

And an application by Rangitata Diversion Race Management Limited

To construct, maintain and operate a large water storage facility and associated activities.

TABLED AT HEARING

Application: *RDRM*

..... *Joint Hearing*

..... *02/05/2018*

Statement of Evidence from Matthew C Hall

I have been fishing the Rangitata River for more than sixty-five years and that equates to just about the lifetime of the Rangitata Diversion Race. I have spent thousands of hours on the riverbed studying the life of the river and I have enjoyed many amazing experiences. For me this has been part of my way of life-my culture. On numerous occasions over the years, I have pleaded for the retention of the river, in its natural state, in the knowledge that if the river is lost this is another step our generation is taking towards 'A silent Spring. During my time many of our Canterbury Rivers have become degraded and no longer hold the values they once held. As we manipulate the natural environment there are changes and declining populations of many species.

1. I oppose these applications because I am unable to see how these applications support the natural environment of the Rangitata River.

- 1) Water taken from a river, is no longer water in that river and therefore cannot support the life supporting capacity of that river.
- 2) I would be one of the first to admit the social and economic benefits of 'water put to work' for power and irrigation has changed the face of Canterbury. Greater use and benefit can be gained for the more efficient use of existing takes without taking additional water from the river because taking additional water will take away the life supporting capacity that this additional water currently provides in the river.
- 3) Fish screens aside, there is nothing that I can see from the applicant's activities by taking more water for irrigation and power generation that supports the natural Rangitata river.

2. I have not seen suggested conditions attached to the draft permits that protect the natural environment of the Rangitata River.

- 1) I have not read all the submissions or evidence lodged by the applicant. I therefore do not know what the applicant proposes by way of mitigation that will help the natural river. In the light of the applicant's proposal to take water away from the river I cannot see how the adverse effects of this activity can be mitigated. Adverse

effects can be prevented by declining the application to take the additional 10 cumecs.

- 2) I have heard that the applicant no longer proposes to sluice the debris from the lake at Montalto back into the river. This ticks a box and cuts out part of my objection to the lake proposal. I have no great objection to the storage lake provided it is safe and the productivity from the water stored in the lake does not further enrich our natural water ways.
- 3) My main objection is around the additional take from the Rangitata River because this is taking water away from the natural processes of an outstanding braided river. While the take may be argued as minor it isn't, it is 10 cumecs or at times, would be equivalent to about one third of the current take. It is also not minor because the take would likely happen over the lifetime of the RDR.
- 4) I am aware that the applicant is a formally constituted company incorporated with the objective 'to provide water for irrigation development and to generate power'. The company's model differs from say the model used at Lake Opuha where part of the stored water is allocated to the environment.

3. The purpose of the Rangitata Diversion Race needs to be considered.

- 1) If you stand on the concrete abutment at the Klondyke Intake when the Rangitata River is running at 75 cumecs – (about the median flow) you can clearly see the water of the Rangitata River being drawn in to the Rangitata Diversion Intake and down the RDR. For roughly half the time the RDR and others are taking approximately 33/75 cumecs (or less) leaving 42/75 cumecs in the residual river. The effect of the draw off is significant and the take is significant. I have read the publication of "Water put to Work" issued under the authority of the Hon R Semple, Minister of Works, and I appreciate the magnitude of the scheme and what it delivers to the community. This cannot be denied and should be applauded.
- 2) Rangitata Diversion Race Management Limited purchased off the Crown, the infrastructure and with this the relevant water consents. The allocation of water to the Irrigation Schemes is scheduled in the Irrigation Schemes Act 1990. The scheme was sold for irrigation and power development with a block of shares held by the Ashburton District Council. It was always my hope that the Ashburton District Council would represent the wider community interests including the environment and as far as I am concerned this has never happened. Any value to the natural river environment is a bi-product of the scheme rather than any part of the scheme. The

RDR does not benefit the environment by providing water to the Hinds or Ashburton Rivers at times of critically low flows. The focus of the RDR has become water for stock, irrigation and power development, not to benefit the district's natural rivers.

- 3) The Managed Aquifer Recharge trial, and currently that is all it is, has the potential to support the life supporting capacity of rivers such as the Hinds. I have not seen any commitment by RDR or others to fund an improved minimum flow for waterways like the Hinds River. I see no direct link between the 10 cumecs extra take from the Rangitata River and improved flows in the Hinds or Ashburton Rivers either directly or through MAR.
- 4) The Ashburton Zone Committee, (Chairperson - 2010-2013) worked on the Hinds Plains, Hekeao plan Change 2 Land and Water Regional Plan. In this work the problems associated with nitrates were identified – estimated 4500 tons annually leaching into the aquifers in the Hinds zone. MAR was discussed as a way of possibly mitigating nitrate leaching. We also talked about the future of the Cracroft stock water race and its possible closure. I saw Cracroft as a source of water for the Hinds whether via MAR or by direct augmentation. This is an existing take from the Rangitata River and would not further compromise the Rangitata. The problem of the low flow in the Hinds River could be remedied by using part of an existing take rather than taking additional water from the Rangitata River.
- 5) More, I expect by default than by design in its early history the RDR was regarded as an excellent fishery. The race was home to a good population of trout and juvenile salmon. They freely entered the scheme from the Rangitata and the Ashburton Rivers and they were reared in a safe environment free from floods and predation. The water in the RDR was regarded as natural water under the Water and Soil Conservation Act. As a member of the Ashburton Acclimatisation Society in the 1980's I recall how we used to debate (often quite vociferously) the relative merits of the RDR as a fishery. As time went on, it became apparent that the increasing uptake by farmers of the water for irrigation was having a negative effect on fish populations. In those days because of their homing instinct many adult salmon took their original route, in returning to their spawning grounds. This meant adult salmon returned to the RDR and the irrigation schemes at the following locations. My experiences are-

