operative NRRP. These were the same nine catchments listed in Schedule WQN15. In the other 50 catchments my understanding was that more extensive forest plantings would not trigger either of the effects based thresholds we considered appropriate before controls should be exercised.

- 41.2 We decided that in these nine catchments controls should be imposed on the basis of protecting the 95% MALF and the 90% average flow. Consents would be required if any new forest plantings would cumulatively exceed either of these thresholds. This required detailed mapping of each of these nine catchments; these maps are included in the map volume that accompanies the NRRP.
- 42 There were two practical ramifications of this approach.
- 42.1 As noted earlier, most of the baseflow in a catchment is generated from the headwaters which lie at the highest altitude, and which consequently have the highest rainfall. This baseflow provides for the 7dMALF component. As we decided to protect 95% of 7dMALF, consents were required if little additional planting took place in this area of each of the nine catchments.
- 42.2 The average flow is however generated from the wider catchment. Restrictions to protect 90% of this flow were therefore less restrictive, but were spread over a much greater part of each of the nine catchments.
- 43 It is likely that in the nine flow sensitive catchments listed in the operative NRRP that much of the low to mid altitude land that could be economic to convert to forestry would be too summer dry to make this worthwhile. So any forest planting is likely to be on the higher ground, where restrictions to protect 7dMALF are more likely to be triggered versus any significant reductions in average flows.
- 44 In a similar context Appendix WQN2 of Chapter 5 of the NRRP listed about 12 pages of minimum flows in catchments around the region. Most of these dated back to the 1990's, but nine went back to the 1970's, with the oldest being for the Halswell River set in 1972. In evidence Fish and Game told us that many of these flows were set at less than 7dMALF, although we did not investigate this further as we made the pragmatic decision not to review any of these flows. Assuming what Fish and Game said is true, many of these minimum flows have long been set lower than the 95% of 7dMALF standard that we set to protect sensitive catchments from the effects of flow on water yield.
- 45 In our decision overview we summarised the merits of the approach to management of flow sensitive catchments as follows:
- This approach has some strong advantages. It promotes the sustainable management of water resources by protecting life supporting capacity. It also offers significant protection to existing users while allowing landowners reasonable use rights on their properties. As such, it is effects based, transparent, and we believe equitable. It will provide for the sustainable management of water yield in flow sensitive catchments on robust and defensible grounds. It also provides certainty for land owners wishing to undertake significant forest plantings on their properties in the flow sensitive catchments.*



*We acknowledge that this approach is not perfect. It relies on detailed mapping of the catchments, which has now been completed. It also allows an element of "first in first served" in terms of land owners taking up the planting of forests to the thresholds established. But this is far better than the arbitrary limitation of planting to a limited amount per property over an entire catchment. We would also note that much of the "balance" area in these catchments may well be too summer and autumn dry to sustain forest plantings, so the thresholds in these areas may not be reached in the longer term unless the comparative economics of forestry versus farming on hill country change significantly. This may occur partly as a consequence of the new Emissions Trading Scheme.*

- 46 I largely stand by those same words today. I do however acknowledge that detailed mapping of the hydrological characteristics of catchments could be expensive, and that in at least small catchments some efficiencies can perhaps be provided for.
- 47 The only consent application that I have been made aware of to plant trees in a flow sensitive catchment was granted to Button Logging Limited on 9 November 2011. The consent was to plant up to 770ha of pine trees at mid altitudes on farmland in the Waipara Catchment, and was for a controlled activity under Rule WQN28 of the operative NRRP. There are six conditions of consent, four of which are primarily administrative (e.g. a review condition, a lapsing condition, notification prior to the consent being exercised). The other two conditions specify where trees can and cannot be planted.
- 48 The AEE provided with the application is comprehensive. An associated assessment carried out by NIWA showed that effects on flows would be small. NIWA estimated that the proposal would reduce 7dMALF by only 0.0001%, whereas mean flows would reduce by 0.54%, which is 26.6 litres per second. This is because the proposed planting was outside of the higher altitude parts of the catchment that produce the baseflow. In my view this shows how the NRRP rule can work well in practise.
- 49 Subsequent to decisions on the NRRP I have sometimes cast my mind back to "what I might have done differently" with the wisdom of retrospect. The only change I would make to the NRRP decisions on forestry and water yield is to the average flow regime, where a more effects based approach would be to protect the 90% average flow in the drier months, as that is when downstream users are more critically reliant on water. But this is not an approach that any of us thought of at the time of deliberations on the NRRP.

