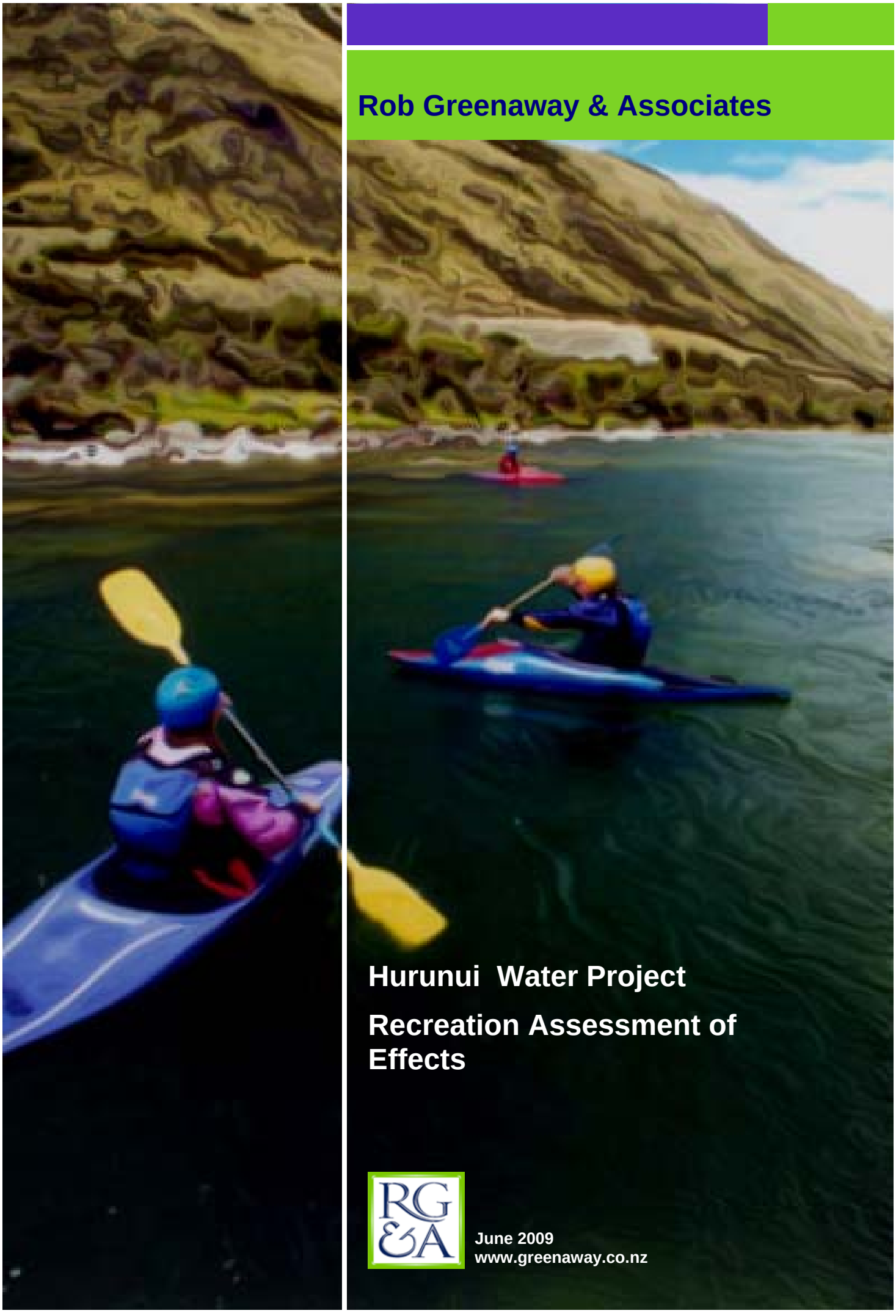
Rob Greenaway & Associates



Hurunui Water Project

Recreation Assessment of Effects

June 2009

www.greenaway.co.nz

Hurunui Community Water Development

Recreation and Tourism Assessment of Effects

Contents

1 Introduction

The proposal considered in this study is for an irrigation project on the Hurunui River, incorporating a high dam and reservoir on the Hurunui South Branch, a weir on Lake Sumner, and augmented seasonal flows in the main stem of the River, allowing for seasonal irrigation off-takes in the River below the Mandamus confluence.

This report describes the main recreational uses of the study area, defines its significance to recreation and assesses the effects of the proposal.

1.1 Objectives

- Identify, locate and review the recreation values in the study area, and assess their significance,
- Review the impacts of the operation of the proposal on the identified recreation values and describe the likely changes to the recreation setting,
- Report on the scale of effect of the proposal on recreation and identify the potential to avoid, remedy or mitigate important adverse effects.

1.2 Study area

The study are includes the entire Hurunui River catchment, but focused on those areas directly affected by the proposal - Lake Sumner, the Hurunui South Branch and the Hurunui River.

1.3 Method

This study is based on:

- A comprehensive literature review including relevant recreation studies, national and regional policy documents and strategies, popular recreation and tourism guides and internet resources,
- Site visits to the study area and other regional recreation settings,
- The review of project designs and parallel technical reports (such as landscape, hydrology and aquatic ecology), and communication with their authors,

The author completed a survey of recreational activities in the Hurunui catchment for Environment Canterbury and the New Zealand Fish and Game Council in 2001 (Greenaway 2001). He has previously completed two preliminary reports on the values of the study area for irrigation assessments and presented evidence for Fish and Game at the Hurunui Water Conservation Order hearing in 2009.

2 The proposal and assessment dependencies

The Pattle Delamore Partners report *Assessment of Environmental Effects: Hydrology and Irrigation Demand for the Hurunui Water Project* (Pattle Delamore Partners 2009) describes in detail the water storage and irrigation proposal.

The key elements of the project include:

- An intake on the Hurunui River downstream of the confluence with the Mandamus River
- A control gate structure at the outlet of Lake Sumner which will control the lake level in order to provide storage for irrigation
- A dam and consequent reservoir in the Hurunui River South Branch to provide storage for irrigation
- A distribution network of water races across the plains providing water to all shareholder properties in the scheme

Lake Sumner is able to provide 27 million m^3 of active water storage, and the proposed dam on the Hurunui South Branch, 111 million m^3 (Pattle Delamore Partners 2009).

This assessment considers the effects of only the weir on Lake Sumner, and the dam and reservoir on the Hurunui River South Branch. Consequent effects of these structures relate to potential effects on:

- The trout and salmon fisheries in, or affected by the hydrology of, the Hurunui River, Hurunui River South Branch and Lake Sumner
- The flow regime in the Hurunui River main stem, with two sections considered: above and below the South Branch confluence
- Lake levels in Lake Sumner
- Access from Lake Sumner to the Hurunui River main stem

This assessment is therefore dependent on the:

- Hydrology assessment carried out by Pattle Delamore Partners Ltd (2009) for the description of the likely flow regime in the Hurunui River above and below the South Branch confluence, and the lake level regime in Lake Sumner
- Landscape assessment of effects carried out by Peter Rough Landscape Architects (2009) in relation to effects on visual amenity of the lake level management regime on Lake Sumner
- Aquatic ecology assessment of effects carried out by Boffa Miskell Ltd (2009) in relation to instream habitat for trout and salmon and the effects of the Lake Sumner weir, Hurunui River South Branch dam and the managed flow regime in the Hurunui River

The relevant outcomes of these reviews are summarised in the following sections.

2.1 Hurunui River flow regime above South Branch confluence

The management of the weir structure on the Lake Sumner outlet aims to reach a maximum storage level by the end of August and to release augmented flows during the peak irrigation period in February through to April, with some minor irrigation releases in September. Outflows would be reduced during August but there is the potential for the mean daily flow to increase between October through January as storage capacity in the Lake is exceeded. Flows would also increase during the irrigation period. For example, Figure 1 (Pattle Delamore Partners 2009, Figure H4)

depicts the flow duration curve for the month of October showing a small increase (~8%) in the frequency of flows between 75 and 100 m^3/s and a similar decrease in flows below 60 m^3/s. This change in flow pattern is similar for the months of September and November. Figure 2 shows the flow duration curve for January, which is also illustrative of the modelled flow changes for December and February – a minor increase in flows above 50 m^3/s and in the 25 to 40 m^3/s range. Mean flows do not change in March, but in the six months prior are up to 3 or 4 m^3/s higher. Pattle Delamore Partners (2009) shows little change in the general variability of flows from the Lake Sumner outlet.

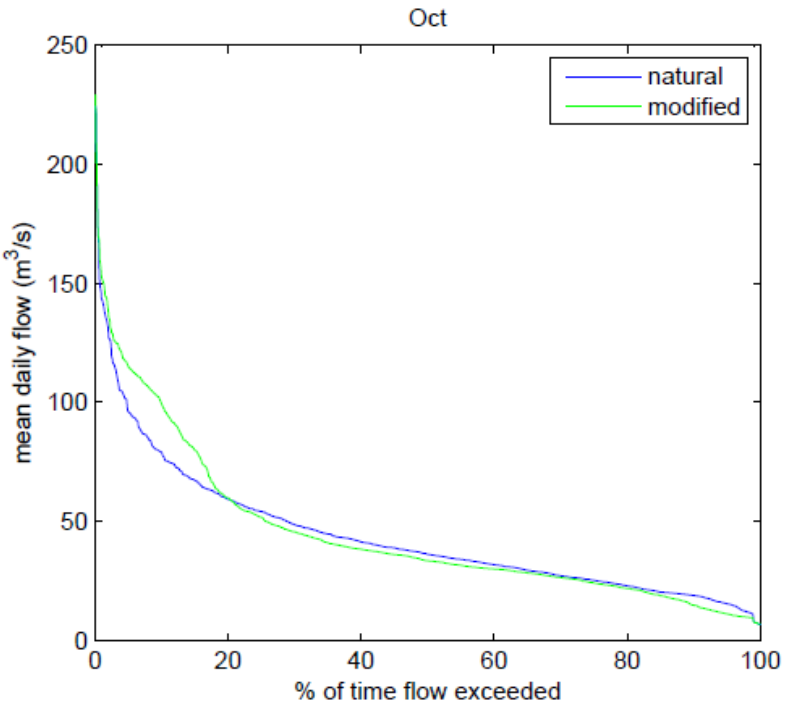


Figure 1: Modelled and natural Lake Sumner outlet flow duration for October

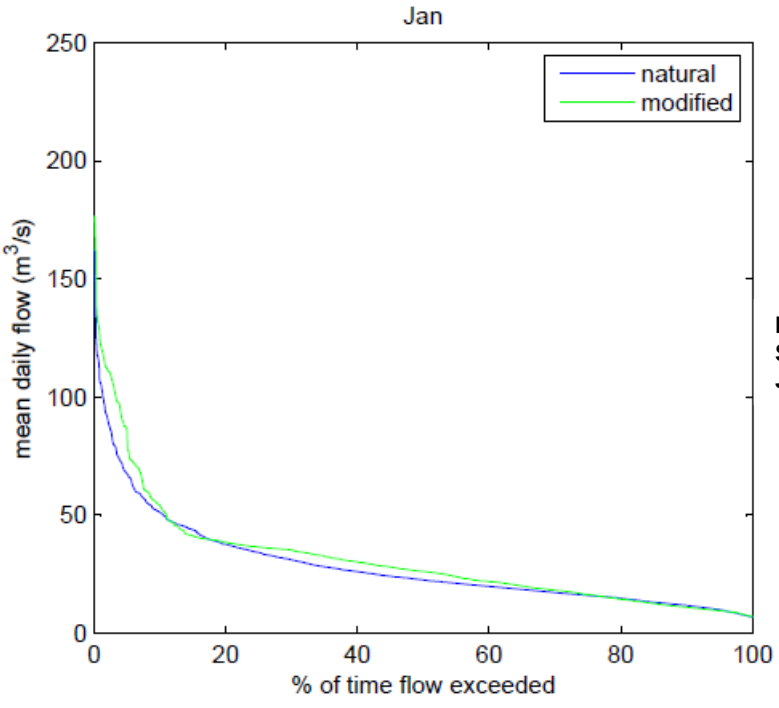


Figure 2: Modelled and natural Lake Sumner outlet flow duration for January

2.2 Hurunui River Flow regime below the South Branch confluence

Modelled flows for the Hurunui River main stem below the South Branch confluence, which includes Maori Gully, are taken from the flow recorder at Mandamus. Flow patterns here are affected by the storage and release of water from the proposed Hurunui River South Branch reservoir. Figure 3 (Pattle Delamore Partners 2009, Figure K4) shows the flow duration curve for October, which is typical of the modelled changes for the months of September and November. This shows a minor increase in flows above 100 m^3/s and a minor decrease in flows below that. Figure 4, for February, is typical of December through March, with an ~10% decrease in flows between 50 and 75 m^3/s and a more general tendency for flows to trend towards 50 m^3/s. The mean flow in January and February would increase by approximately 8 m^3/s.

