

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of an application pursuant to Section 201 for a Water Conservation Order on the Hurunui River.

**STATEMENT OF SUPPLEMENTARY AND REBUTTAL EVIDENCE OF MARTIN UNWIN
ON BEHALF OF
NORTH CANTERBURY FISH AND GAME COUNCIL
Dated 9th day of April 2009**

1. I prepared a first statement of evidence dated 6 March 2009, in respect of Fish and Game's application for a Water Conservation Order on the Hurunui. I confirm the detail of my experience and qualifications set out therein.
2. In this statement of evidence I comment on the final 2007/2008 survey report, and I set out my comments in rebuttal in respect of the evidence of Bruce Norrie on behalf of the Hurunui Water Project.

2007/2008 National Angling Survey report

3. The final 2007/08 survey report, which I will provide in pdf as soon as it becomes available, includes a table listing "cross-boundary fishing", i.e., effort spent by anglers fishing in a region other than that in which they purchased their licence. I would recommend the Tribunal study this, and would draw their attention to the following:
 - a. 78% of all angling in NZ involves anglers fishing within their home FGZ region;
 - b. 17% of angling effort is expended in a geographically adjacent Region (e.g., Wellington, Hawkes Bay)
 - c. 5% of angling is expended in a more distant Region (e.g., Wellington, North Canterbury)
 - d. North Island anglers expend 5.1% of their total effort in the South Island
 - e. South Island anglers expend 0.9% of their effort in the North Island (excluding the Taupo region)

4. A more whimsical but accurate way to illustrate this, which I have used before and should have mentioned in response to Dr Closs' question, is based on the relative popularity of angling in different parts of NZ. If you live in Auckland, you go sailing, sea fishing, or cruise the local beaches. If you live in Wellington, pray for the Hurricanes to get their act together. And if you live in the rural South Island, you go fishing, making use of whatever resources are available within a convenient distance of home. It's as simple as that. This interpretation is consistent with the large variation in per capita licence sales throughout New Zealand, particularly the low participation rates in Auckland and Wellington.
5. Analysis of notional travelling distances, taking into account where each individual angler lived and where they fished (Unwin & Deans 2003), supports this observation. The median travel distance for anglers in the 2001/2002 survey was 43 km, i.e., half of all fishing occurred within 43 km of home. Of 87 rivers for which mean travel distance could be reliably estimated, only 11 were characterised by a median travel distance exceeding 100 km. Travel distances from central Christchurch to the upper Hurunui River are roughly 105 km (to the confluence with the South Branch) and 120 km (to the road end at Lake Taylor), placing the fishery in the top 10% of New Zealand river fisheries with respect to remoteness from angler's homes.
6. Mr Brian Ross, in his evidence on behalf of the applicant, refers to shifting patterns of angler activity in the North Canterbury region, particularly in relation to lowland river fisheries. To help illustrate this point, Table 1 shows usage estimates for lowland rivers in four North Canterbury catchments over the period 1994/95 to 2007/08, including the combined Lake Ellesmere / Selwyn River catchment.
7. Viewed at regional scale, total effort on these rivers declined markedly from 1994/95 to 2001/02, with some evidence of a slight increase from 2001/02 to 2007/08. When viewed at individual catchment and river level the trends are more variable, but suggest a consistent decline in the Ellesmere / Selwyn catchment, a moderate increase in the Ashley River, and generally downward trends within the lower Waimakariri catchment. This pattern generally echoes that found in other FG NZ regions, as detailed in the full survey report (Unwin 2009).

Rebuttal, Bruce Norrie, evidence dated 23 March 2009

8. At paragraph 16 Bruce Norrie argues that "...a dam on the south branch would not lessen the future salmon numbers in the total Hurunui River system for spawning...

Later in the spawning season when the irrigation slows down the river will be controlled at a lower flow giving more areas for spawning below the dam site. This will help the salmon fishery as many salmon don't spawn until later April and during May."

9. The factual basis for this statement is unclear. Of the many counter-arguments one could advance, the following two points seem the most relevant in the context of the present hearing.
10. First, the distribution of Chinook salmon spawning sites in New Zealand clearly indicates that they are highly selective in their choice of spawning habitat. All sites used by Chinook salmon are also used by brown trout, but – whereas brown trout are ubiquitous – Chinook are restricted to a few well defined and generally localised sites. Indeed, it is for precisely this reason that ECan has sought to establish an inventory of Chinook spawning habitat in the Canterbury Region (Unwin 2006).
11. I can offer a personal perspective on the extent to which Chinook salmon appear to make very specific choices as to where they spawn based on a visit to Argentinian Patagonia in March 2008. Sea-run Chinook salmon have recently penetrated into southern Argentina via southern Chile and the Straits of Magellan, but have colonised exactly one catchment with a spawning population limited to a ~5 km length of one headwater tributary. By contrast, sea-run brown trout and steelhead trout are found in many rivers draining to the Argentinian Atlantic, where they form the basis of a well established sports fishery.
12. Second, Mr Norrie does not cite any evidence to back up his assertion that flow regulation associated with operating a dam on the South Branch would enhance spawning habitat below the dam. In addition, this claim is made without reference to any loss of spawning habitat above the dam, or to any reduction in the viable spawning population should upstream passage facilities at the dam fail to operate correctly, as suggested by Dr Vaughan Keesing in paragraph 101 of his evidence on behalf of the Hurunui Water Project. It is true that a well-designed fish pass may allow spawning fish to reach the South Branch spawning grounds in good condition, but this cannot be assumed. The New Zealand experience with maintaining Chinook salmon spawning habitat below dams, as exemplified by the Clutha and Waitaki Rivers, has not been encouraging. In the case of the Waitaki River, it appears that subsequent generations have been able to spawn in the mainstem below the dam to good effect; in the case of the Clutha, only a relict spawning population remains.