#### **THE APPROACH IN THE pLWRP**

- 50 There is much to like about the pLWRP compared to the operative NRRP. It is a much more compact, simple and user friendly document. I am particularly impressed with the way the Activity and Resource Policies and associated Rules

have been drafted. These are far simpler and much more user friendly than in the NRRP.

- 51 However when I read the section on Forestry and Water Yield in the pLWRP it dismayed me that ECan had returned to what I consider the discredited regulatory approach in the NRRP as proposed. This ignored the views of the JFS submitters, their detailed evidence to provide alternative suggestions, and our careful deliberations.
- 52 On further examination I was also dismayed that ECan had perhaps also ignored the criteria we spent much effort working on regarding what is a "flow sensitive catchment". While it is not possible to make direct comparisons in all cases given the incomplete nature of Sections 6-15 of the Proposed Plan, Section 10 on Banks Peninsula is instructive. Only one stream (French Farm Stream) on the Peninsula met our 95%7d MALF and/or 90% average flow criteria, yet the pLWRP lists 12 streams there as being "flow sensitive".
- 53 The Officer's Report does speak of additional research and investigations being carried out to identify "flow sensitive catchments" (pp300), but does not describe what was done or what criteria were applied.
- 54 Certainly however many of the additional catchments listed in the pLWRP as flow sensitive are quite small. This is the case for instance for all the catchments listed on Bank's Peninsula. Because of this, I do not envisage many of the additional catchments listed to date in the pLWRP as been of great interest to Rayonier.
- 55 What this does indicate however is that once Sections 6-15 of the pLWRP are completed, then compared with the operative NRRP there will be a large number of additional catchments listed as "flow sensitive" and covered by the rules (5.110 & 5.111) that could restrict planting on a per property basis (this depends on whether the recommended changes to Rule 5.110 recommended in the Officer's Report are adopted).
- 56 The section of the s32 report (on pp99-101) that discusses flow sensitive catchments does not indicate what criteria were used to select these additional catchments, or indeed why different criteria from those in the NRRP were (presumably) used. This should be transparent, and based on potential effects on stream flows, as it was in the operative NRRP
- 57 It appears that ECan has essentially gone back to what was in the proposed NRRP with little clear reasoning or justification. Rather than focussed regulation dealing with actual effects on stream flows in truly sensitive catchments – which surely should be the purpose for such regulation under s9(3) - they have used criteria to select flow sensitive catchments that are not made explicit, and poorly focussed regulation to manage effects. As the s32 report says, this approach may "be over protective of low flows" (in some catchments) and that there is a "trade off between making the plan easier to implement and finessing the approach to

maximise the benefits". What I read into this is "let's go back to a conservative, property bound approach" and let's also be conservative about what we list as flow sensitive catchments.

- 58 In practise this arbitrary 15% allowance for new forest per property before consent is required cannot be effects based. Imagine there are 10 properties in a "flow sensitive" catchment. Each of those properties could afforest an additional 14% of the catchment without consent, irrespective of where they are located and what size they are, with no restrictions on forest planting. By doing this one large headwater property could reduce 7dMALF by more than 5%. On the other hand a smaller property lower down the catchment would require resource consent if it wants to plant 16% of its property in trees, even though the effects of doing so on stream flows would likely be minimal.