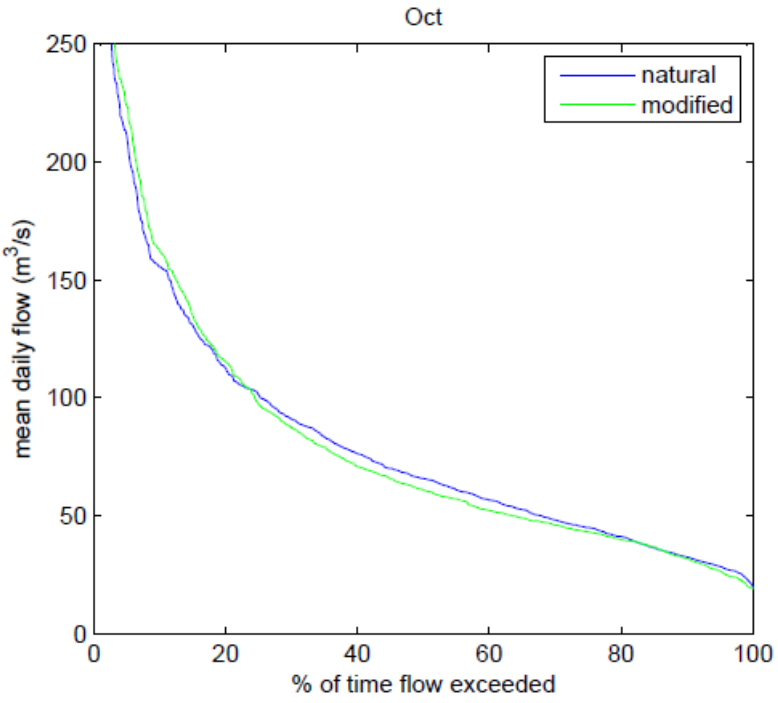


Figure 3: Modelled and natural Hurunui River flow duration for October at Mandamus

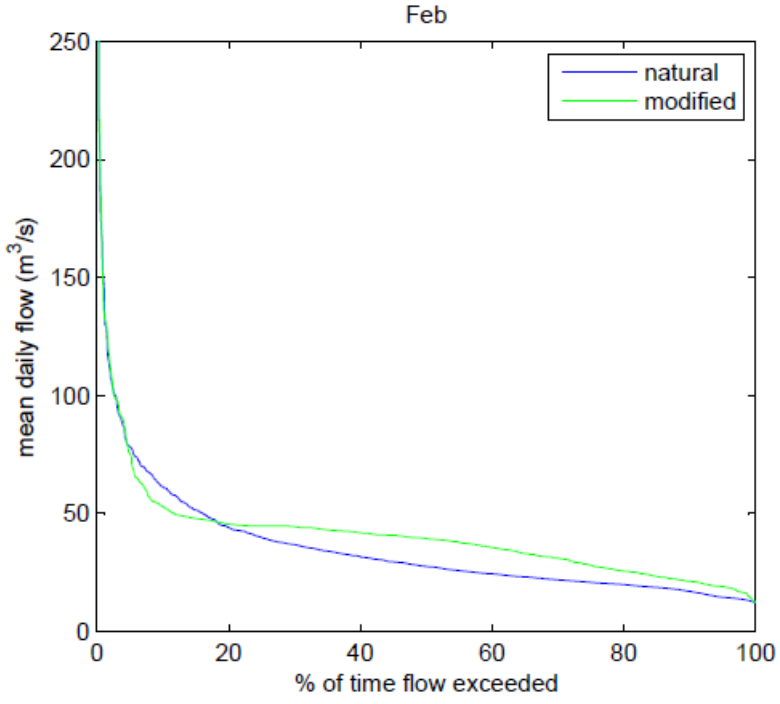
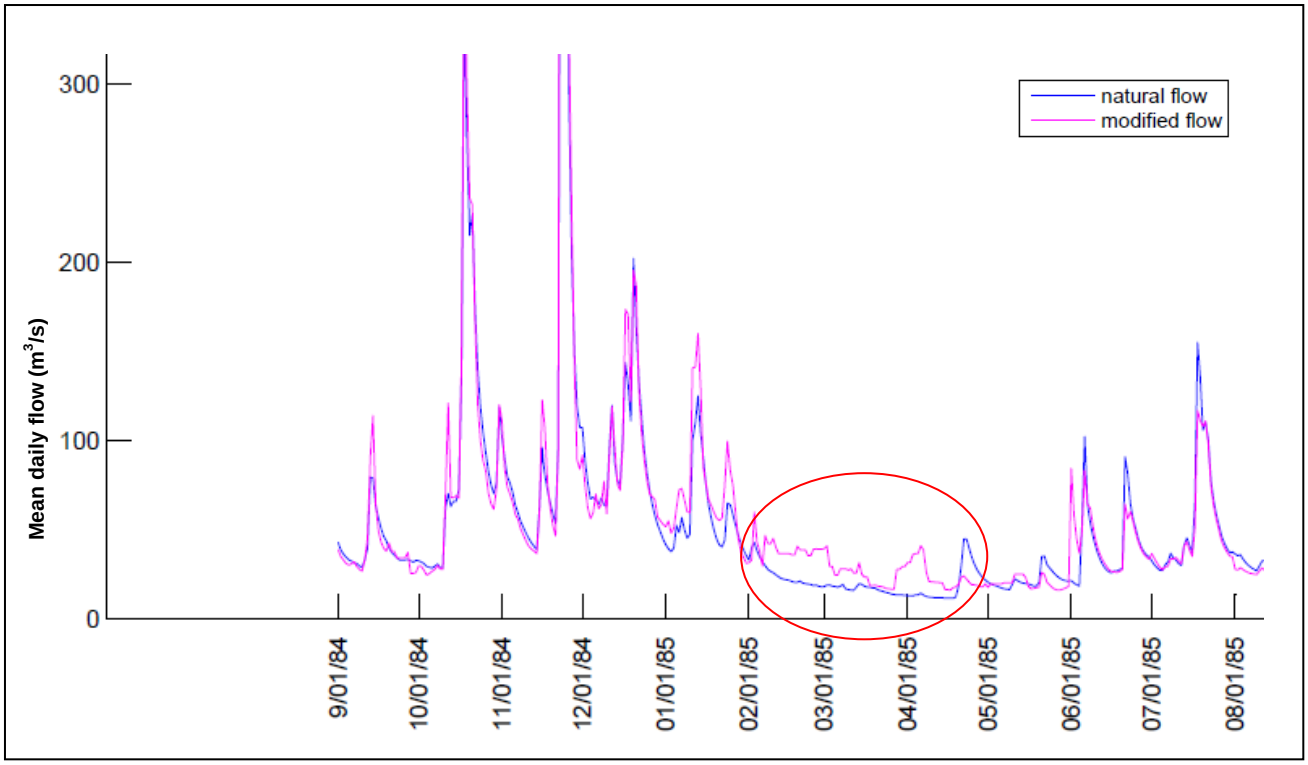


Figure 4: Modelled and natural Hurunui River flow duration for February at Mandamus

The most important change in relation to kayaking is the change in frequency of flows in the lower ranges, below 30 m^3/s, which are suited to beginner kayakers. This is shown in Figure 5, which is an extract from Pattle and Delamore (2009) Figure M4; an overlay of natural and modified flows in the Hurunui River at Mandamus. Circled in red is January to March period showing the potential for very low flows in late summer to be replaced with moderate flows. This modelled year will not necessarily be typical, but shows the potential scale of change.

Figure 5: Modelled and natural Hurunui River flow at Mandamus



2.3 Hurunui River South Branch

The proposed reservoir on the South Branch will be periodically drawn down completely – five of such seasons are identified in the 36 year simulation period (Pattle and Delamore 2009). The reservoir discharge will be characterised by periods of minimum flow as the reservoir is filled, particularly from April through to November, followed by augmented flows during the irrigation season. Mean monthly flows at Esk Head may be elevated during January and February, 6 m^3/s above that currently experienced.

2.4 Lake level regime on Lake Sumner

Levels on Lake Sumner are modelled to be held at consistently higher levels for relatively long periods. This is shown in Figure 6, which is an extract from Pattle and Delamore (2009) Figure G8. This illustrates the tendency for Lake Sumner to have a stable high level for months at a time. Lower levels generally coincide with draw down during the irrigation season or when the control gates are opened in June and July with outflows generally matching natural flows.

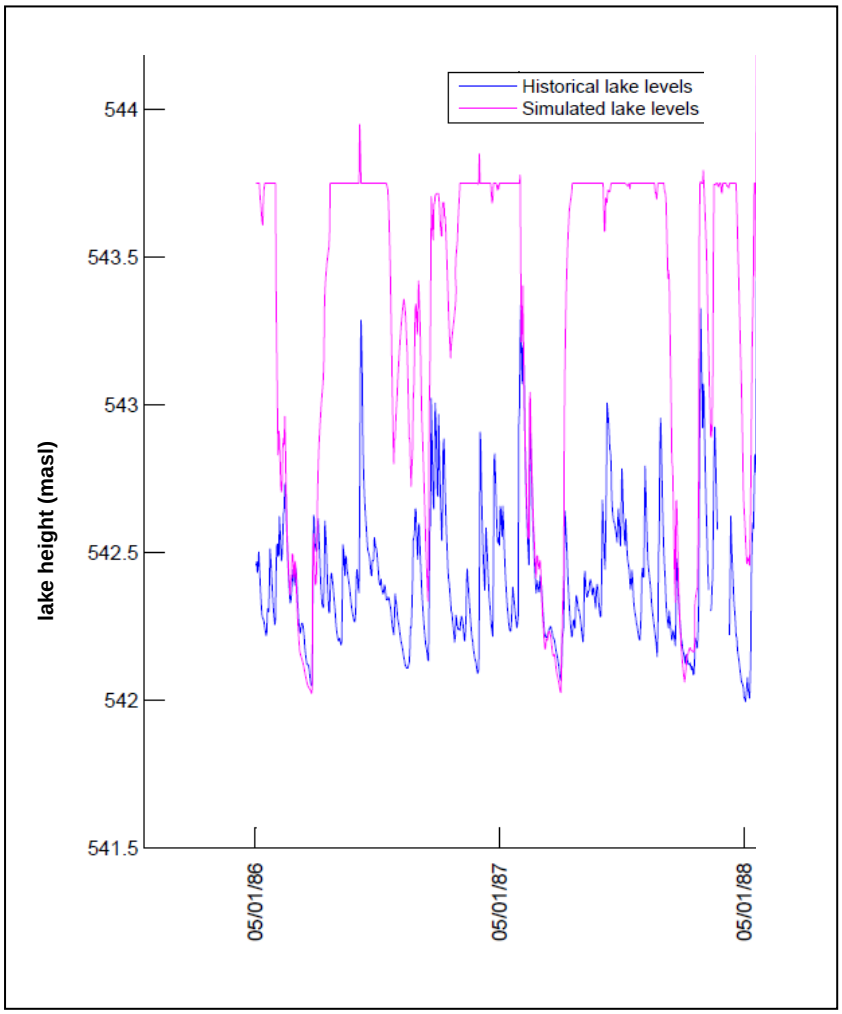


Figure 6: Modelled and natural lake level for Lake Sumner

2.5 Effects of lake level regime on visual amenity

Effects on the visual amenity values of a recreation setting may have no direct effects on recreation potential (that is, the ability to undertake and activity), but they may affect the quality of the recreation experience. It is, however, difficult to correlate the scale of effect as assessed by a landscape specialist with changes to the recreation experience. In the case of the Hurunui, some kayakers, for example, may be attracted more by the quality of the rapids *per se* in a setting, and others may focus more on the natural qualities of the surrounds. The concepts of visual amenity and recreation opportunity are, nonetheless, tightly entangled. Where a landscape specialist identifies an adverse effect on visual amenity, there is likely to be some corresponding change in recreation enjoyment at a personal level.

Peter Rough Landscape Architects (2009) considers that the proposed weir at the Lake Sumner outlet will have a significant effect on natural character and visual amenity in the immediate area.

Effects on visual amenity resulting from the more consistently high level of Lake Sumner are described as likely to be felt more strongly by those with better long-term experience of the setting, while visitors who are not familiar with the setting will view the Lake area as visually appealing despite the changes. This assessment takes into account effects on lakeside vegetation described in Boffa Miskell (2009).

The Canal between Loch Katrine and Lake Sumner will be inundated at high lake levels and lost from view for these periods. Peter Rough Landscape Architects (2009) describes this change as 'not lacking in high visual amenity value'.