- 1) Shoaling salmon at the Highbank Power station tailrace attracted to Rangitata water. (On one occasion I assisted in removing over 300 adult salmon from the tailrace)
- 2) Salmon homing in on the Ashburton River around the Coniston discharge from the RDR and at the South Ashburton spillway.
- 3) Salmon shoaling at the Coldstream Discharge (On one occasion I counted 28 adult salmon in one pool in the tailrace.) The persistence of adult salmon migrating back in to the lower Mayfield Hinds scheme resulted in a grill being installed on the irrigation race to prevent adult salmon entering the scheme.
- 4) Salmon shoaling under the Rangitata Railway Bridge at a discharge point at Ealing.
- 5) At the end of each irrigation season, and as water in the schemes was turned off several hundred- juvenile salmon and trout were salvaged from the drops in the irrigation schemes. Occasionally I assisted.
- 6) Over the years as more and more water has been utilised by the irrigation schemes these events have diminished. It is logical that fish that previously made their way back to the river through the schemes are now being lost within the schemes. Expanded use of water within the schemes means there are no or limited discharges back in to rivers as a way for juvenile salmon to escape the system.
- 6) In recent years the advent of dead end ponds (on farm storage) and the greater up take of water has reversed the value of the RDR as a fishery from once being perceived as having a positive effect on the fishery to now having a negative effect on the fishery. There will be no positive impacts, that I can see, to the fishery within the RDR, in taking an additional 10 cumecs of water from the Rangitata River.
- 7) During its existence, the RDR as a matter of convenience, has discharged water in to the Hinds River, South Ashburton, North Ashburton. It has augmented the flows in these rivers. These flows have to some extent supported the ecology of these rivers. Electricity production and expanded irrigation means the RDR is no longer seen as supporting the ecology of these rivers. An additional 10 cumecs of water taken from the Rangitata River is not seen as providing any benefit to these rivers. The additional water is about taking water for irrigation and power generation.

4. The more efficient use of existing takes must be a priority.

- 1) There are water swap agreements in existence between various consent holders that set the precedent in the efficient management of water. Using this principle of being able to swap water around there are a whole lot of opportunities for the more efficient use of water. Wider options include
 - 1) Storing the water when evapotranspiration is low. This can happen at any time during the irrigation season.
 - 2) It would be possible to start the irrigation season late or finish it early, utilising the water to fill the lake. This season is a great example of how at the end of season water could be stored.
 - 3) Utilising part of the winter flow of the RDR – about 5 cumecs out of RDR winter flows for 100 days would go a long way to filling the lake. Often this is silt free clean water!! I understand this water is currently consented to Trustpower but then this is only a consent and can be varied especially if other commercial opportunities within the RDR or Canterbury are on offer. There is of-course the Lake Coleridge precedent where Trustpower supplies water for irrigation.
 - 4) Extending arrangements with BCI – I understand there are existing water swap agreements with BCI.
 - 5) Creating efficiencies by further piping irrigation schemes. Not all schemes are piped.
 - 6) Swaps between the Ashburton and Rangitata water takes on the RDR, particularly during the winter months, if there is a good flow in the Ashburton River. (Giving the opportunity to fill the lake.)
 - 7) Turning to existing irrigators and managing their water takes especially during rainfall events and periods of low demand. (Only efficient application methods used)
 - 8) If 100% irrigation efficiency is the aim then augmenting from groundwater at times of high demand has merit, far ahead of taking more water from the Rangitata River.
 - 9) Expanding Good Management Practices under the Land and Water Regional Plan to further limit nitrate leaching by applying less water as a method of limiting leaching.

- 10) Efficiencies created through variable rate irrigation methods that would avoid the unnecessary ponding of water on paddocks, irrigating tar sealed roads and railway lines (All events I have witnessed in the last year)
 - 11) Better use of technology such as lysemeters that measure ground moisture. (Known to create efficiencies) Currently sparingly used. With this the expanded use of water efficient model farming.
 - 12) Picking up existing surpluses in irrigation schemes – when the seasonal demand is not high.
 - 13) Moving to farming practices that use less water.
- 2) I am not an expert in any of these matters and I may be criticised for mentioning them. Normally I wouldn't even mention them, but I cannot believe that an extra 10 cumecs take from the river for 14% of the time, (I understand -the efficiency of the proposed extra water from the Rangitata) cannot be picked up by applying one or more of the above efficiency measures. Currently the application for the extra 10 cumecs is an attack on the Rangitata River rather than as I see it 'best practice and the best use of existing water takes'. These opportunities have not been exhausted. It seems a harsh move to cost the river its environment when so much more can be done to efficiently use water.
- 3) Historical South Canterbury Catchment Board records (MOW records L181) showed the Rangitata Diversion Race was authorised to divert and take up to 28.32 cumecs of water from the Rangitata River. For the earlier years of the scheme, the take was always referred to as 1000 cu secs (1000 cubic feet per second) at Klondyke and converted to metrics this is 28.32 cumecs. Somehow this has sneaked up to 30.7 cumecs and under the Conservation Order up to 33 cumecs in total from the Rangitata. RDRML has had the benefit of additional water in recent years that was not authorised in the early years of the scheme. In earlier years 22.65 cumecs was the authorised discharge from the RDR at Highbank. The relevance in my view is that RDRML has already stretched the envelope and is taking more water (around 10% more than was initially authorised). If RDRML wanted too they could store this additional water (sneaky water) in the new lake.