#### **THE OFFICER'S REPORT**

- 59 Pages 295 to 304 of the Officer's Report comment on submissions on flow sensitive catchments, and make recommendations for some changes to the rule framework. I commend the officer responsible for this report in that some good thought has gone into considering how the concerns of submitters such as Rayonier can be met, at least in part.
- 60 No changes are recommended to Policy 4.64 or Rule 5.109. I agree that the policy does not need amendment, and the permitted activity rule is effectively the same as in Rule WQN27 of the Operative NRRP. I support both these provisions.
- 61 Rule 5.110 has two significant changes recommended. First, the activity status is recommended to be changed from permitted to controlled. Second, the threshold for meeting the rule is changed from 15% of a property to 20% of the total area of flow sensitive catchment or sub catchment.
- 62 I support the change to a controlled activity as the only matter for control is the provision of information, which is important for ECan to administer these provisions effectively.
- 63 While I do not support the second limb of Rule 5.110, I do support the changes recommended to it, at least in smaller catchments. It is a significant improvement over the provisions of the pLWRP as notified. This is because the rule now refers to the total area planted in a catchment or sub catchment – if the total area does not exceed 20%, planting is provided for, and this provides at least a potential opportunity for significant afforestation as a controlled activity on individual properties that the rule in the proposed Plan doesn't.
- 64 The problem with this rule, as recommended to be changed, is that from an effects based viewpoint it remains flawed. This is because the effects on water yield of planting in a catchment depend critically where the trees are planted. If they are in the headwater reaches, where baseflow is generated, 20% afforestation could have significant effects on 7dMALF. However, outside of the headwaters effects will

largely be on average flows (as was the case with the Button application described in paragraph 47 above).

- 65 No changes are recommended to Rule 5.111. Some changes are recommended to the lists of “flow sensitive catchments”, but the reasons for this are not made very clear in the Officer’s Report. I cannot assess how valid these changes are as I don’t know what criteria were used to identify “flow sensitive” catchments.

## CONCLUSIONS

- 66 The notified NRRP included rules to control forestry in “flow sensitive catchments” on a per property basis. Consent was to be required if more than 15% of any individual property in one of these catchments was to be afforested.
- 67 Submitters representing forestry interests were strongly opposed to these provisions. After extensive deliberations NRRP commissioners decided to regulate new forest plantings in catchments that met specified criteria (7dMALF would be reduced by at least 5% and/or average flows would be reduced by 10% or more). The operative NRRP identified nine catchments as flow sensitive. These required detailed hydrological mapping for the relevant rule (WQN28) to be administered.
- 68 By returning essentially to the approach in the proposed NRRP, ECan have in the pLWRP placed administrative simplicity ahead of managing effects. As any such rules to control forestry in flow sensitive catchments are made under s9(2) of the Act, in my view they should be strongly focussed on the effect being managed, not administrative simplicity. In other words the primary focus should be primarily on effectiveness, not administrative efficiency. The approach ECan have used in the proposed plan returns to the NRRP as notified, ignores NRRP submitters, ignores the deliberations of the NRRP hearing committee, and is not founded in effects based management. It should be rejected because it lacks reasonable justification, and the approach in the operative NRRP inserted in its place.
- 69 However changes recommended by Officers to Rule 5.110 are a significant improvement over what was in the proposed LWRP, but they remain flawed because they are not entirely effects based. This is because effects on flows depend where in a catchment trees are planted, with headwater locations being particularly sensitive.
- 70 However I do think the amendments recommended by Officers to Rule 5.110 have merit in smaller catchments. One of the nine flow sensitive catchments subject to restriction in the operative NRRP is French Farm Stream on Bank’s Peninsula, which has an area of <5km<sup>2</sup>. There are only likely to be one or two landowners who could afforest significant parts of the catchment, so a restriction on a catchment area planted basis could be appropriate there to maximise efficiency. This could also apply in other small catchments of say up to 20km<sup>2</sup>. This would include most of the additional “flow sensitive” catchments listed in Sections 6-15 of the pLWRP, as many of these catchments (or at least those I am familiar with) are small

- 71      However in larger catchments – the Waipara for instance is 856km<sup>2</sup> - it would be inexcusable in my view to sacrifice effectiveness and targeted regulation to protect water yield simply because to do so would be administratively expedient. Instream values and resource users such as downstream users and forestry interests deserve better than that.
- 72      ECan have also added about 24 new “flow sensitive catchments”, some with specified sub-catchments in Chapters 6-15 of the pLWRP. Officers recommend several of these be removed. No indication is given however as to what criteria were used to define these “flow sensitive” catchments. In my view the criteria should be clearly specified, just as they are in the operative NRRP. I can see no reason to move far from the NRRP criteria, with perhaps the exception that effects on average flows should target summer months.