The baches at Loch Katrine as described as unaffected by the raised Loch levels, although one section of road accessing the area would require relocation and rehabilitation.

In summary, Peter Rough Landscape Architects (2009), describes the changed lake levels as representing a naturally occurring event, albeit for prolonged periods, and therefore it will not adversely affect visual amenity values beyond the site of the weir.

The proposed dam on the Hurunui River South Branch is described as having a significant effect on the natural character of the upper end of the gorge and the River's middle reach. However, the impoundment has the potential to sustain visual amenity values in the valley of the River between Bell Knoll and the gorge.

The Peter Rough Landscape Architects (2009) assessment states that the character of the Hurunui River itself will appear to be highly natural with the modified flow regime in place.

2.6 Effects of regime on trout and salmon

Boffa Miskell (2009) reports no important effects of the proposal on the quality and quantity of trout in the Hurunui River and in Lake Sumner. No assessment of effects on the salmon fishery have been assumed due to the ability to retain fish passage into Lake Sumner and the lack of salmon spawning activity in the Hurunui South Branch.

3 Summary of recreation values and assessment of effects

This section summarises the main recreation activities in the study area, reviews their significance and presents a description of the recreation effects of the proposal.

3.1 Main recreation activities, locations and their significance

Four main recreation settings in the study area have been identified:

- The Hurunui River South Branch angling and kayaking setting (very low use due to private access requirements)
- Lake Sumner, an important multi-use recreation setting
- The main stem of the Hurunui River above the Mandamus confluence, primarily an angling, jet boating and kayaking setting
- The Hurunui River below the Mandamus, largely an angling and jet boating setting with some kayaking; and salmon and whitebaiting at the river mouth

The Hurunui River is widely agreed to represent a nationally significant kayaking and angling experience particularly in the upper reaches, and including Lake Sumner. Lake Sumner supports a range of aquatic and terrestrial recreational activities, including tramping, boating, horse trekking and boating. The salmon angling and whitebait resource is regionally important. The South Branch is largely inaccessible to recreation, with access contingent on landowner permission or helicopter access. Its angling resource is little used. Jet boating is popular on the River and while the setting below Mandamus is of only regional significance at best, the section between Mandamus and Lake Sumner presents a challenging boating option which has been described as of national significance. Flow variability is a key component of the ability of the Hurunui River to sustain a high level of interest from individual kayakers over long periods and as their skill levels advance.

3.2 Assessment of effects

The assessments refer to effects that are considered to be 'minor', 'more than minor' or 'significant':

- A 'minor' effect refers to a slight change in the recreation setting, but where the original recreational activities can continue. This scale of effect is defined as much by the definition for 'more than minor' and will relate to slight changes in the availability of the activity (such as the number of days it is possible) or its location. The activities' original qualities will remain largely unchanged. For example, a remote experience will remain remote.
- 'More than minor' refers to an activity opportunity where a shift in the recreation setting may modify the characteristics of an activity – such as the frequency it may be undertaken, the location of the favoured sites, and some of the activity's qualities – but the activity setting retains many of its original values and the activity may continue to be pursued.
- A 'significant' effect would refer to an activity opportunity that was removed (the potential of the setting for that activity would be significantly diminished).

Both 'minor' and 'significant' effects are generally easily identified. The scale of effect within which a 'more than minor' assessment can be made is more broad, and some interpretation of the type

and degree of effect is necessary. For example, where a 'more than minor' effect is at the major end of the scale, an activity might be described as 'severely restricted'.

Five effects are considered:

- A modified lake level regime on Lake Sumner, tending towards more stable and higher levels leading into summer, and a progressive lowering over the irrigation season.
- The construction of a weir at the outlet to Lake Sumner.
- A modified flow regime in the main stem of the Hurunui River upstream of irrigation abstractions below the Mandamus confluence.
- The construction of a high dam on the Hurunui River South Branch, with a large impoundment flooding the South Branch valley.

Table 1 summarises these locations, the activities affected, the scale and type of effect and the mitigations possible

Table 1: Summary of activities and effects

Setting	Activities and their significance	Effects and their scale
Lake Sumner	Angling – national	Reduction in access along beaches and reduction in their availability for fishing as a result of consistently high lake levels. Effect is potentially **more than minor**
	Boating – regional	Reduction in areas of beach available for shore-based activity and water skiing launching. Effect is potentially **more than minor**
	Tramping, camping, horse trekking – regional	Reduction in beach access opportunities. Effect is potentially **more than minor**
Lake Sumner outlet	Boating – regional / national	Impediment to access from Lake Sumner to River. Transport of boats around the structure will not be possible. Effect is **significant,** although the level of use of this setting is unclear and may not be great.
	Kayaking – national	Impediment to access from Lake to River. Portage will be easy. Effect is **minor**
Hurunui River above Mandamus	Kayaking – national	Minor changes to variability in flow regime. Effect is **minor**
	Trout fishing – national	Effect is **minor or less**
	Jet boating – national/regional	Access from Lake Sumner is lost and also egress from the upper River to the Lake. Effect is **more than minor**
Hurunui River South Branch	Trout fishing – low use	Change of privately accessible river-based trout fishery to lake fishery. While the effects on the setting will represent a major shift, the net effect on trout angling in the catchment will be **minor**

Table 1: Summary of activities and effects		
Setting	**Activities and their significance**	**Effects and their scale**
	Kayaking – low use	Reservoir will remove an infrequently used kayaking resource. Flow regime below Esk Head will feature greater variability with periods of minimum flow and relatively high releases during the irrigation season. The kayaking resource created by these more consistent high flows has not been assessed.
Hurunui River below South Branch confluence	Angling – national	Effect on habitat is minor or less. Some changes to anglibility may result due to change to frequency of some low flows. These are likely to be **minor**
	Jet boating – regional	Reduction in frequency of low flows may have a positive effect. At most, effect will be **minor**
	Kayaking – national	Reduction in frequency of flows suitable for beginner kayakers over the late summer period is likely to have a **more than minor** effect on this kayaking subgroup. The general effect on kayaking is likely to be minor.
Entire catchment	Introduction of a controlled lake level and river flow regime	The effect of a controlled river setting reduces the concept of a wild and natural recreation setting. While there may be limited effects on recreation potential, the knowledge of an artificial regime will diminish the inherent value of the setting to many recreational users. This is difficult to quantify in terms of scale of effect as it might not change the number of recreation days counted in the setting. This psychological effect may be **minor or more than minor**

3.3 Mitigations

The most important effects are those on beach use at Lake Sumner and the reduction in availability of flows suitable for kayak training in Maori Gully. Mitigations onsite may include development of improved access (get-in and get-out) to the River immediately below the Lake Sumner outlet for kayak training, and the development of additional beach-based recreation settings at some locations around Lake Sumner. These may reduce the scales of effect on recreation potential to minor, although the reduction in general access to and along the Lake Sumner shore may still retain more critical adverse effects for angling and boat-based recreation.

Public access to the reservoir on the Hurunui South Branch, and the river above the reservoir, would add to the recreation potential of the post-development setting generally.

3.4 Effects summary

It may be possible to reduce adverse effects of the proposal on recreation potential to minor, although shore-based recreation on Lake Sumner may retain more than minor adverse effects. However, the effect on the enjoyment of the setting as a result to the change the psychological setting will not be able to be mitigated. While this adverse effect may soften over time, the short-term effect (at least) on the recreation setting will be characterised as negative.

4 Activity summaries

The literature in this section is drawn from, in the main, popular guides and websites, with the intention of describing the use of the study are for the main relevant recreational activities.

4.1 Trout fishing

The Sports Fishing Regulations 2006-07 requires adherence to different rules for different sections of the river:

- Hurunui River, between Lake Sumner and South Branch confluence. Season 1 Oct – 30 Apr. Spinner/fly only. Daily limit, two trout, no salmon.
- Hurunui River, above Lake Sumner. Season 1 Dec – 30 Apr. Spinner/fly only. Daily limit one trout, no salmon.
- Hurunui River, below the South Branch confluence. Season All year. All legal methods. Daily limit two trout, two salmon.
- Hurunui River, South Branch. Season 1 Oct – 30 Apr. Spinner/fly only. Daily limit one trout, no salmon.

The Hurunui catchment is not listed in Kent and Madsen's 2003 edition of *New Zealand's Top Trout Fishing Waters*, although he gives an extensive review of the catchment in his more comprehensive guide to the South Island's river (Kent 2006). In reference to Lake Sumner and its neighbouring lakes he states (pp147-148):

> *All lakes contain brown trout, although rainbows have been introduced into Lake Sumner in the past. Quinnat salmon also enter Lake Sumner from the Hurunui River from February to April. Lake Sumner is by far the largest lake, with an area of 1364 ha. Most trout are caught by trolling from boats, although the catch rate is not high in this lake. Sight fishing for cruising fish is best around the Hurunui delta at the top of the lake.*

Kent offers an extensive review of angling on the Hurunui River. In reference to access he states (pp149-150).

> ***North Branch:*** *Headwaters By four-wheel-drive vehicle on the Lake Taylor to Lake Sumner track. It is wise to carry chains as the road becomes boggy and severely rutted after rain. A permit is required from DoC in Christchurch to open the locked gate at Loch Katrine. Upper reaches: The Lake Sumner road follows the river for some distance from the top of the gorge to Sisters Stream, where there is a track to the Hurunui River and a swingbridge. There are a few vehicle tracks to campsites on the river, but in other sections a scramble down a steep bank is required to reach the river. As described under Lake Sumner Forest Park, there is a private farm road to the outlet at Lake Sumner, but the Lakes Station charges a fee to use this.*
>
> ***South Branch:*** *Headwaters From Esk Head Station a rough four-wheel-drive farm track leads upstream to the Stony Hut. Permission is required from Esk Head Station. Lower and middle reaches can be accessed from the Esk Head road by walking and fishing upstream from North Branch confluence.*
>
> ***Main river:*** *Immediately below the confluence of the two branches, access can he obtained from the Lake Sumner road. However, the river soon gorges below where the river leaves the road and access through private farmland becomes very difficult. There is road access from Balmoral Road on the true left bank near the Mandamus confluence. SH 7 and SH 1 both cross the river. Ethelton Road follows up the true left bank from SH 1*

while Hurunui Bluff Road on the south side of the SH 7 bridge follows downstream on the true right bank.

His assessment of the angling resource is (pp150-152):

*In the **North Branch headwaters** above Lake Sumner there is a full day's fishing upstream from the four-wheel-drive track end at the swingbridge. There is also reasonable water downstream to the mouth at the lake. The river is moderate in size, clear, shingly and flood-prone, but holds some good-sized brown trout in the more stable water, which can be spotted and stalked on a bright day. The fish are easily spooked and will remain hidden for at least a day after being fished over. Catch and release in this section is recommended to conserve the gene pool. The river can be safely waded and crossed in normal conditions. The nor'wester often blows strongly downstream.*

*In the upper reaches of the **North Branch**, from the Lake Sumner outlet to the South Branch confluence, the river is large and clear and flows over a rock and gravel bed. The pools are very deep and often only the edges of the expansive runs can be covered with a fly. It is not an easy river to fish, as long casting is often required and the river is dangerous to cross and tricky to wade. The banks are covered with manuka scrub, bracken and grass, although the shoreline in most sections is stony. A few fish can be spotted on a bright day, but generally the river is fished blind with heavy stonefly nymphs or large attractor dry flies. This is not easy when the prevailing nor'wester is blowing directly downstream. Fish stocks are good, as drift dives reveal more than 50 large fish per kilometre of river. Because the river drains Lake Sumner, the water remains clear after a fresh although the fishing falls off when the river is high. If the flow rate in the main river is over 60 cumecs it is hardly worth fishing the upper reaches. There is a full day's fishing from the Sisters swingbridge upstream to the outlet.*

*The **South Branch** is smaller in size and offers good water in the lower section, especially early in the season before angling pressure makes trout very wary. The river is less stable than the North Branch and rapidly discolours after rain. There are few fish in the unstable gorgy section near the North Esk confluence, but high upstream near the Stony Hut there are 6 km of more stable water holding a few good-sized fish. These should be released if caught.*

***Below the confluence** of the two branches, the section above the gorge holds some excellent trout but these can generally only be reached by active anglers in low water summer conditions. The gorge itself is virtually unfishable as the river is very large, deep and well confined between steep rock walls.*

***From the Mandamus confluence** to the mouth, the river is large, shingly, braided and unstable, but the better water stilt holds some good brown trout. These are best fished to with a spinner, although when the river is low and clear there are some fly fishing opportunities. A lot of exploring or local knowledge is required to successfully fish these reaches as the pools and runs can change with each flood. Early in the season, providing the river is reasonably low and clear, some good browns can be caught under the willows. In December, there is often a run of sea-run fish and these can provide excellent sport.*

***At the mouth**, there is good salmon fishing in the surf during a run and it is not uncommon to land sea-run brown trout on salmon gear.*

Giles (2002) in his guide to fishing in the South Island, does not review the Hurunui catchment.