5. The applicant activities should have no adverse effects on the Rangitata River. (In relation to sediment)

- 1) On the understanding the applicant has withdrawn the consent applications relating to the discharge of sediment from the lake at Montalto this aspect of my submission has been rewritten.
- 2) The environment in which we live is subject to constant change. Part of the change arises from natural events and part from the impacts of human activity. If it is said that after seventy years of activity the RDR has had no effect on the Rangitata River below Klondyke then this would be going against the principle of constant change. (Unbelievable) The greatest change is that for much of the time between a third and half the natural river no longer flows down the lower river. There are two main elements in creating an active braided river, water flow and river bed sediment. It is the constant movement of these two elements that creates a healthy braided river. While the larger floods obviously clear the riverbed fairways of weeds and cause the greatest movement of sediment, it is the smaller freshes that revitalise the processes of a braided river. The lower section the river is constantly changing cutting new banks and forming new braids. As river flows fall, so does the velocity and the scouring action that forms the braids, diminishes. The path of the water and sediment is one way, downhill to the sea. In the terms of cumecs, 42 in the river/75 (cumecs) is not the same as 75/75(All the water in the river). The effect in my view is that the heavy sediments have not moved as far or as fast as the lighter sediments and during my live time there has been a remarkable change. It is plain to see there are now large areas of mud, sand and fine cobbles in the lower reaches of the river and this has altered ecology of the river. Cobbles that once were clear of silt are now covered in silt. The change has been subtle and hardly noticeable on a yearly basis but over a lifetime is now very noticeable. We need to understand effects over a lifetime because the principle of constant change is always with us. With the application pending or those recently granted, the flat lining of the flows of the river between 110 and 140 cumecs will cause further change to the transportation of sediment and add to the silt load in the lower river because this is taking away water and velocity. An additional 10 cumecs taken (in fact 30 cumecs if you take South Rangitata) from the river must over time, alter the braided river processes. This is logical.

3) Coastal erosion along the Canterbury coast is part of the natural process and this has been going on for thousands of years. At the same time as this erosion is occurring the sediment movement down our braided Canterbury Rivers keeps recharging the shingle bar at the river mouths and it is this bar that largely provides a protective barrier to the hut settlements that sit behind the bar. With global warming and threats from rising sea levels these settlements are at risk and in the longer term will most likely have to be moved. Flood flows in the Rangitata River and the movement of sediment is vital in the process of the renewal of the shingle bar. The effectiveness of the river to move sediment especially the larger cobbles depends on higher flows and velocity. Any additional take of water from the Rangitata River that takes water away from the river, effects the movement of sediment and the creation of the shingle bar. It could be argued 10 out of 90 (the flow in the residual river) at 140 cumecs in the river or in other words 90 cumecs in the lower river v 80 cumecs in the river, is not material. Over 10% to me is material at these flows especially if the life of the take or consent is 100 years or more. We are not talking about changes happens in a day or a week or a year here, it happens over a lifetime. Certainly, what is happening to the shingle protective bar is significant to hut holders at the Rangitata River mouth. Diminishing the protective processes of a braided river by taking water out of the river, to me does not make much sense when we know the capacity of coastal erosion is increasing. From a sediment transportation view point the effects of the South Rangitata take at Arundel has not been fully felt (It is in its infancy) and this combined with the existing block of water taken out by RDR must cause change to sediment movement - increasing this by a further 10 cumecs is not a good strategy if sediment movement is a consideration.

4) I have often fished for salmon in the lower reaches. One of the areas I target when salmon fishing the lower river is the pools and the soft lies where salmon rest. These soft water areas are left as the velocity fall out of the river after a fresh. Invariably these days, many of the soft water areas fill with sand within a day or two and this is a change during my time that is affecting instream habitat and salmon fishing.