Dr Brent Cowie

4 February 2013

Memorandum dated 21 February 2008

## Memorandum

**From:** Brent Cowie  
**To:** NRRP Panel 1 Commissioners  
**Date:** 21 February 2008  
**Subject:** OR 13 – Forestry and Water Yield

### 1 Recap

We heard the initial submissions on this section of Chapter 5 of the Plan in September 2007 as Officer Report 13. It primarily covered Issue WQN2, Objective WQN2 and Policies WQN5&6.

After the hearing we met and decided to seek further information from the officers and NIWA staff on the merits of the 'low flow producing area' approach advocated by the forestry industry. This was received in late October. It comprises three documents – an additional report from Cathie Brumley, an additional report from NIWA by Maurice Duncan and comments by Maurice on Tim's evidence.

We also allowed further legal and technical comment from the forestry submitters, and this was received in late November. It too comprises three documents – additional legal submissions from Chris Fowler and additional technical information from Tim Davie and Phil Taylor.

Before coming to discuss this matter on 10 March I want you all please to carefully read the additional material in particular, and scan through the original submissions and the officer report. Some panel members have previously expressed strong views on this subject, but we need to debate it openly in a constructive way looking at the options in front of us carefully.

## 2 Background

Land use for forest planting was not restricted by ECan prior to the notification of the PNRRP. ECan has chosen to regulate some new forest plantings (but not replanting) under s 9(3) of the RMA in relation to its functions under s 30. This differs from the situation under RMA sections 13-15, where the default position is that a consent is required to undertake activities such as discharges to the environment or the taking, damming, diverting etc of water. Rather in this case ECan has made a deliberate choice to regulate.

The present policy and regulatory framework, and the justification for it, was strongly questioned by the forestry industry, as represented by the Joint Forestry Submitters (JFS).

Starting with the big picture, the main facts are:

- Tall vegetation, such as plantation forests, undoubtedly reduces the annual water yield from many “sensitive” Canterbury rivers and streams.
- These “sensitive catchments” fall into three main groups – those in the foothills to the west of the plains, those in the rolling country of South and North Canterbury, and those on Banks Peninsula.<sup>1 2</sup>
- During dry late summer and autumn months many of the sensitive catchments have discrete geographic areas that produce most of the low flow. These areas will tend to be in the higher altitude (wetter) parts of a catchment, and can be defined by ECan. (They are shown in the colour maps produced by Maurice Duncan in his supplementary evidence). Accordingly, a significant proportion of the low flow during these dry months will be protected by not having much tall vegetation in these areas that produce most of the low flow. This will offer some protection for instream values in all but severe drought conditions.
- In all but very low flow conditions however, having significant amounts of tall vegetation in the balance of a catchment that does not produce most of the low flow will reduce downstream average and median flows, and so reduce reliability of supply for other users. (These effects will be exacerbated by climate change).

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<sup>1</sup> Forestry is also actively discouraged on Banks Peninsula by District Plan restrictions.

<sup>2</sup> The map produced by Mr Taylor as part of his supplementary evidence shows the areas considered by the industry to be suitable for further forestry. This differs from Mr Horrell's map, which overstates the areas with actual potential for forestry.