The text in Moore's Weekends are for Trout Fishing in New Zealand (2002) generally replicates that used on the Fish and Game website (or vice versa). This is not the case for the Hurunui River.

Moore describes the Hurunui as a 'reliably good brown trout fishery' and divides the River into three sections.

- The mouth, where sea run trout are found in the early part of the season.
- The middle reaches (access only is described)
- The upper reaches, where there is good 'back country fishing for anglers prepared to do some walking'. He notes that the north branch 'tends to be more stable and clear most of the time' and that a 'to km stretch holds high stocks of brown trout up to 3.5kg in deep pools and swift runs'. There are also 'some rainbows'. He notes, 'there are fewer fish in the headwaters of the south branch, which is subject to frequent flooding'.

Busch (2003) does not review the Hurunui catchment in his angling guide to the South Island.

4.2 Salmon fishing

Unwin (2009a) reports in reference to the Hurunui River salmon fishery:

> *The Hurunui River sustains the most heavily used salmon fishery in Canterbury after the four nationally important rivers (Unwin 2006), and the fishery has been ranked as regionally significant in all surveys which have been conducted over the last thirty years (Bonnett et al. 1991, Teirney et al. 1987, Teirney et al. 1982). Regionally significant salmon fisheries are characterised by annual spawning runs which generally number a few thousands but rarely if ever exceed ten thousand; angling effort is usually between two and ten thousand angler-days per year, with salmon angling predominantly confined to the river mouth and lower reaches; and are mostly fished by anglers travelling within their home FGNZ region (Unwin 2006). Salmon anglers show a strong preference for the lower and middle reaches of the Hurunui River (Teirney et al. 1987), with few salmon caught upstream of Mandamus (Bonnett et al. 1991).*

Millichamp's 1997 guide to salmon fishing in New Zealand is the most comprehensive popular guide to the sport. Millichamp is also a North Canterbury Fish and Game manager. Millichamp classes the Hurunui as a 'lesser river' in comparison with the major salmon waters of the Waimakariri, Rakaia, Rangitata and Waitaki Rivers.

Of the Hurunui salmon resource he writes (pp149–151):

> *Another little river and a very erratic fishery. In a good year the Hurunui will be one of the best fishing rivers in the country, whereas in a bad year only a few fish will be caught. The 1994-95 season was one of the best ever on the Hurunui. Twenty-odd fish were caught at the mouth nearly every day for 10 weeks in what was the most consistent fishing anywhere. 1 went there a number of times that season, and seldom came home without a limit bag. Surveys conducted by the North Canterbury Fish and Game Council that sea- son showed more fish were caught in the Hurunui than in the Waimakariri, despite the huge disparity in fishing pressure. The next season it all changed. On a typical day only one or two fish were caught, and only on a handful of days were good numbers taken.*
>
> *The interesting thing about the Hurunui is the number of tagged salmon caught here. Most of these originate from the Rakaia or the Waimakariri and are caught in the surf. One theory suggests that they pass by on the way to their natal river with no intention of running the Hurunui.*
>
> *The surf is the place to fish at the Hurunui mouth. The southern side tends to be better, but both fish well when conditions are right. Mid-December to mid-March, any time when the river is low and clear, is the best time to fish the Hurunui mouth. Some fish do get caught in the gut, usually only if the river is milky. A few salmon are caught there when the river is clear, but generally only during the first half hour of daylight.*

The Hurunui is often worth fishing when the other rivers are dirty. The outflow from Lake Sumner, which contributes a significant percentage of the Hurunui's flow, sends constant clear water into the river. Even when the river does flood, it generally clears within one or two days during the summer months. The Hurunui surf is also likely to be fishable when other surf areas are not. The water off the mouth is much deeper than at other river mouths and is more likely to be clear and calm. Whereas most surf areas can only be fished if the offshore swell is a metre or less, I have seen salmon caught at the Hurunui when the swell is over two metres!

Salmon can be caught upriver in the Hurunui but not to the same extent as in the bigger rivers. It is a good trout-fishing river and numbers of salmon are hooked by anglers intending to catch trout. Trout tackle represents the best bet anyway, given the low flows and water clarity which prevail in the Hurunui during the salmon run.

4.3 Whitebaiting

Kelly (1988) in An Inventory of Whitebaiting Rivers in the South Island, described the Hurunui as a 'popular local fishery' with 'small numbers of fishermen' and 'low' catch rates (p20). He described the river's whitebaiting resource thus:

> *Whitebaiting is concentrated around the river mouth and upstream along both sides of a long tidal lagoon. The river mouth area is usually fished by a dozen or so locals. However a number of fishermen's baches and a camping ground nearby draw whitebaiters from further afield during weekends and holidays. During a holiday weekend,, as many as 40 whitebaiters have been counted at the river mouth. Although this fishery is basically recreational, some whitebait is sold on the local market.*

Interviews with whitebaiters carried out by this author in 2001 indicate Kelly's assessment remains accurate. These interviews indicated that whitebaiting on the Hurunui River occurs between the river mouth camping ground and the river mouth - although the location of the mouth varies. Interviewees suggested that it is not an excellent whitebaiting river compared with the Waiau - which has good runs of 'bait - and the Hurunui was under more fishing pressure. However, the Waiau was reported as over-fished and was not well policed in terms of fishers complying with regulations (the setting of numerous un-manned nets and other illegal activities). The Hurunui was better policed.

On a busy day on the Hurunui there could be as many as 30 nets at the river mouth (described as 'nose to tail'). Whitebaiters are predominantly local or from Christchurch. Hurunui Huts residents are regulars. A few are from Culverden and Waiau.

The Hurunui season is 'short and sweet' but there are few large catches - with takes of half or one pound on some days. The season runs from 15 August to November 30. However, there is little activity until mid-September and early October. Fifty years ago reports of up to 143lb in a day on the Hurunui were made. Ten or 12lb would now be considered an excellent day.

There have been reported major changes in water quality and quantity on the Hurunui. During the 2000 season the amount of algae in the river meant nets had to be withdrawn from the water and washed every hour. The weed also affected salmon fishing and was washing along the beach, clogging lures. Fishers did not recall algae in earlier years. Flows were also much lower than recalled.

The Hurunui has excellent access (almost 'too good') compared with the Waiau, where a jet boat is needed to reach the river mouth.

There are several whitebait rivers in the region. The Waiau is dominated by jet boaters. The Conway (which has difficult access) and the Kahutara are minor sources - also Saltwater Creek and Motunau. The Rakaia and Waimakariri are OK but are well-fished by local fishers.

4.4 Rafting

Relevant interviews carried out in 2001 indicated that four commercial rafting operators were offering trips on the Hurunui River, mostly focused on the Maori Gully section, although two-day trips from the Lake Sumner outlet to the Seward River bridge were also possible. As an example, 100 clients were taken by one company (who claimed to be the most frequent user) through Maori Gully in the 200/01 season.

The minimum flow required is 6 cumecs. It can be rafted at 200 cumecs but the commercial cut-off is 100 cumecs. The Hurunui River was considered unique for its largely undisturbed flow and its environmental quality. Its grade makes it perfect for a commercial trip. Clients reported the scenery, environment and isolation as the main attractive features.

A current web search of operators offering rafting on the Hurunui is less productive. The New Zealand Rafting Association identifies only one relevant commercial operator: Rafting & Moore, based in Oxford[1]. They describe the Hurunui as Grade 3-4 and offer a five-hour day trip, with the blurb:

> *Description: Flows through an isolated sub alpine valley. Much of the attraction lies hidden in the Maori Gully, named after the people who once used the valley to cross the main water divide on their way to the greenstone mines of the west coast.*

The New Zealand Rafting Association also offers river rescue courses on the Hurunui[2].

Additional interviews would be required to assess contemporary rafting activity on the River. The activity is also carried out by schools engaged in training camps (see Section 3.1.5).

4.5 Kayaking, canoeing and river bugging

The late Graham Egarr, one of the authors of the *New Zealand Recreational River Survey*, penned perhaps the most comprehensive guides to kayaking and rafting in New Zealand. Two volumes were published, one focusing on the North Island and the other the South (Egarr 1995). In each he lists his choice of the best river trips and whitewater trips on each Island. The Hurunui River is listed as one of 37 'most popular' river trips (Maori Gully and Hawarden Gorge) and one of 15 of the 'very best of the difficult whitewater trips' in the South Island (Maori Gully).

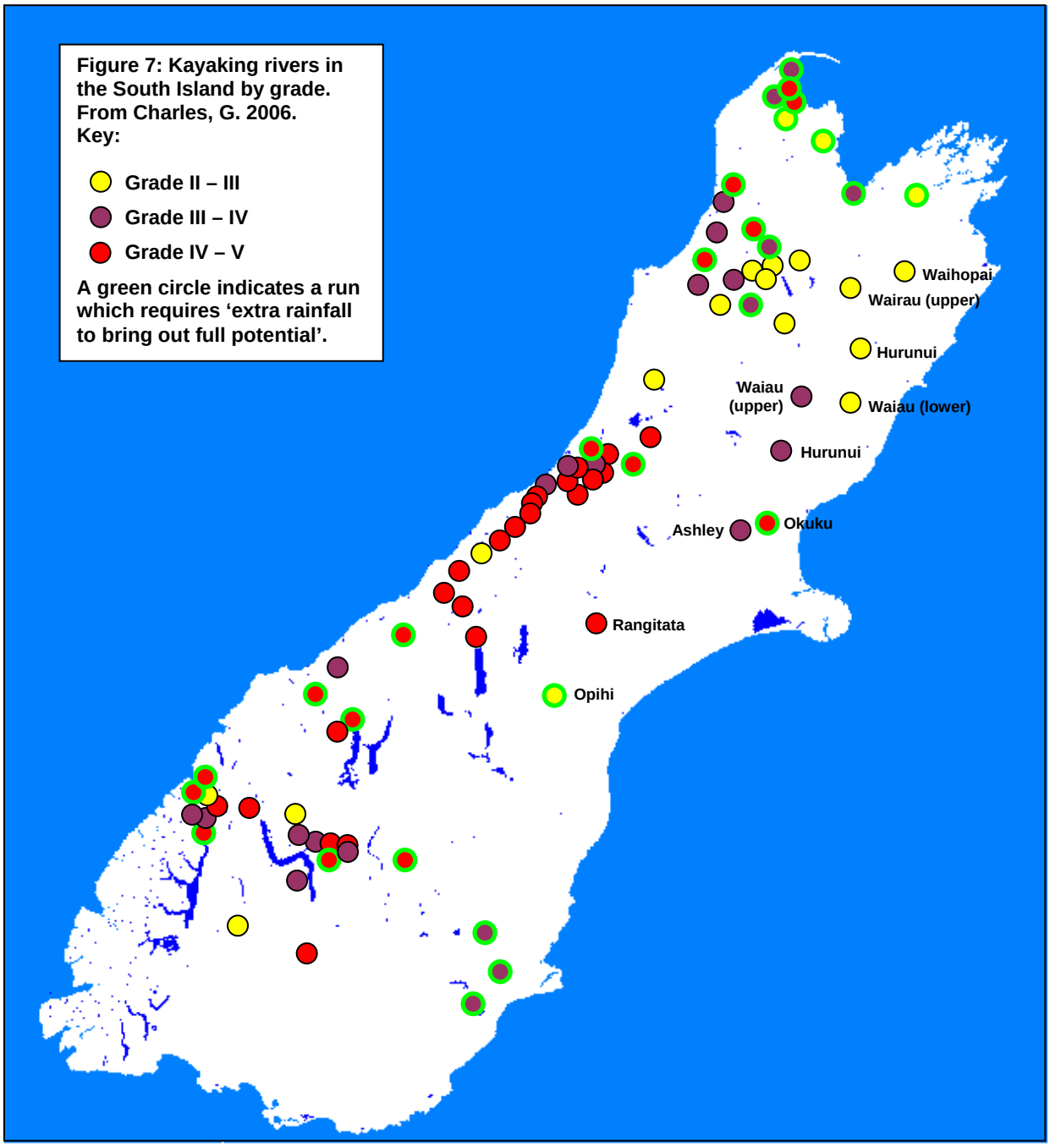
Egarr offers a comprehensive guide to the river, and notes (p122):

> *In the upper Hurunui, the South Branch and the North Branch above Lake Sumner are not often paddled because of difficult access. Some trips have been taken on Lake Sumner in order to run the river down to the Jollie Brook….*
>
> *The South Branch has been largely neglected by paddlers, but it is a very pleasant trip with access via a private road (Eskhead Station).*

Egarr's guide otherwise focuses on Maori Gulley (Seaward River bridge to 1km below the gorge where the road is close), and Hawarden Gorge (below Glenrae River to The Peaks station). Lowry Peaks Gorge is also described, from SH7 to SH1.