6. The applicant activities should have no adverse effects on the Rangitata River. (In relation to fish populations in the Rangitata River)

- 1) As a councillor on the Central South Island Fish and Game Council I am aware of the failed attempts by Rangitata Diversion Race Limited to exclude fish from their scheme. (I am not speaking on their behalf) The bio-acoustic barrier was installed with expert advice, yet even with expert advice it has failed to deliver the targeted levels of fish exclusion. The loss, to particularly the salmon fishery, resulting from this failure is a disaster. Fish and Game in their submission may have provided provide you their estimates of the numbers lost. Extra water taken under a new consent will only add to the losses. This is unacceptable to a salmon fishery which existence must currently be regarded as seriously threatened. Because of the applicant's failure to demonstrate that they can exclude fish from their scheme the application for additional water should be declined. In my view RDRML have failed the fishery. There is no effective fish exclusion device installed on the RDR and whether RDRML can at some future date install an effective fish screen has yet to be proven. (Who is to say today's experts are any better than yesterday's – just like salmon fishing though I live in hope!)
- 2) It appears to me that the application is about realising the potential to sell water across Canterbury to bidders that so far can only been loosely defined. The application is fraught when the applicant is so called 'dancing with the shadows' hoping that one day they will materialise into buyers. This is at a time when I believe the natural river is struggling.
- 3) I would have thought the applicants should be more worried about securing water for their existing users because their existing structures are not compliant. RDRML are failing to exclude fish from their current take which surely if pressed to do so would create a compliance issue. Their history of non-compliance or ability to comply should be a reason to decline the application for more water. The Canterbury Regional Council may not be enforcing compliance because RDRML have plans in place. The reality is RDRML has no efficient screen in place, RDRML are in breach of their consent and they are not complying with the Rangitata River Conservation Order. The Canterbury Regional Council's track record in enforcing compliance of the condition relating to fishing screening the RDR has cost the fishery dearly. As a Fish and Game councillor by far the biggest single issue, salmon anglers at the Rangitata River mouth challenge me on, is the failure to screen salmon out of the RDR. The Canterbury Regional Council has yet to show that they can competently administer the Rangitata Conservation Order and conditions

relating to fish screens and by granting more water in these circumstances will simply be a further nail in the coffin of the salmon fishery. Talking facetiously, I fear they may still be holding a committee meeting when the fishery is in fact gone.

- 4) If this application is being sold on the need to realise the potential of irrigation and 100% reliability, – with a 10 cumecs additional supply of water that on its own is not sustainable, then spare a thought for the potential of the braided Rangitata River to realise its potential. The current unscreened takes have cost the river millions of juvenile fish and RDRML through their failure to screen out the fish have denied the river the opportunity to realise its potential, both from an ecologically perspective and for the thousands of potential users who would love to catch a salmon. A Kiwi dream is to catch a salmon! An event that is a memory treasured for a life time. For the sake of the river there is an argument that less rather than more water should be taken from the river, if the river is to realise its full potential.

7. The applicant activities should have no adverse effects on the Rangitata River. (In relation to the health of the Rangitata River)

- 1) Given periods of low flows in the Rangitata River there are blooms of Didymo which can be a scourge if you are fishing or white baiting. Didymo is also known to affect stream productivity. Floods turn over the cobbles and displace the didymo which can pond in areas where the flows tail off. It is the repeated freshes that finally move the Didymo on. Any reduction in velocity and freshes or a change in the hydrograph especially by missing the small freshes will reduce the cleansing and revitalising capacity of river.
- 2) Water put to work means intensification of farming practices, fertiliser and additional livestock. Some development is close to the Rangitata River especially in the lower reaches. The Rangitata River is feed by seeps and weeps that take surface and shallow ground water off the farm land. These weeps can flow for some distance within the berm areas of the river and for much of the time are part of the flood free river habitat, particularly for native species. One of the largest seeps is McKinnon's Creek. In recent times the change in the colour of a number of these weeps has been quite dramatic, from crystal clear water to now the colour of cold tea. The cobbles that use to once be covered in water snails are now smothered in dark brown algae that most likely is the cause of the stain. The application for the additional 10 cumecs is about land intensification and with that the likelihood of ever increasing quantities of brown stained water weeping into the Rangitata River.

Given the appropriate conditions a visit to the mouth of McKinnon's Creek will clearly show the observer what I am talking about. Just another plank in the degradation of the river.

- 3) It is not the flows below the median flows that are the most productive flows in the lower river. If you take the median flow of 75 cumecs – less 33 cumecs taken - 42 cumecs or less is left in the lower river – That's about the mean natural annual low flow figure for the river and this currently exists for 50% of the time. The river mouth becomes constricted at these flows and the river is clear and predating species are causing the greatest harm. It is not these flows that make the Rangitata great or sustain the species it is the higher flows, the spring and summer freshes. The flows that the applicants are targeting, is when the river is most productive. (Many times, more productive.)
- 4) A common occurrence these days is sediment held in suspension in the water. This fine sand settles as the velocity decreases and is picked up as the velocity increases. Over the last season at clear river flows there were blooms of sand that at times virtually smothered the tidal reaches. These blooms were particularly noticeable on the outgoing tides. Such an event result in poor habitat for the species that live in the tidal area. From a human perspective no one likes eating sand. Any reduction in the velocity of the river will simply cause a greater build-up of sand in the lower reaches.
- 5) I don't go around with a thermometer but clearly there were days over the last summer when the water temperatures were too high and the lower reaches were devoid of salmon. In my experience water temperature is an important factor in salmon migration and often it is a cold snap that will trigger a salmon run. Any reduction in flows means reduced velocities and a longer time for river temperatures to rise. This will affect salmon migration at a time when the species are already under threat.

8. Are the provisions of Section 5, Section 6, and section 7 of the Resource Management Act 1991, relevant?

- Section 5 - Purpose

(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.