- “Natural” reversions to scrub and mixed native/exotic assemblages are occurring in many of those sensitive catchments where marginal land has become uneconomic to farm. This will have adverse effects on water yield which cannot be controlled by ECan.
- Similarly willows, either planted for river control purposes or propagated “naturally”, can have significant adverse effects on low flows in some foothills catchments.
- Forestry may be a “better” economic use of some land than is extensive farming in many sensitive catchments. It also has other potential benefits, such as for water quality, soil conservation and carbon sequestration.
- Current economic conditions do not generally encourage large scale forestry. However those economic drivers appear to have changed significantly now that forests can acquire carbon credits, and the government has also announced that it wishes to promote large scale afforestation.

### **3 Comparisons of Effects on Flows of the Two Approaches**

Two different regulatory approaches have been advocated to us. The first by the officers is to require consents for new forest planting on a property by property basis. That by the JFS is only to regulate new forest planting only in the “low flow producing area” part of a sensitive catchment.

The supplementary evidence from Maurice Duncan shows that there is generally not a great difference in the effects on low flows of the ECan approach versus the JFS approach. Where the difference becomes much more apparent is the comparative effects on median flows. This is shown for instance in his Figures 4-7 for the Waipara catchment, Figures 10-13 for the Selwyn catchment, Figures 16 and 17 for the Okuku catchment and Figures 28 and 29 for the Tengawai catchment. In some other catchments, most notably the Okuku, there is less difference between effects on low and median flows (Figures 20 and 21).



## **4 What are we Managing Water Yield to Protect?**

As highlighted by those figures discussed above, what we are managing yield for has significant ramifications. If it is to protect instream values and community water supplies we need concern ourselves primarily with water yield at times of low flow. This would lead towards adopting the “low flow protection area” approach. If we are trying to also protect the rights of other users, then we need to look more at the overall annual water yield from a catchment. This approach would potentially involve greater restrictions on forestry in sensitive catchments. The third approach is to say that the effects of forestry on water yield are too small for ECan to become involved in any regulation of forestry as a land use.

The NRRP in its current form talks of managing yield to help maintain instream values and community water supplies, and to help protect the rights of downstream abstractors. An argument promoted by the JFS is that protecting downstream water users goes beyond the CRPS. While this is arguably correct, it is quite permissible to do so. At the time that the plan was notified the test was that the NRRP not be inconsistent with the CRPS. There is nothing that prevents the plan going further than the policy statement. Indeed, it does so in many ways in most objectives and policies throughout the plan.

Arguably having no regulation would not implement the CRPS. I think this is perhaps open to doubt. The relevant Issue, Objective and Policy (8) are in Chapter 9 on pp 132-133 of the CRPS. The wording is quite weak – referring to instance only to “some land uses” rather than forestry per se (although it obviously implies that forestry is the concern).

## **5 The Two Approaches to the Rules**

- The differences between the NRRP approach and that advocated by the JFS are well demonstrated in the diagrams attached to Cathie’s supplementary evidence.
- From a forester’s practical viewpoint the current rules in the Proposed Plan appear to be partly unworkable. This is because placing restrictions on the amount of land in one title that can be converted to new forest plantings without consent appears to be a significant impediment to any further large scale forestry plantings in much of Canterbury. Reasons for this include additional uncertainty about whether land purchased for forest planting could acquire consents, additional cost and a perception that ECan is actively discouraging forestry in these sensitive catchments.
- My reading of the current policy and rule framework is that there is some risk that consents would tend to be declined for forestry plantings over and

above the 5-20% thresholds proposed. One could argue that additional forestry may be allowed outside of the area that produces most of the low flow, but the combination of the way the industry operates (the forestry companies will usually buy whole farms for planting) and the uncertainty about consenting may provide strong disincentives for additional large scale forestry in Canterbury. I also think however that this uncertainty and its consequences were rather overstated by the JFS.

- I also consider the proposal put forward by the JFS is much more effects based than that advocated by ECan officers. This is because it much better targets the critical parts of a catchment that provide low flow yield, rather than the more scattergun approach shown by Cathie's figure. The downside of the JFS approach is that it would be more difficult to administer as it will involve some debate about what are the low flow producing areas in a catchment. The "title" approach advocated by officers is much simpler to administer.