Figure 7 shows the South Island kayaking runs recommended by Charles (2006) in his guide book *New Zealand Whitewater, 125 great kayaking runs.* Charles names some 85 South Island runs and

[1] http://www.nz-rafting.co.nz/hurunui.html
[2] http://www.nz-rafting.co.nz/clinics.html



focuses on the more challenging or interesting rivers. The Egarr's 1995 *New Zealand's South Island Rivers,* features 165 rivers, including a very wide range of kayaking options (including the likes of the Avon and Heathcote Rivers in Christchurch City). The Hurunui River is one of approximately 47 Grade 3 to 4 runs recommended by Charles[3], and he writes of it affectionately (p229):

> *Flowing through an isolated sub-alpine valley, much of the attraction of the Hurunui lies in its easy, yet enjoyable rapids with excellent eddies for teaching and learning. It's Canterbury's most used beginner river, the first whitewater trip for countless novices, site of many slaloms and training sessions, and a good hang out to escape the city scene. Take in*

[3] Charles describes the River as Grade 3 to 4 in the main text, but indexes the River as Grade 2 to 3 (p292). I have assumed the main text to be correct.

and appreciate the grandeur of this remote valley while carving and turning your way down the river.

The slalom site at Jollie Brook has some nice surfing waves, and the rest of the trip to Maori Gully is an eddy turning heaven. The entrance to Maori Gully is obvious and there is a river access point on the upstream side of Seaward Stream. The river takes its overall class III/IV grade from Maori Gully.

Maori Gully has been a whitewater enthusiast's haven since the 1970s and has seen descents by all manner of craft, including vehicles from the road high above! There are good play spots in the gorge depending on the flow. People have taken two-three hours to cover this two-kilometre stretch.

Mosley (1982) estimated that a 0.25m metre depth was the minimum required for passage of a kayak or canoe on a braided river.

Interviews completed in 2001 indicated the importance of the river for kayak training. At the time, most tuition was carried out at the Jollie Brook rapid with schools using the Jollie Brook campground. About ten schools ran camps on the site annually - including Christ's College, Boys' High, Mairehau High, St Bede's Kaiapoi, and the Oxford Area School. Maori Gulley was also rafted by schools (two to three rafts at a time).

Kayak tuition was also carried out through the Hawarden Gorge, which includes three rocky drops. There is safe water below this section which means anyone who falls out is not in danger. The get out for this section is across private land on the true right, just below the Mandamus confluence where river opens to a braided river opposite irrigation intake.

Minimum flows for kayaking Maori Gulley are around 15 to 18 cumecs. Maximum for general users is 200 cumecs. Hawarden Gorge is kayakable at the same levels. For novices the river is too high at 70 cumecs (preferred flow for neophytes is 35 to 40 cumecs – however at these flows the river presents no challenge to more advanced paddlers).

It was considered that there are no alternative sites in Canterbury that retain a base flow - only the Rakaia, Rangitata and Waimakariri, but none of these has the same gorges and eddies as the Hurunui. Otherwise, the Buller River (also lake-fed) is the only comparable alternative. The Orari and Opihi are OK when flowing, but they only flow with rainfall (they are not lake fed). The Rangitata gorge is frequently Grade 4 and too difficult for training. The Ashley Gorge is only interesting at between 20 and 50 cumecs minimum – otherwise it is too dry (also too great a distance between get in and get out if anything goes wrong, so not ideal for training). It also lacks the variety of Maori Gulley for training.

The section from Jollie Brook to Seaward River has multiple exit points and is relatively safe for training in the event of an accident. The Jollie Brook section is used for slalom events by Canterbury kayak clubs. There are no other areas with slalom set-ups in Canterbury besides the Groynes, which is flatwater.

Ethelton Gorge is also for training trips. It is a safe section at Grade 2. The get-in is via Cat Hills station (private land) above Ethelton village, and the get-out at State Highway 1. About ten trips per year were run, and it requires same river flows as Maori Gulley (17-18 cumecs minimum).

Other sections of the Hurunui River are generally too tame.

Canard (2009) describes the Hurunui Rivers South Branch as a kayaking resource:

> *As a kayak trip it is not exceptional as a whitewater trip, other than as a part of a suite of kayaking resources in the Hurunui catchment. If public access were readily available, then the South Branch would be used as a novice kayakers' teaching river. It is a pool-drop Grade 2 river*

with easy rapids followed by pools which novices can recover in safely. There are few if any hazards other than sharp rocks in places. The S branch would occupy the niche between simple moving water and one's first rapids. It is perfect for instruction in catching eddies, negotiating small drops, and lacks the 'conveyor belt' faster speed character the main stem has below the confluence.

Gill-Fox (2009) describes the effect of flow variability on the kayaking experience in Maori Gully, with specific reference to Simon's hole – a named rapid in the Gully:

> ***< 30 cumecs*** *- Technical pool-drop character (especially below 20 cumecs) ideal for beginner paddlers pushing into grade 3, as the drops are distinct and can be inspected or portaged and the pools provide plenty of time to recover from any mishaps. Low flows often occur in late summer and the heat of the sun along with a slower journey from its source combine to provide unusually warm water for a South Island river. Again this is ideal for people pushing their grade. Simon's is usually safe to surf in and not too hard to escape with a bit of skill and effort. Other things of note are that in the low 20s there are several waves that simply don't exist at higher flows. Some of these go from being a great surf to impossible to catch with very small flow changes.*
>
> ***30-50 cumecs*** *- Degree of technicality reduces but the river becomes faster and pushier with bigger waves and holes. Some rapids are slightly washed out (flatter) at these flows, others get bigger waves. Simon's becomes increasingly nasty and sticky. Anyone going in it needs to be either very good at playing in large holes and getting out of them, or happy to take a swim after a thumping. In the low 40's there is a wave in Big Bend that does not exist at other flows; OTO has a river wide hole that is split at lower flows and becomes a wave at higher levels.*
>
> ***60-80 cumecs*** *- Some technicality returns as larger hydraulic features that need avoidance appear and the river gains even more push. Some of the most technically challenging flows overall on the Hurunui. At the top of this range Simon's is just starting to form into a big surf wave. At the lower end of this range one's chances of escaping it without swimming are limited. Bum Rock at this range is a very nasty hole too, whereas at lower flows it has a good eddy behind it.*
>
> ***80-100 cumecs*** *- Some big surf waves and big holes appearing. Simon's now becomes a big bouncy surf wave that is great for modern playboats. Magic Roundabout has a mean hole at about 100, but the rest of the rapid is still a huge amount of fun to play in. The surf wave at the bottom of OTO is superb at about 90.*
>
> ***100-200 cumecs*** *- The Gully is then considered Grade 4, with large hydraulic features and lines a kayaker really doesn't want to miss. Any swim from this level up is serious as it tends to be long, and cold. Rapids become increasingly run together with less time for recovery between them. Simon's gradually flattens out and tones down. At around 130 it's great for older longer boats, much higher than that and here isn't much left of it. At about the same flow the wave at The Weir is near its best. The hole at Bum Rock starts to become playable for the bold, but it's big enough to park an SUV in.*
>
> ***>200 cumecs*** *- Becomes more of a 'roller-coaster' run of large wave trains. Simon's? What Simon's? The hole at Bum Rock has now become a massive fast surf wave (actually, 3 waves). My highest flow run (at 240, the day before my wedding) took around 30 minutes and a good chunk of that was surfing this wave and emptying my boat out after it capsized me, imploded my spraydeck and filled up my boat so I had to roll up with it full before paddling to the side. It was great! Other parts of the Gully that are normally relatively benign now become places to avoid – most of the eddies for example are now whirlpools.*

The other Hurunui River gorges react in a similar way to different flows as Maori Gully does. The more open parts of the Hurunui River change less markedly, but in my opinion, still surprisingly more than other rivers with a similar gradient do. This variation provides paddlers with different challenges each time they visit, and different features to develop specific skills on before trying harder rivers in the Buller district or on the West Coast.

4.6 Swimming

Environment Canterbury displays on its website the water quality results for 46 freshwater *"recreational swimming sites around Canterbury"* to advise of water quality for swimming[4]. Data for the Hurunui River is presented for sites at SH7 and SH1 (both 'fair' at the date of this report).

Further data on swimming can be taken from the *Environment Canterbury Inventory of Recreation Values of the Rivers and Lakes in Canterbury* which suggests that both the frequency and intensity of swimming activity are low on the Hurunui River and Lake Sumner.

Interviews carried out in 2001 indicated that the Waitohi and Mandamus Rivers were popular swimming spots, offering safe locations for children; the main flow of the Hurunui generally being too strong, and its tributaries warmer. Swimmers are often locals and campers, especially those from the Balmoral campground. The river by the Balmoral campground is also a popular swimming site (see Section 3.1.12).

4.7 Hunting

Hunting activity is often difficult to quantify from a desktop study or literature review. Interviews with participants and review of hunting permits issued by DOC are required.

The Fish and Game New Zealand) web pages devoted to hunting[5] for the North Canterbury region refer to gamebird hunting in the braided riverbed of the Hurunui River (mallard, paradise shelduck and Canada goose). The website also refers to gamebird hunting in the North Canterbury high country lakes. The game bird season in North Canterbury for 2006/07 is generally 6 May to 30 July inclusive.

The *Environment Canterbury Inventory of Values of the Rivers and Lakes in Canterbury* suggests that the frequency and intensity of hunting for waterfowl to be low throughout the river. Big game hunting is described as moderate in the upper Hurunui, high around Lake Sumner and low at Lake Mason, but with no activity in the lower river.

4.8 Jet Boating

Jet boating is possible from 16km above Lake Sumner to the sea. The Jet Boating New Zealand 'river guide' data for the River describes four sections[6]:

- *SECTION 1: No. 3 Hut to Lake Sumner. Class 3 / shingle / braided / 640m* [altitude at start of section] */ 16km* [length of section]*. Access from Lake Sumner. Requires high flow conditions.*
- *SECTION 2: Lake Sumner. 525m / 10km.*
- *SECTION 3: Lake Sumner to Peaks. Class 3 / rocks / boulders / gorgy / rapids / 525m / 37km. Access from Lake Sumner or at The Peaks Station (variable) - ask permission. Launching: At Peaks.*

[4] http://www.ecan.govt.nz/Our+Environment/Water/SwimmingWaterQuality/Swimming-water-quality.htm
[5] http://www.fishandgame.org.nz/SITE_Default/SITE_your_region/SITE_Nelson_Marlborough/Hunting/default.asp
[6] http://jbnz.co.nz/index.php?option=com_content&task=view&id=42&Itemid=76

- *SECTION 4: Peaks to sea. Class 1 / shingle / braided / 305m / 69km. Access at Peaks, inland road bridge, Highway 1 bridge, or at mouth. Requires high flow conditions.*

The class definitions are:

- Class 1. Easy boating / suitable for beginners / family boating.
- Class 2. More advanced boating/comfortable after one season.
- Class 3. Difficult / adventure / skill required / families not recommended.
- Class 4. Unlikely to be boated / lack of flow / obstructions.

Interviews carried out in 2001 indicated that jet boating use of the River occurs mostly below the bottom of Maori Gulley. The main access points area at SH7, SH1 and the river mouth. The river gets 'quite a bit of use' but use is low when compared to the Waimakariri (which is closer to Christchurch and is probably the most boated river in New Zealand). Much jet boat activity is by local anglers - both salmon and trout. The river receives use from throughout the region, but most use is probably local. Lake Sumner is used, but access (towing a boat) is difficult. Access via the Loch Katrine canal is popular.

Several club runs are held annually (around 30 boats), most frequently using the access at SH7 and running up-river to the bottom of Maori Gulley ('The Chutes') or down river to SH1. Single day events are also held from SH1 and Balmoral up and down river.

Maori Gulley is a difficult section and boats have been lost there.

JBNZ (2009) reports the following preferred flows for each river section:

- Sea to SH1 – “a flow of 25 cumecs is adequate”
- SH1 to SH7 – “a flow of 20 cumecs is adequate”
- SH7 to Mandamus – “a flow of 35 cumecs is adequate …. generally will not be used by recreational boaters below 40 cumecs.”
- Mandamus to Lake Sumner – “This section can only be boated when flows are high, and usually only experienced boaters will utilise this area.”

The Hurunui River is not used for jet boat racing. The upper sections especially are considered too challenging.

A commercial operation which offered jet boat trips on the River had ceased operating by 2001.