(2) In this Act, **sustainable management** means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while—

(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and

(b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and

(c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.

Every day the RDR remains unscreened there is an effect. The salmon stock has been consumed by the RDR now for seventy plus years. $\frac{1}{2}$ of $\frac{1}{2}$ of $\frac{1}{2}$ of $\frac{1}{2}$ of $\frac{1}{2}$ of $\frac{1}{2}$ of $\frac{1}{2}$ or whatever the fraction is- until viability is gone and in the end of-course there will be nothing! This is not sustainable environmental management. This is not safeguarding the life supporting capacity of water and ecosystems. In the circumstance it is difficult to see why additional water should be granted to the RDR. The salmon fishery needs to recover after years of losses and taking more water from the river must hinder this recovery.

Section 6. Matters of national importance

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

(a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:

(b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:

(c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:

(d) the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:

(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:

(f) the protection of historic heritage from inappropriate subdivision, use, and development:

(g) the protection of protected customary rights:

(h) the management of significant risks from natural hazards.

The Rangitata is a national significant braided river – has a Conservation Order on it. Take more water from the river and as a principle it will be less significant.

Section 7 Other matters

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to—

- (a) kaitiakitanga:
- (aa) the ethic of stewardship:
- (b) the efficient use and development of natural and physical resources:
- (ba) the efficiency of the end use of energy:
- (c) the maintenance and enhancement of amenity values:
- (d) intrinsic values of ecosystems:
- (e) *[Repealed]*
- (f) maintenance and enhancement of the quality of the environment:
- (g) any finite characteristics of natural and physical resources:
- (h) the protection of the habitat of trout and salmon:
- (i) the effects of climate change:
- (j) the benefits to be derived from the use and development of renewable energy.

I am not exactly sure what particular regard actually means in the context of the RMA.

Unless the right questions are asked then the right questions cannot be answered. For me particular regard in the lower river is thinking about the following:

1. The natural braiding and wetted areas in and around the tidal reaches and lower river and what they mean to the survival of the species.
2. The recharge of shingle and sediment to the coastal area.
3. The declining populations of species reliant on the river including salmon and trout.
4. The delicate balance between escapement and capture and where the sweet spot is in the productivity of the lower river.

The Rangitata River Conservation Order.

There has been much written and said about the Rangitata River. Over 1100 submissions were received by the Special Tribunal who heard the Application for a Conservation Order on the Rangitata River. The special tribunal in their report dated October 2002 recommended on page 138 a river management regime consisting of

- *A minimum flow of 20 cumecs in summer and 15 cumecs in winter*
- *Changes between summer and winter minimum flows on 15 September and 15 May.*

- *A 1.1 sharing of a maximum of 33 cumecs abstraction according to a workable schedule.*
- *Additional abstraction of up to 20 cumecs in two steps when the river is above 110 cumecs.....*
- *11. This will produce a flow regime that resembles the shape of the natural flow hydrograph. Major flood events (400 cumecs or greater) will be maintained, as will freshes and minor floods, although these will be reduced by the size of the abstractions.*

I thought at the time the intent was to put a cap on abstraction at 53 cumecs. This is the way I interpreted the report when it was discussed at a meeting of the Central South Island Fish and Game Council.

The recommendations of the Special Tribunal were appealed to the Environment Court and a range of views were held on the matter of a cap on abstraction as set out in a chart on page 28 of the report. This table was amended to show the parties ultimate position at the end of the hearing appendix 5.1. Total abstraction 40 cumecs at 115 cumecs. Essentially this provided for an addition 8 cumecs abstraction from the river. There were further submissions on the matter and some of these are set out in a final report of Judge Jackson dated 22 September 2005. Clause 21 of this report states that how flows above 110 cumecs may be allocated can be dealt with in a Regional Plan.

The final Water Conservation (Rangitata River) Order 2006 sets out a flow regime that generally follows the management regime set out by the Special Tribunal. The main exception there being no cap on abstraction. The Order is silent on the allocation of flows above 110 cumecs. If all flows above 110 cumecs were abstracted, then the outstanding natural characteristics of the Rangitata River would be lost. Clearly this is not the intent. The Special Tribunal stated on page 139 clause 14 of their report

14. 'We consider that without a cap on total abstraction, or restriction on the number of takes in the main stem the outstanding values etc would not necessarily be preserved/protected.'

I do not believe the 10 cumecs take applied for by RDRML was ever contemplated in the Conservation Order process. I never heard at the time RDRML say that they would be applying for an additional ten cumecs. (and I was part of the conversation) I suspect if they

had Fish and Game would have had a different view on supporting their existing takes. As a councillor I would have changed my view from supporting RDRML to opposing them.

Canterbury Land and Water Regional Plan.

As a member of the Ashburton Zone Committee between 2010 and 2013 we did not discuss any variation to the Water Conservation Order on the Rangitata River nor a flow regime for the Rangitata above 110 cumecs. This may have been discussed since my time although I haven't seen any minutes suggesting this happened. There certainly has been no public consultation, a function of the Zone Committee as part of the collaborative process set out in the Canterbury Water Management Strategy. The major braided rivers in Canterbury formed part of the agenda of the Regional Zone Committee and I again cannot recall any report or recommendation, nor have I seen any minute from their meetings or public consultation which promotes a change to the Rangitata Water Conservation Order or deals with flows above 110 cumecs in the Rangitata River. To my knowledge the Land and Water Regional Plan is also silent on flow allocations above 110 cumecs on the Rangitata River.