## **6 Three Broad Alternatives**

In broad terms we could:

1. support the current Council position, as advocated by the officers;
2. decide that there is no justification for any restrictions on forestry to protect water yields; or
3. go with a compromise option, such as that advocated by the industry.

## 7 Comments

1. Having listened to all the evidence I consider that the first (status quo in the plan as notified) option is neither justified nor workable in practice. In other words, I think that the costs of such regulation exceed the benefits, that the regulation is poorly targeted, and that from a practical viewpoint it will provide significant disincentives to additional large scale forest planting during the life of the Plan. It is also very much based on ease of administration (which has the benefit of being certain) rather than potential effects.
2. The second option offers no additional protection for instream values over the unregulated situation, nor does it protect the “rights” of other water users. It will however not discourage large scale new forestry should market conditions change, and there are significant benefits from large plantings. It is also very simple – there would be no ECan regulation restricting forestry plantings.
3. The compromise option offered by the industry appears reasonable and is certainly effects based, but it involves some uncertainty and so may not be easy to administer. If we decided to run with this option, then we can choose between several different possible approaches, as portrayed for example in Figure 1 of Maurice Duncan's supplementary evidence.

## 8 Where to from here

We have two initial decisions to make:

1. Is there any justification for regulating new forestry plantings to maintain water yields in sensitive catchments?
2. If the answer to the first question is yes, what is the most appropriate form of regulation to provide such control?

These two questions are linked. One possible view for instance is that while there is some justification for regulatory control on new forestry, that control should be strongly focused on those areas that produce most of the low flow, which is consistent with the effects based approach of the Act. This is what the forestry industry now seeks as its fallback position. Its preference remains that there be no regulation.

## Extract from decision overview

**6 Issue WQN2, Objective WQN2 and Policies WQN6 & WQN7 – Forestry and Water Yield**

These matters are addressed in Decision Report 13. This is a subject of policy in the NRRP where we made major changes to the direction in the plan as notified, and as reported back to us.

Essentially the approach in the proposed plan was that new forestry planting would be restricted as a permitted activity to a percentage of any one property in 59 flow sensitive catchments. This threshold varied from 5% to 20% of a property, depending on the sensitivity of the catchment to change. Consent would be required above these thresholds. These rules depend on s9(3) RMA land use controls.

This approach was strongly opposed by a forestry industry collective called the “joint forestry submitters”. These foresters were supported by some other parties, notably what we might call “forest farmers”. They were opposed to any restrictions on forestry to protect water yield. As an alternative however, at the hearing the industry essentially sought that any restrictions on forestry planting as a permitted activity be limited only to 20% of the low flow producing area (which is the higher rainfall part of any catchment that contributes primarily to the 7 day MALF). This is because they were particularly concerned that the rules as drafted were prohibitively restrictive against opportunities for large blocks of new forest planting in the 59 catchments listed in the proposed plan.

We gave a great deal of thought to this matter, and as part of this asked several times for further information from officers. This included asking for comment on the merits of the low flow producing area approach, with additional reports being sought on possible approaches to managing flow through the low flow producing area approach.

We initially came to two main conclusions. First, there was justification for controlling new forest planting in at least some flow-sensitive catchments because of its effects on water yield. Second, controls on planting on an individual property basis were seen as being potentially onerous and not effects based.

The first additional analysis undertaken looked at controls on forestry on the basis of a number of isohyds drawn across flow-sensitive catchments. We used these to look at different levels of threshold control on forest planting as a permitted activity. While the analysis used gave us much additional information on which we could base our final decisions, this approach was cumbersome and administratively uncertain for landholders, and would be difficult to interpret and enforce.

After further discussion we decided that the focus for controls on forestry in flow sensitive catchments should be on achieving sustainable environmental outcomes which are:

- To protect at least 95% of the 7 day Mean Annual Low Flow (7DMALF). This meets our duty under s5 – the Purpose of the Act – to sustain the life supporting capacity of water and ecosystems. This is consistent with hydrological criteria often used to set minimum flows, and we are confident that this will protect that life supporting capacity and their instream values.
- To protect 90% of the mean flow. This is to provide reliability of supply to other users of the water resource including community water supplies and irrigators, while at the same time allowing for what we consider a reasonable level of forest planting in flow-sensitive catchments.