It is assumed that the Maritime Rules Part 91 apply to power and jet boating on the lakes, specifically section 91.6:

Speed of Powered Pleasure Craft

(i) No person shall navigate a ship (including a ship towing someone or some object) at a proper speed exceeding 5 knots when:

(a) Within 50 metres of any other ship, floating structure or person in the water; or

(b) Within either 200 metres of the shore or of any structure

4.9 Horse trekking

Interviews carried out in 2001 indicated that the Hurunui catchment was a, ‘superb location with long stretches of open country without gates

The area attracts much informal use, with many groups of riders, including pony clubs – many passing over the Hope Kiwi Saddle on out to the Lewis Pass.

Hurunui Horse Treks is likely to be the largest commercial operation in the area, offering in 2001 two-, four- and eight-day treks in the Lake Sumner Forest Park and the Hurunui River from below Balmoral Forest. The company also offers treks from Hanmer to Kaikoura via Molesworth Station, the Clarence River and Seaward Kaikoura Range, and tailor-made treks. The business is a stand-alone enterprise (it is not associated with a farm).

The company began operating in the mid-1980s and had steady growth, taking between 300 and 400 clients through the Hurunui River area in 2001. The client mix was 60/40 international / domestic (but has varied from as low as 40% international to 80%). There is a good level of repeat business at 30%.

The Hurunui River is the heart of the operation and the operator described its 'semi-wild' state as a major attraction to visitors. Overseas clients 'don't just want to sit on a horse - they want to experience a way of life'.

The operator had examined alternative locations for his business throughout the South Island and decided that no other area could offer the same experience. The river is the main reason the business has survived. The variation in landscape character from valley to valley (South Branch, North Branch, Waitohi) was described as unique. Also the sequence of modification from high to low the nearer to the Main Divide was important. The fact that the river is uncontrolled is also very important.

The company's current website[7] promotes an eight day trek: '*From our base at The Peaks we saddle up and follow the Waitohi River to Mt Whitnow Station, ride over a low pass and journey through the valleys and gorges of the Seaward River and both the South and North branches of the Hurunui River to Lake Taylor Station."*

Alpine Horse Safaris offers treks in the Balmoral Forest area near the Mandamus confluence[8]

4.10 Tramping, walking, picnicking

The Lake Sumner Forest Park, and the Sumner lakes complex are popular visitor venues for casual walks and more dedicated tramps.

Interviews completed in 2001 indicated that Lake Sumner Forest Park is a popular tramping destination. Prior to the advent of the Great Walks marketing exercise carried out by DOC, the Harper Pass route was high on the national list of 'must do' tramps, starting at the Hope River off Lewis Pass and ending at Arthur's Pass. From the Hope Kiwi Lodge both the Three Mile Stream track, and the pack-track around the north-west corner of Lake Sumner are equally used, in order to gain access to the upper Hurunui.

The accessibility to public transport on the Lewis Pass and Arthur's Pass highway, plus the chain of huts, linked with well-marked tracks, was a major reason behind its popularity.

Levels of use are probably lower than ten or twenty years ago. However, the Harpers Pass route would still be on the list of important national tramps for tramping clubs.

The Harpers Pass route is an important accessible crossing of the main divide, at less than 1000 metres above sea level. It was a major Maori crossing, for war parties, and greenstone parties, and an important early gold route in the 1865 West Coast gold rush. The route was also popularised by the Department of Physical Welfare in the 1936-1939, and several huts remain from this period. This was a very early attempt at a 'Great Walk'. Subsequent development work by the New Zealand Forest Service, improved these huts and built the Hope-Kiwi lodge.

[7] http://www.hurunui.co.nz/ride-hurunui.shtml
[8] http://www.alpinehorse.co.nz/halfday.html

The Hope Kiwi trip - from the Hope River off Lewis Pass to the Hope Kiwi Lodge and back - is probably the most frequently taken weekend tramp in the park. It is a large comfortable hut with gas cookers, and there are several good half-day trips to do using the huts as a base. The main access to the Hope-Kiwi lodge is from the Hope River, as the Lake Sumner access involves walking along 4WD tracks for some considerable time. People using this access are more likely to base themselves at the Hurunui Hut. The popularity of 4WD vehicles has now made this road-end more attractive.

Most access for tramping to the forest park is most likely to be made from Lewis Pass. The area lacks loop tracks (most are 'in and out' trips). Other popular tramps in the area include:

- Day and weekend trips up the Hurunui River to the hot springs from Loch Katrine.
- The Jollie Brook as a loop track along the true left of the Hurunui River and up Gabriel Stream. The Jollie River track is prone to flooding.
- Tramping in the head of the Hope River, giving access to more hot springs and Amuri Pass.

Four wheel drives have changed the dynamics of the area substantially, and most such areas in NZ, with older trampers driving further into the park to access walking tracks. Fishermen and hunters also predominately use 4WD for access

In 2001 the DOC VAM (visitor asset management) database recorded the following estimates for visits to the area:

- Hope-Kiwi Lodge - 4000 person nights
- Hope-Kiwi to Hurunui Huts via Three Mile Hut - 400 visits (50% stay in hut)
- Hope Kiwi to Hurunui Huts - 3000 visits
- Harpers Pass - 1000 visits

In comparison the St James walkway had 4000 visits. All these figures were 'best guesses' developed by DOC staff at the time.

Walking and picnicking are associated with all recreation opportunities in the setting, where access is possible. Marked tracks include the Jollie Brook, Gabrielle Stream and Three Mile Stream.

4.11 Four wheel drive, mountain biking

The accesses to Lake Sumner are recognised recreational 4WD routes. Sibly and Wilson (1996) describe the main route from Lake Taylor to the upper Hurunui River (Figure 8). The authors note (p102):

> *Spectacular shingle screes can be distracting on the drive up the Hurunui River gorge, as can the antics of canoeists in the swirling waters below, but watch out for other traffic - the road can be busy.*
>
> *At Lake Taylor the sign on the track says it all: 4WD only from here on. Muddy water-holes abound but most have solid bottoms and should present few problems. After driving through flat tussock land sprinkled with matagouri, and with mountains towering up to right and left, you get to Loch Katrine with its bach settlements, boat ramp and popular camping areas.*
>
> *You can drive on up the western side of the lake to Home Bay, at the head of Lake Sumner, another popular camping area. The track continues to the old No. 2 Hut reserve. The hut itself was burnt down in 1996.*

A swingbridge across the Hurunui River marks the end of the road for driving, but a one-and-a-half- hour walk through manuka and beech forest along the side of the river will bring you to a hot spring. A pool has been shaped for the spring to flow into and it will fit six people. From the heat of the pool, you can dive into the icy Hurunui to cool off.'

A word on the weather: Lake Sumner is at its best when there is an easterly on the Canterbury coast. A nor'wester brings biting winds and driving rain, whatever the season.

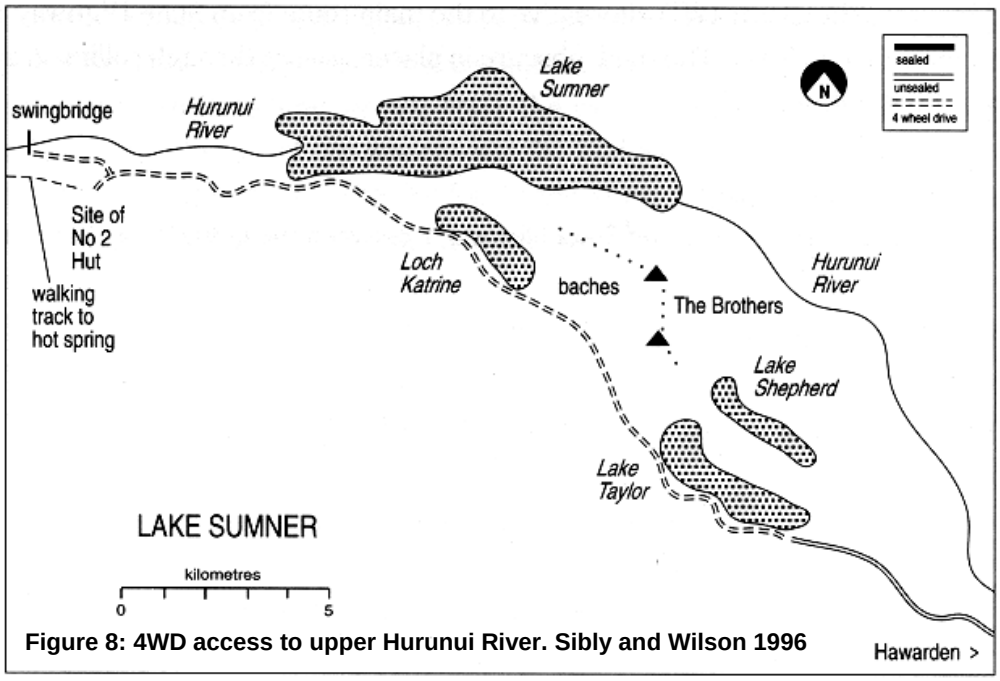


Figure 8: 4WD access to upper Hurunui River. Sibly and Wilson 1996

Kennet at al (2002) recommend the same route for mountain biking.

4.12 Camping

The Department of Conservation administers two camping sites within the Lake Sumner Conservation Park: at Loch Katrine and Lake Taylor – the latter is of a slightly higher standard than the former, with easier access.

The Balmoral Reserve is located at SH7 and another campsite is located at the River mouth. The Balmoral site is managed via a local management committee. Interviews in 2001 indicated that it is a consistently popular site, with third generation campers often in residence. The NZ Forest Service originally established the site as a campground after some encouragement by locals. The camp is considered to take pressure off more ecologically sensitive and vulnerable areas. The river is the focus of the campground and usually offers a relatively safe swimming environment with swimmers using natural side pools separated from the main current - the river here is braided and considered not as powerful a flow as it is below a major irrigation intake.

In 2001 the Domett Reserve Committee administered the Hurunui River Mouth Campground and employed a caretaker during busy periods. The camp ground was considered 'remote' and to 'meet the need'. There are no plans to modify or expand the site to any great extent. It is very rare that the site is overcrowded, with a maximum capacity of 24.

The 2000 and 2001 years were quiet (low numbers of campers), considering the income from the site. Use is related to the success of the salmon fishing season. There is also some use related to

whitebaiting during that season. Erosion has been a problem, with a picnic area having been lost in the past two years. Some erosion control work is being carried out with willows.

Informal camping occurs along the banks of the Hurunui River where the Lake Sumner Road parallels the water. This is often association with kayaking. The Jollie Brook site is popular, and is well-used by school groups.

5 Significance assessment – supporting data

The data presented in this section are generally from research and policy publications which define the uses and significance of the recreation settings in the study area.

5.1 National Inventory of Wild and Scenic Rivers

In 1982 the National Water and Soil Conservation Authority released a draft inventory of wild and scenic rivers and sought submissions. A resulting document was published in 1984 (Grindel 1984), which provides a list of what were considered to be "nationally important wild and scenic rivers." The final list excluded lakes because the Committee responsible for compiling the list decided that its terms of reference did not include them. Approximately 40 rivers were identified in the South Island, including the Hurunui River from its source to its confluence with the Mandamus River for its 'biological / scientific / cultural' values. Its 'outstanding characteristic' was southern crested grebe habitat. The report made some additional comments (p22):

> *Harmonious natural forest covered catchment which is remote and inaccessible providing valued scenic and recreational amenity. Waterfowl feeding and breeding. Shooting, camping, tramping, fishing.*

The Ministry of Agriculture and Fisheries made a substantial submission to the draft inventory in relation to freshwater angling values (Tierney *et al* 1982). The authors recommended that Hurunui River be considered as nationally important as it was, 'by far the most highly regarded trout fishery in the region', and that Lake Sumner was 'an integral part of the system'. The text describing the Hurunui is:

> *The Hurunui River, in the North Canterbury acclimatisation district, was by far the most highly regarded trout fishery in the region. The river also supports a salmon fishery, mostly in the lower reaches, but this is considered to be of regional or local importance. The trout fishery attracts anglers to all parts of the river (Davis 1982), although the upper reaches (particularly the section below Lake Sumner) are the most heavily fished. FRD's [Fishery Research Division] national survey findings confirmed this, and clearly indicated that the upper reaches of the Hurunui support a trout fishery of exceptional quality.*
>
> *The section of river under consideration takes in all of the river above the Mandamus confluence, excluding the South Branch. Scenic beauty and solitude were considered outstanding in this reach, both attributes being rated as exceptional by 80% of the respondents. The catch rate was considered to be good, and fish in excess of 65 cm were taken by anglers, although most fish were in the range 40-55 cm. The upper Hurunui was popular with dry fly anglers, who comprised two thirds of the respondents, although spinners and nymphs were also favoured by some anglers. An unusually high proportion of the anglers (60%) noted camping as an associated activity, with tramping, shooting, canoeing, and picnicking each being listed by 25-30% of the survey respondents.*
>
> *The above characteristics indicate that the upper Hurunui has all the attributes of a nationally important scenic river fishery. Its usage is high for such a river - the survey data indicate that the Hurunui received approximately 8,500 visits annually from trout anglers, and that 60% of these anglers fished in the upper reaches. Road access is possible to some of the river below Lake Sumner, but most of the river can be reached only by four-wheel drive vehicle or by foot. That anglers are prepared to overcome these access problems is a further demonstration of the attraction of the fishery. Much of the upper*

Hurunui lies within the Lake Sumner Forest Park, and the fishery is an important asset to the area.