Canterbury Water Management Strategy (CWMS)

The so called ECan Act which has since been repealed referred to the Canterbury Water Management Strategy and the first order priority

'Regional Approach

The planning of natural water use is guided by the following

First order priority considerations: the environment, customary use, community supplies and stock water'

The CWMS is still alive and the targets under CWMS are still valid and a focus of the Zone Committees. If CWMS is to have integrity, then the environment of the Rangitata River must be a first order priority.

9. **Consideration should be given to the negative impacts of the applicant's activities downstream of Klondyke.**

- 1) Water in the Rangitata River is habitat for many species. Take the water away from the river and it is no longer habitat for those species. At about the average mean flow of say 97 cumecs the river until it reaches Klondyke runs at 97 cumecs, below Klondyke it runs at 64 cumecs. The productive capacity of 64 cumecs is not the same as 97 cumecs. The medium flow is about 75 cumecs which means for half the time the flow above Klondyke is 75 cumecs and below Klondyke the flow is around 42 cumecs or less which is near to the natural mean annual low flow figure for the river. At the actual low flow figure of 42 cumecs, depending on summer or winter flow regime, the flow at Klondyke can be 42 cumecs and the flow in the lower river around 20 cumecs. The productive capacity of a river at 20 cumecs is very limited. RDRML's existing takes have had a huge impact on the productive capacity of the lower river. To demonstrate, a third or half a paddock of grass will not support the same number of stock as a full paddock of grass. Stock capacity finally adjusts to productive capacity. In granting additional water to irrigation some weight should be given to the productive capacity of the river and the cumulative effects of the applicant's water takes on the ecology of the braided Rangitata river.
- 2) At the time of the granting of the Rangitata Conservation Order the takes from the river were limited to about 33 cumecs. At 130 cumecs river flow this meant 97 cumecs remained in the lower river. Rangitata South successfully applied a 20 cumecs take when the river flows at 130 cumecs giving a total take from the river at those flows of 53 cumecs. After the South Rangitata take at 130 cumecs river flow above Klondyke there is 77 cumecs left in the lower river rather than 97 cumecs. The change is recent, and it is significant. It is known juvenile salmon have been lost in the South Rangitata system. The full effect of this take on the productivity of the lower river will not be known for some time. It is appreciated the Rangitata South take abates and ceases at 110 cumecs. Given that the full effect of the South Rangitata take on the productivity of the lower river has yet to fully materialise it is unrealistic to consider further takes from the river until the effects are known.
- 3) At 140 cumecs the applicant is not taking a flood flow in the river. At 140 cumecs, if the application was approved, the lower river would run at 77 cumecs and this is not even the average flow of the river of 97 cumecs. If the Rangitata River is considered to be an outstanding natural braided river then surely the natural mean

flow of the river should be protected for the entire length of the river before any additional takes are granted. If the application is to capture flood flows, then there is an issue of legitimacy and integrity when it comes to the targeting flow levels that are less than the average mean flow of 97 cumecs. (Actually, nearer the medium flow of 75 cumecs!)

- 4) When the river at Klondyke reaches 140 (142.7) cumecs the applicant requests a consent to take a further 10 cumecs from the river. At the time of the Conservation Order the take was 33 Cumecs when the river was 110 cumecs leaving 77 cumecs in the river. Then along comes Rangitata South with its take of 20 cumecs meaning 53 cumecs is taken from the river. RDRML request a further 10 cumecs when the river is at 140 cumecs meaning 63 cumecs will be taken from the river. At the time of the Conservation Order if the flow at Klondyke was 140 cumecs the flow in the lower river would have been 107 cumecs. The proposal is that this flow should now be flat lined at 77 cumecs. In other words, flows in the river between 110 and 140 cumecs will be abstracted from the river. This is unacceptable because it removes the natural variability of flows which is so important to the lower braided section of the river.
- 5) I have always had doubts about the fact that the flows of the Rangitata River can be measured with accuracy. I suspect there is a margin of error in the measurements. RDRML have applied for water above 130 cumecs with a total take of an additional 10 cumecs at 140 cumecs. In practice, how workable all this is given the margin of error and takes at different locations is hard to imagine. Any overlap in takes or any error that reduces the flow in the lower river must affect the productivity of the river. In my view if the RDRML respects the values in the lower river it should not be asking for an additional 10 cumecs at the most productive flows in the lower river they should be relying on their current consents to fulfil any orders for water.

10. The importance of the lower river, the braids and the area under tidal influence.

- 1) Having spent a lifetime splashing across the streams in the lower Rangitata River I have come to realise the importance of this area of the river to so many species. It is a food rich area where sea birds, breed, feed and roost and many fish species congregate. It is a dynamic area of the river that changes by the hour, by the tide, by the day, by the month and by the year. It is the habitat for many species. Unlike other reaches of the river there can be many small braids and often it is easy enough to wander across the whole river. By taking water away from the river the

wetted area of the river will be reduced. If you examine the various flow levels in the river it is easy to gain a perspective on the importance of the natural hydrograph. The real effects are not at Arundel or the Main Road they are in the lower river.