Conclusion

13. Freshwater angling in New Zealand is primarily a local activity, conducted by anglers fishing locally. The upper Hurunui River is above the 90th percentile with respect to remoteness from home. This reinforces the observation in my original evidence (paragraph 59 and elsewhere) that usage of the upper Hurunui River is high given its remoteness, and that its relatively low usage by anglers from more distant parts of New Zealand should not necessarily be construed as reducing its value in a national context.
14. Effort devoted to lowland river fisheries in the North Canterbury region declined markedly from 1994/95 to 2001/02. It may have increased slightly from 2001/02 to 2007/08, but remains well below the 1994/95 figure.
15. Evidence to support claims that Chinook salmon spawning would be enhanced below a dam on the Hurunui South Branch is lacking. On the contrary, this species appears to be highly selective with regard to spawning habitat, as is recognised by ECan and evidenced by the highly localised nature of the main spawning waters in New Zealand and (most recently) Argentinian Patagonia.

References

- Unwin, M.J. (2006). Assessment of significant salmon spawning sites in the Canterbury region. *NIWA Client Report CHC2006-097*. 33 p.
- Unwin, M.J. (2009). Angler usage of lake and river fisheries managed by Fish & Game New Zealand: results from the 2007/08 National Angling Survey. *NIWA Client Report CHC2009-046*. 47 p.
- Unwin, M.J.; Deans, N. (2003). Travel distance as an index of angling value: a preliminary study based on the 2001/02 National Angling Survey. *NIWA Client Report CHC2003-113*. 24 p.

Martin Unwin

9 April 2009

Table 1. Estimated annual usage (angler-days \pm 1 standard error) of lowland river fisheries in four North Canterbury catchments, 1994/95 – 2007/08.

Catchment	River	1994/95	2001/02	2007/08
Waipara	Waipara River		80 \pm 50	120 \pm 80
Ashley	Ashley River	4 530 \pm 1 050	3 520 \pm 680	5 430 \pm 2 020
	Saltwater Creek		110 \pm 100	50 \pm 30
	Glentui River	210 \pm 120		
	Waikuku Stream		190 \pm 190	
	<i>Total, Ashley catchment</i>	<i>4 740 \pm 1 060</i>	<i>3 820 \pm 720</i>	<i>5 480 \pm 2 020</i>
Waimakariri	Kaiapoi River	5 250 \pm 2 150	1 800 \pm 460	3 760 \pm 1 190
	Cust River	360 \pm 190	40 \pm 30	760 \pm 340
	Waimakariri South Branch	2 560 \pm 690	290 \pm 100	560 \pm 360
	Styx River	440 \pm 190	710 \pm 310	440 \pm 230
	Cam River	1 580 \pm 1 070	120 \pm 80	160 \pm 90
	Courtenay Stream		10 \pm 10	140 \pm 100
	Silverstream	1 400 \pm 620	320 \pm 150	20 \pm 20
	Eyre River	80 \pm 50		
	Kowai River	10 \pm 10	270 \pm 170	
	Ohoka Stream		120 \pm 110	
	<i>Total, Waimakariri catchment</i>	<i>11 680 \pm 2 590</i>	<i>3 690 \pm 630</i>	<i>5 840 \pm 1 310</i>
Ellesmere/ Selwyn	Kaituna River	90 \pm 90		
	Halswell River	1 760 \pm 880	220 \pm 130	460 \pm 180
	Harts Creek	1 010 \pm 520	480 \pm 120	630 \pm 330
	L II River	2 130 \pm 1 110	680 \pm 290	590 \pm 250
	Selwyn River	6 700 \pm 1 370	2 130 \pm 540	1 000 \pm 300
	Hawkins River	210 \pm 140	80 \pm 50	
	Hororata River	160 \pm 130		
	Irwell River	430 \pm 240	30 \pm 30	
	<i>Total, Ellesmere/Selwyn catchment</i>	<i>12 490 \pm 2 060</i>	<i>3 620 \pm 640</i>	<i>2 690 \pm 540</i>
Total, all rivers		28 910 \pm 3 470	11 210 \pm 1 150	14 120 \pm 2 470