In terms of the upper Hurunui fishery, Lake Sumner must be regarded as an integral part of the system. Trout are known to move between the lake and the upper part of the catchment, and there is no reason to suppose that they do not travel freely throughout the system; anadromous salmon, for example, spawn in the headwater tributaries above the lake. Like Lakes Rotoroa and Rotoiti, Lake Sumner may well prove to be of national importance for angling, given suitable criteria and sufficient comparative data.

Notably, the *Proposed Canterbury NRRP* refers to this study, amongst others, in supporting Policy WQN1 Natural State Waterbodies (which includes the Hurunui River from source to Lake Sumner, and the tributaries of the Hurunui above the Mandamus confluence) (p5-41).

5.2 A list of rivers and lakes deserving inclusion in a Schedule of Protected Waters

In 1986 the Protected Waters Assessment Committee released its recommendations for a, "*list of those lakes and rivers which the committee commends as suitable for inclusion in a Schedule of Protected Waters*" (Grindel and Guest 1986). The intention of the study was to advise the then Ministers of Works and Development and Conservation of, "*those waters deserving inclusion in a schedule of Protected Waters that can be attached to the Water and Soil Conservation Bill.*"

The committee's analysis built on the *National Inventory of Wild and Scenic Rivers* (Grindel 1984), but expanded the scope of assessment from that study's limit of wild, scenic, recreational and scientific values to include, in addition: fisheries, wildlife habitat, flora, tourism and cultural values.

In terms of recreational values, the relevant assessment procedure for identifying an outstanding waterbody was well outlined (p7). This process was drawn, in the main, from the approach used in the *National Inventory of Wild and Scenic Rivers*:

"This category includes those rivers where the existing water regime plays an essential and dominant role in providing an outstanding recreational experience or range of experiences. An area which has an unrealised potential for providing an outstanding amenity may be considered. While the surrounding landscape may contribute significantly to those experiences the water, the river or lake bed and possibly a narrow riparian strip are the crucial elements for the recreational value. The recreations are mainly instream use (angling, jetboating, canoeing, packfloating, etc) but this committee recognised that picnickers, etc, also went there because of the water, not in spite of the water. An area may be considered outstanding because of one or more of a number of characteristics. It may provide a wide variety of recreational experiences and be used often by people within and, to an extent, outside its region. Or its present level of use may be low but provide an exceptional type of recreational experience, possibly requiring advanced skills so that people from other regions or overseas travel to the area to use it.

"Summary of characteristics

a The characteristics vary and largely reflect the recreational uses for which the river is outstanding.

b The river satisfies the recreational needs of a large number of people, or constitutes an amenity for a wide variety of recreational activities, or provides an outstanding recreational experience.

c A river in this category may be under-utilised at present but have potential for varied, intensive or specialised use.

d *The area may be readily accessible, frequently by road. The surrounding land may show signs of human activity and settlement.*

e *The water may be subject to some minor diversions and there may be some development such as bank protection works, but not to the extent that the river regime is controlled.*

f *While there may be some waste discharges, the water will usually be of a quality compatible with the recreation activities.*

"Rivers are the focus of a great variety of recreational activities. A range of recreational facilities for present and future recreationists must be protected throughout the country.

a *Wilderness and expedition type facilities : generally wild and scenic rivers of sufficient size to permit a range of recreational values.*

b *White water : essential for whitewater rafting, canoeing, jetboating.*

c *Placid water : essential for boating activities where coastal waters unsuited to boating.*

d *Small urban streams : close to populated areas for general recreation and picnicking.*

e *Routes as access and as a form of recreation."*

The committee developed a three tier classification (groups one, two and three) to define an order of importance for the waters identified as outstanding. In terms of including the waters in a schedule of protection (p12), "*anything less than the first group would provide an inadequate representation. If the Schedule should be bigger, then the second group should be used for making a selection. If the two together are insufficient then the third group should be used for making a selection*."

The Hurunui River (including Lake Sumner) from its source to the Mandamus confluence was listed as a group one river (highest priority), with the narrative:

This is outstanding for its wilderness, scenic, recreational, fishery, wildlife and cultural values.

It includes a large lake (Sumner) and is an essential feature of the forest park. There is a regularly used tramping route to the West Coast. It is a nationally important southern crested grebe habitat and supports waterfowl feeding and breeding. Recreation includes salmon and trout fishing, shooting, tramping, camping, canoeing, rafting and jetboating.

The route over Harper's Pass was used by the Maori people as a trading and expedition route in regard to greenstone (see Arahura River for notes on the cultural value of greenstone).

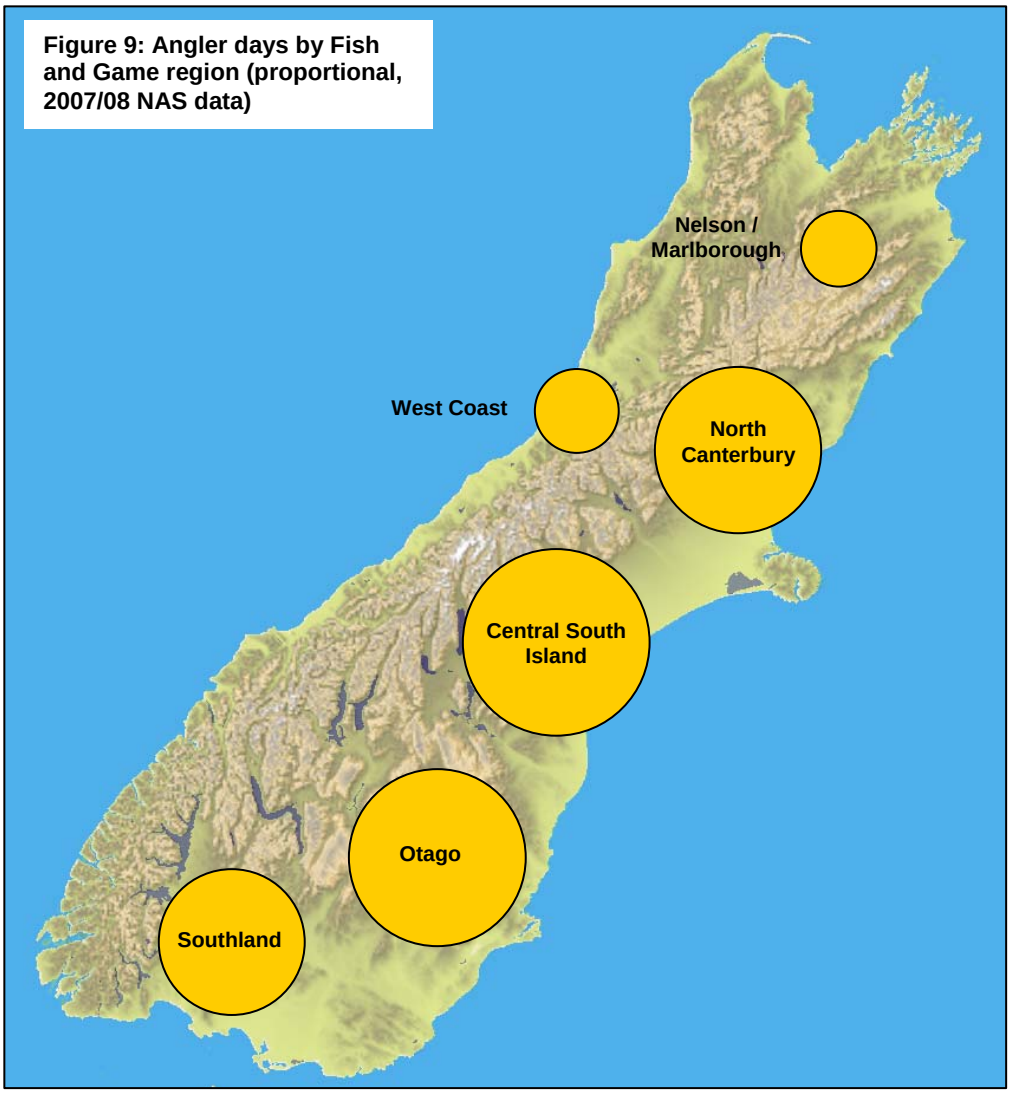
The River's tributaries were not discussed.

5.3 The 2007/08, 2000/01 and 1994/96 national angler surveys

The national angler surveys (NAS) completed for Fish and Game New Zealand by NIWA are useful for comparing the level of recreational use of the various waterbodies in the study area (Unwin 2009, Unwin and Image 2003, Unwin and Brown 1998).

The NAS results are based on a national telephone survey of a sample of licensed anglers, relying on their recall over a two month period. Regional Fish and Game staff managed the respondent interviewing process at the regional level.

Figure 9: Angler days by Fish and Game region (proportional, 2007/08 NAS data)



The survey process was complex and required a number of assumptions to be used in sampling and analysis, all of which are necessary and inevitable in studies of this complexity. However, without calibration it is impossible to check whether the assumptions and survey technique are in fact offering accurate data. As calibration has not been completed (Martin Unwin, NIWA, pers comm.), the NAS studies should be used only in a relative sense (comparing levels of use, rather than defining actual levels of use at specific sites) as any error is most likely to have been applied evenly across all data sets. This means that while the figure of 12,600 (±1440) angler days on the Hurunui River for the 2007/08 period covered by the national angler survey might be unreliable, it is possible to more confidently state that the Hurunui is slightly more popular that the Wairau River, for example (Figure 10).

Figure 11 shows the 2001/02 reported pattern of use of the Hurunui catchment. The 2001/02 NAS sought to identify the level of use of the main stem of the Hurunui River above and below the Mandamus confluence: approximately 40% of activity was above Mandamus and 60% below (assuming those respondents who did not specify a reach fished in the same manner as those who did).

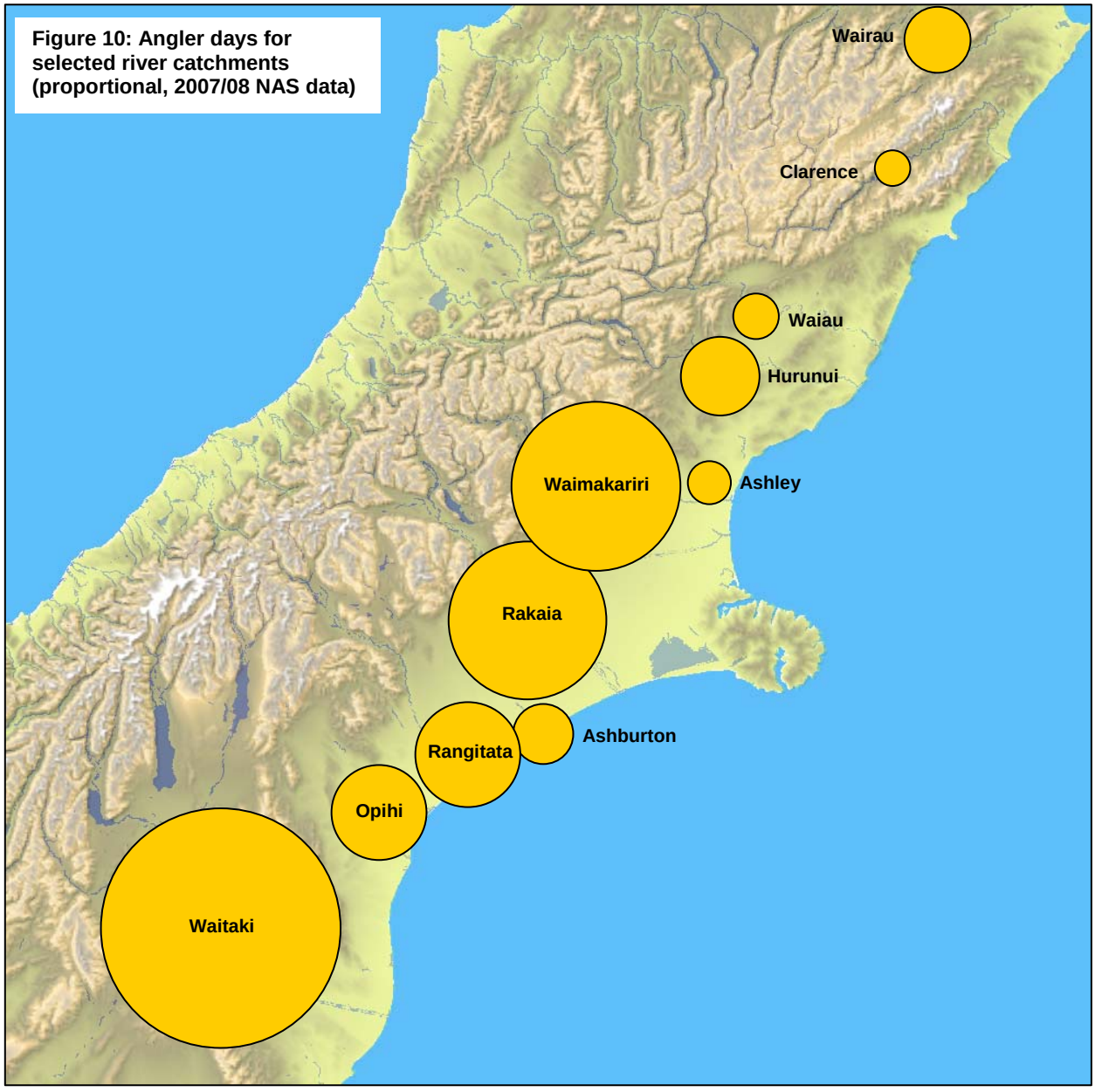


Figure 10: Angler days for selected river catchments (proportional, 2007/08 NAS data)
Wairau
Clarence
Waiau
Hurunui
Waimakariri
Ashley
Rakaia
Ashburton
Rangitata
Opihi
Waitaki