- 2) The common smelt (Retropinna- Stockell smelt) are a key species and in the lower Rangitata River they enter from the sea and on the tides in the millions. They are a food source for many species. Their defence is their sheer numbers and their capacity to breed – otherwise they are defenceless. They are preyed upon mercilessly especially in low clear water flows. They breed in the lower reaches and in the small braids. After dark they move into the shallows do their business over night and often are gone by morning. The wetted areas are their habitat. Reduce the wetted areas and you reduce their habitat.
- 3) Endangered species such as the White Fronted Tern and the Black Billed Gull, plus the Black Backed Gull feed on the smelt and you see them working the braids and the wash at the river mouth. Eels, flounder, trout, mullet and Kahawai are fish species that dominate the estuarine area also feeding on the whitebait and smelt.
- 4) Understanding the sweet period when the habitat is at its best is important if you have the survival of the species at heart. The sweet period is not when the river is high and in flood with high sediment levels. The sweet period is not when the river is low, and the mouth restricted, and the braids diminished causing diminished habitat. The sweet period is immediately after a flood that has scoured a large opening to the sea and the heavy sediment has dropped from the flood waters. In the Spring time this can start when the river is around 200-180 cumecs total flow. The wetted area in the lower river is at its best and the smelt moves in. There are feeding and breeding frenzies. With the higher level of turbidity, it is understandable there is reasonable balance between escapement, breeding and capture. At lower flows the wetted area is not as great and with the combination of the clear water and lower flows, predation is at its highest and survival of the smelt is at its lowest point. The take by Rangitata South at 130 cumecs and the proposed take by RDRML at 140 cumecs is at the sweet spot when the species are at their productive best. I cannot tell you what an extra 10 cumecs or indeed an extra 30 cumecs taken at the productive flows will do to the population of smelt. I don't know. Neither I suspect does anyone else. It can only be bad news for the future of the species because it is taking away habitat.

- 5) If you look at a graph that depicts the difference an additional 10 cumecs will make on existing flow levels, it looks insignificant. I believe in the context of the lower river the 10 cumec take will be significant. At 140 cumecs the take will be 60/80 as against currently 50/90. You could argue that the flow passes through this threshold in a matter of hours or days depending on the nature of the flow event. If the best survival flows for the species is real and I believe it naturally is, the flow is at 180 cumecs (total river flow) the ratio take v the residue river flow would be 60/120 at a time when the productivity of the species are at their greatest. This is one third of the river gone at this higher flow level.
- 6) At the time of the Conservation Order we were talking about a total take of 30 cumecs, now we are thinking about a take of 60 cumecs. Since the Conservation Order an additional 20 cumecs has already been consented and is being taken at flows above 110 cumecs and the effect of this very recent take on populations is hard to judge mainly because it will take some years before the full effects are felt. If the application is granted the lower river will receive 30 cumecs less than the flow at the time of the Conservation Order. The take become a take of 60/80 as against originally 30/110. The difference is significant and must reduce the habitat in the lower river.
- 7) Understanding how a tide works in the braided Rangitata River is relevant to the application to take an extra 10 cumecs. As sea levels rise with the incoming tide the river back-ups into the tidal area. The velocity of river flow going to sea lessens as flows are held and the scouring and sand movement falls away and this is when the species migration is at its best. Part of the river flow works into the tidal area and is ponded much the same as holding water in a storage lake. On the outgoing tide, the sea level falls and the ponded waters empties, into the sea and scours out the mouth ready to receive the next tide. It is the optimum tidal action that supports the maximum life in the river. This is when the species run into the river. This is particularly relevant to the smelt movement and salmon migration. You could say on an incoming tide 10 cumecs becomes 5 cumecs going to sea and on an outgoing tide it become 15 cumecs. In fact, it is more dynamic and variable than this depending on ocean and weather conditions and the positioning of the river mouth etc. Take 30 cumecs from the tidal reach and you have a significant effect, take another 20 cumecs and habitat (Wetted area) is further reduced, take out 60 cumecs all together and you haven't got the same river.

11. The relevance of declining populations.

- 1) Common Smelt. While over the breeding season millions of smelt still run in the lower reaches of the Rangitata overall these runs are only a shadow of earlier years. Five generations of my family have fished with the smelt (silveries) for sea run trout at the Rangitata River mouth and every year for over sixty years I have taken my net and caught them. In recent years, as bait, they have become harder to catch and the runs have been more spasmodic. I recall in earlier years the species were harvested commercially where they were dried and exported. For weeks there would be a black line in the water as the silveries migrated up stream. It was easy to fill the net. Today at times they still run like that, but I would not suggest for a moment the numbers are sufficient to sustain a commercial operation. It is hard enough, to at times, catch a dozen smelt to go trout fishing let alone the tons needed in a commercial operation.
- 2) White fronted terns. For me their presence in the early spring marks the beginning of a new season. New hope!! Thirty / forty years ago, in October before sun rises, thousands would take to the skies from the river flats, the sound of their call piercing and deafening. Still ringing in your ears after you left the river bank. Today, they are still there but the numbers are well down, so much so, that they seem to have lost their voice. This is one of the saddest changes – losing the call of the tern. I have seen it where I had to stop fishing with the silvery because 30/50/100 terns would be working over the area of my caste and I was just as likely to catch a tern as a fish. They still work the braids, 3/5/10 but the numbers are only a shadow of earlier years. They are a very special bird.
- 3) Black billed Gulls. Their numbers are like the terns- well down. Years ago, there were huge nesting colonies on the lower Rangitata. A mix of terns and gulls. As part of their customary right, I witnessed over a number of years, the local Runanga collecting the eggs from the colonies. This was a special event. These days this would not be possible. The nesting colonies are simply not there. This is not to say they have not nested in the area in the last ten years because they have. The numbers though are only a fraction of historical number and in my view would not support such a harvest.
- 4) Black fronted terns. While these nested and bred higher up the river, later in the season, in large numbers they use to descend and feed and roost on to the shingle islands in the lower river. They would fly in formations and these were quite a