To implement this we requested additional analysis of the flow sensitive catchments. This determined that of the 59 catchments listed as flow sensitive in the proposed NRRP, only nine needed to be included in the plan to provide for the environmental outcomes that we consider necessary. These nine catchments have each been divided into two areas – the low flow producing area and the balance of the catchment. These areas are mapped for each of the nine catchments in the Map Volume. Thresholds have been set on planting in the low flow producing area and the balance of the catchment, to protect both 95% of the 7DMALF and 90% of the mean flow. As a result of this decision the use of the term

“Forestry Unit” is removed from the Plan. Also, the range of limits per Forestry Unit in Schedules WQN15.1-WQN15.4 has been replaced with a single Schedule WQN15 listing the nine catchments to which controls will be applied.

To meet these outcomes Environment Canterbury requires accurate and up-to-date information on the cumulative total of new areas of forestry planted in each catchment. Landholders will also require this information to identify whether their proposed planting will come within the thresholds defined for the catchment. To achieve this certainty, we have decided to make new forestry planting a controlled activity up to the threshold limit. There are only four matters for control: the location and size of the new area to be planted, the proportion of the new area to be planted within the Low Flow Production Area; the effect of the new area of planting on the water allocation status of the catchment and consent duration. Replanting of existing areas of plantation forest is permitted.

This approach has some strong advantages. It promotes the sustainable management of water resources by protecting life supporting capacity. It also offers significant protection to existing users while allowing landowners reasonable use rights on their properties. As such, it is effects based, transparent, and we believe equitable. It will provide for the sustainable management of water yield in flow sensitive catchments on robust and defensible grounds. It also provides certainty for land owners wishing to undertake significant forest plantings on their properties in the flow sensitive catchments.

We acknowledge that this approach is not perfect. It relies on detailed mapping of the catchments, which has now been completed. It also allows an element of “first in first served” in terms of land owners taking up the planting of forests to the thresholds established. But this is far better than the arbitrary limitation of planting to a limited amount per property over an entire catchment. We would also note that much of the “balance” area in these catchments may well be too summer and autumn dry to sustain forest plantings, so the thresholds in these areas may not be reached in the longer term unless the comparative economics of forestry versus farming on hill country change significantly. This may occur partly as a consequence of the new Emissions Trading Scheme

## 6.1 Notes

Commissioner Johnston is in general agreement with the panel’s decision to remove about 50 catchments from restrictions, which is now more focused and effects based than the per property restrictions in the plan as notified. He agrees with the general principles of maintaining environmental or low flows in rivers and streams. Some questions remain for him however. He retains reservations about the robustness of the science and the models and trials on which it is based. He notes that even if the science is correct, then it seems a contradiction for the plan to focus principally on exotic forestry while having little regard to any effects on water yield from indigenous forest and its regeneration. He notes that this has been highlighted recently by matters such as the Emissions Trading Scheme and carbon farming, which were not in place when the plan was being developed. Hill country farmers are today being encouraged, and paid, to allow regeneration to native forest, or to plant more trees with little consideration of water yield. To him this seems to be a complete turnaround.

Commissioner Johnston says that the other major conundrum was to balance the rights of existing users of water with the rights of the property owners from where the water comes and their ability to utilise their land. He believes that this is more in favour of current users, and while afforestation opportunities are still there for the property owners in the nine catchments, they will eventually be taken up. Meanwhile existing or new users of water may increase their take, and reversion to indigenous forest may well continue.

Commissioners Cowie, Kirk, Oldfield and Woods accept that there is a well established link between forest plantings and water yield. We four commissioners also consider that the effects based approach we have adopted is clearly outcome based, and promotes sustainable management while much limiting the degree of regulatory intervention in forest plantings in the region. As this is the majority view, it is our decision.