spectacle. They would also hover over the streams feeding on insects. In recent years I still see these terns working the river and occasional they roost on the shingle bar but the flying formations and numbers as a spectacle is something for the history books.

- 5) Sea Run Trout. From my experience trout numbers are well down. Years ago, they would chase the silveries in the wash of the waves and as the wave receded on many occasions they would be left exposed flapping on the beach. This has not happened for years. My catches in recent years are only a fraction of the catches in earlier years. I could catch a limit bag of 12 in a morning. The daily limit is now 4 and this season I did not achieve a catch of 4 worthwhile trout. The drop off in the condition factor of the trout is an indicator that not all is well with the smelt population.
- 6) Salmon. I worry about the productivity of the Rangitata River. I know juvenile salmon numbers are well down. Traditionally when I splashed around catching the silveries for trout I would also catch salmon smolt in my net. Occasionally up to twenty in a scoop but more often just four or five. In the last year or two I haven't caught one. Not only would the terns feed on silveries they would also dive on the salmon smolt as they moved downstream – they were like guided missiles. This doesn't happen now days. Later in the season when fishing for salmon, precocious juveniles would take my spinner. Perhaps two or three in a morning. This rarely happens now. In the evening you would see the smolt feeding at the ends of the runs in the river – this doesn't happen. These are my indicators that numbers are well down, and the productivity of the river is at an all-time low.
- 7) In my view there is not one single factor that you can put your finger on and say this is the cause of the declining population. Some of the species have been living in the Rangitata environment – most likely for thousands of years. The populations have always been vulnerable, and many live in the delicate balance of life v death. Many of the changes we have made to the environment are subtle and hard to determine and on a tidal or seasonal basis there appears to be no difference but over time the changes in populations have become easy to assess. There is a principle take away the habitat of a species and you will take away the species. How much difference taking away an additional 10 cumecs will make is anyone's guess. It is possible that it has taken 70 years to see the effect on habitat and populations of the first 30 cumecs taken from the Rangitata, let alone the recent additional 20 cumecs of

South Rangitata. I cannot see how 60 cumecs taken will not have further impact on populations. This extra take is being promoted in circumstances where there are declining populations. One of the dictionary definitions of subtle is 'tenuous'. How the populations survive now, is tenuous, some like the salmon may be hanging on by a thread. Any change in water flows may be subtle but in relation to the survival of the species may be better understood as tenuous because over the time of the consent it may be this change that is the population tipping point.

- 8) The living breathing river is at its best at the time of the Spring - early Summer thaw when traditionally there is movement in the tides and the species are feeding and breeding. I ultimately worry about their survival as the winter snows diminish and our glaciers retreat. The underlying snow melt hydrograph is gradual and feed the groundwater and river systems over a long period of time and with that supports flows on which the species survive. How much the impact of climate change will have on various populations is hard to know. Rain and flash floods v the snow melt and will there be the precipitation at crunch times of low flows in the autumn months? Less snow in a snow fed river, is a worry.
- 9) Declining populations of sports fish species means less people fishing in the lower areas of the river that I fish. Early photographs show the picket fence at the river mouth – One hundred anglers on the river at daylight and 60 salmon caught in a morning in the 1970's was not an uncommon occurrence. This season there may be 20 anglers fishing in a morning and may be 1 salmon caught. New Zealand had a culture, a heritage of the great outdoors and in our district salmon fishing was a pursuit that over the season attracted thousands of anglers. They came to fish from all over New Zealand and further afield, – if the river was dirty they would fish the clear sea – if the sea was dirty they would try lure fishing in the dirty water. You got to know the sweet time of the runs as the river flows fell below 200/180 cumecs or whenever the heavy silt dropped out. You got to know where the flush of salmon would be after a fresh, whether 3/6/9 kms up stream on their migration run. (Depending on the number of days it took for the river to clear). They migrated through the tidal areas under cover of the higher coloured water. My greatest success was when I targeted these upstream reaches as the river cleared enough to spin fish. The 10 cumecs take is about less water, less incentive to migrate especially in the migration months of January and February and warm weather conditions.

Conclusion – The application for an additional 10 cumecs from the Rangitata River should be declined because the river is already compromised, species are in decline and the priority should be to protect what we have left – otherwise as I fear we are heading for a silent spring. This is in circumstance where in my view the applicant does not really need the water.