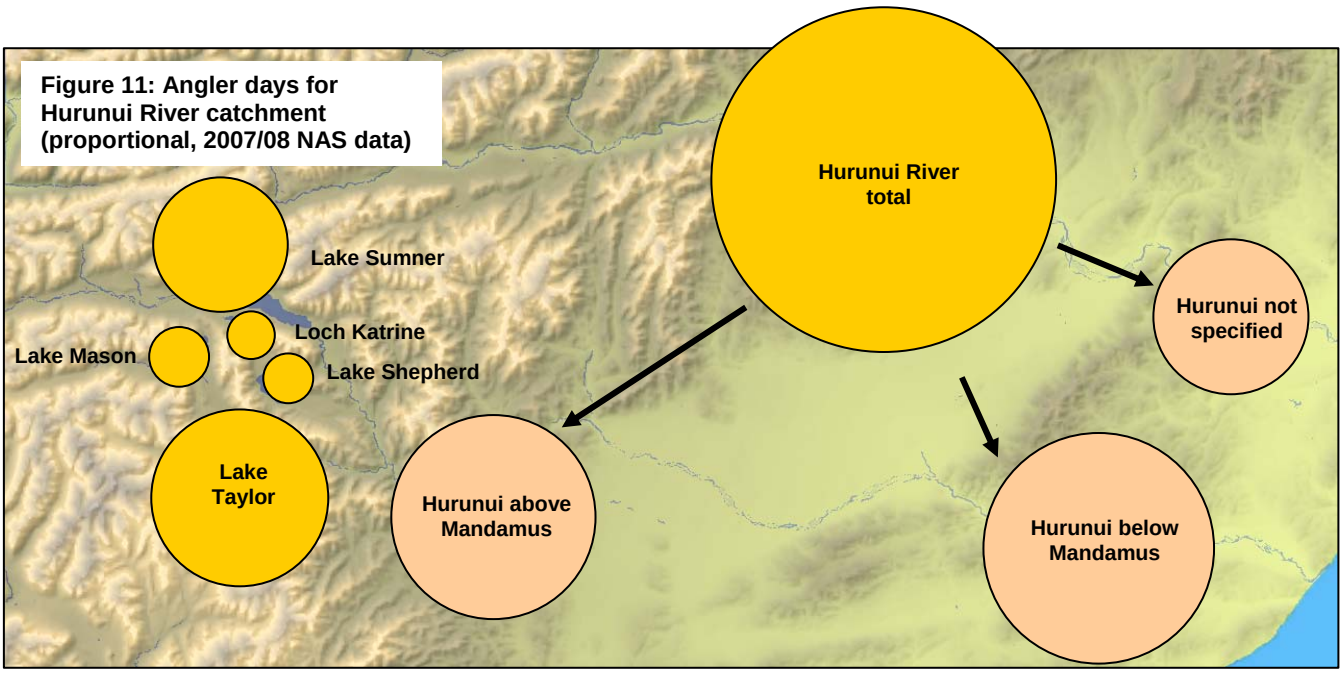


Figure 11: Angler days for Hurunui River catchment (proportional, 2007/08 NAS data)
Hurunui River total
Lake Sumner
Loch Katrine
Lake Mason
Lake Shepherd
Lake Taylor
Hurunui above Mandamus
Hurunui not specified
Hurunui below Mandamus

The Hurunui River experienced a significant decrease in angler use between the 1994/96 and the 2001/02 studies – approximately a 50% reduction in activity over a five or six year period. Angler activity on the lakes was generally stable. Angler activity grew in the 2007/08 season, but did not reach the peak of the 1994/96 season (Tables 2, 3 and 4).

Table 2: Angler days by two-month period, 2007/08							
Season	**Oct-Nov**	**Dec-Jan**	**Feb-Mar**	**Apr-May**	**Jun-Jul**	**Aug-Sep**	**Season total**
Hurunui River	2060 ± 500	4940 ± 1060	4030 ± 700	1070 ± 400	90 ± 70	410 ± 240	12600 ± 1440
Loch Katrine		160 ± 100	100 ± 100				260 ± 140
Lake Mason	80 ± 60	40 ± 40	140 ± 90	120 ± 90			280 ± 150
Lake Sheppard	30 ± 30		210 ± 100				240 ± 100
Sumner Lake	240± 170	760 ± 360	420 ± 180	130 ±120	290 ±240	60 ± 60	1910 ± 520
Lake Taylor	330 ± 200	1110 ± 870	1070 ± 430	810 ± 810			3320 ± 1280

Table 3: Angler days by two-month period, 2001/02							
Season	**Oct-Nov**	**Dec-Jan**	**Feb-Mar**	**Apr-May**	**Jun-Jul**	**Aug-Sep**	**Season total**
Hurunui River	880 ± 210	2820 ± 440	3220 ± 800	1170 ± 310	280 ± 130		8380 ± 990
Loch Katrine	80 ± 50	20 ± 20	70 ± 30	30 ± 30			200 ± 70
Lake Mason			20 ± 20				20 ± 20
Lake Sheppard	30 ± 30	50 ± 30	50 ± 30				120 ± 50
Sumner Lake	30 ± 30	330 ± 170	70 ± 50			100 ± 100	520 ± 210
Lake Taylor	200 ± 100	120 ± 60	280 ± 70	130 ± 80		240 ± 140	520 ± 210

Table 4: Angler days by two-month period, 1994/96							
Season	**Oct-Nov**	**Dec-Jan**	**Feb-Mar**	**Apr-May**	**Jun-Jul**	**Aug-Sep**	**Season total**
Hurunui River	1328 ± 403	6299 ± 2049	7450 ± 2339	924 ± 537	1103 ± 975		17,105 ± 3327
Loch Katrine	89 ± 87		104 ± 101				192 ± 134
Lake Mason			300 ± 296				300 ± 296
Lake Sheppard	59 ± 58	65 ± 64	109 ± 76				233 ± 115
Sumner Lake	237 ± 135	151 ± 95					387 ± 165
Lake Taylor	385 ± 198	165 ± 97	198 ± 122				748 ± 252

5.4 Relative value of Canterbury rivers to New Zealand anglers

In the 1980s a series of New Zealand Freshwater Fisheries Reports were issued with the aim of identifying and assessing the local and regionally significant angling rivers of each region. These studies complemented the *Submission on the draft inventory of wild and scenic rivers of national importance* (Tierney *et al* 1982) discussed in Section 5.3, which was intended to identify rivers of national significance.

The Fisheries Environmental Report No. 89 (Tierney *et al* 1987) reported on findings of a postal survey in reference to North Canterbury rivers which was responded to by 869 anglers from the

North Canterbury Acclimatisation Society district (from a target population of 1557 which was randomly selected from 11,325 holders of whole season adult licence holders). Of that 869, 111 respondents had fished the Hurunui River for trout and 104 had fished for salmon. The average annual number of trips reported for trout anglers was 5.3 and for salmon 5.7. An estimate of 1600 trout anglers and 1500 salmon anglers was generated for all use of the Hurunui River, with an estimate of 8500 annual trout angler visits, and 8700 salmon angler visits. It appears that this is likely to be an over-estimate as it assumes non-respondents to the survey had very similar patterns of behaviour to respondents[9]. It could well be argued that non-respondents to an angling survey (or any postal recreation survey) are likely to be less serious anglers and therefore less frequent visitors to rivers. Indeed, the 1987 estimate for angler use is more than double that reported by Unwin and Image (2003) for the 2001/02 season.

Trout anglers assessed the Hurunui River as being very remote (1 on a 5 point scale), having average access (3 on the scale), above average fishable area (4 on the scale), high scenic beauty (5 on the scale), high solitude, an average catch rate (3) and average size of fish. Overall, the river was rated as of 'very high' importance for trout (5 on a 5 point scale). The only other river in North Canterbury to gain a score of 5 was the South Branch of the Waimakariri River.

The Hurunui River was divided into three sections for trout angling activity. Between 41 and 60% of respondents fished the headwaters, between 61 and 80% fished the middle reaches and between 21 and 40% fished the lower reaches.

Salmon anglers assessed the Hurunui River as being moderately remote (2 on a 5 point scale), having average access (3 on the scale), average fishable area (3 on the scale), above average scenic beauty (4 on the scale), above average solitude (4), a low catch rate (1) and very large size of fish (5). Overall, the river was rated as of 'high' importance for salmon (4 on a 5 point scale). The other salmon rivers identified in North Canterbury, and their importance grades, were the Waiau (4), Ashley (2), Waimakariri (5), Rakaia (5), Harper (3) and Ryton (4).

The Hurunui River was divided into three sections for salmon angling activity. Between 21 and 40% of respondents fished the headwaters, between 41 and 60% fished the middle reaches and between 61 and 80% fished the lower reaches.

Twenty-nine percent of respondents on the Hurunui River fished for salmon only, 34% fished for trout only, and 37% fished for both.

Other recreational activities associated with fishing on the river were: enjoying the scenery, picnicking (salmon anglers more-so than trout), swimming and camping.

The report found (pp36-39):

> *From its source on the main divide, the Hurunui flows 150 km in a generally easterly direction, passing through a variety of landscapes before reaching the coast. The beech forests of the headwaters give way in succession to hills covered in tussock and scrub, cultivated plains, an extensive pine plantation, tussock-clad coastal hills, and a narrow coastal plain. This variety in the catchment is reflected by a diversity of river form which is characteristic of the Hurunui. Steep, rocky headwaters are transformed into a gentle flow over gravel towards Lake Sumner,' below which the river is confined by several short, rocky gorges before it meets the South Branch. The combined flow passes through Maori Gully,, a low rock gorge, and Hawarden Gorge, with high rock walls and chutes. before emerging onto the Culverden Plains, where it becomes braided. The lower river is then confined once*

[9] The 1987 report notes that it assumes non-respondents had the same average characteristics as the respondents and notes (p90): *We would emphasise that the main point of the NAS was to evaluate the relative* [their underline] *usage of the rivers in each district, and that any inherent bias in the usage estimates is unlikely to favour one particular river."*

more to a single channel, and it flows quietly through the Lowry Peaks Range before emerging onto a wide, braided, shingle bed and thence to the sea.

The Hurunui is the fourth largest river in the district, with a mean annual flow of 51 m31s at Mandamus. It is also the fourth most fished river, after the Waimakariri,, Rakaia, and Selwyn Rivers. An estimated average of 2300 adult anglers made 17 000 fishing trips to the river each year, for 3-5 fishing seasons before 1980. Since then. the results from a separate FFC postal survey of Hurunui anglers, conducted between the 1979 and 1981 seasons, Corroborated our estimates by giving figures of 2250 adult anglers and 15 600 visits (Bonnett 1983).

The Hurunui was considered to be one of the best trout rivers in the district, with more than 60% of respondents assigning it 1 of the 2 highest importance ratings. Brown and rainbow trout were the target on about half of the fishing visits, and sea-run quinnat salmon fishing accounted for the rest, despite being valued less highly than trout fishing. Of the respondents, 63% sought either trout or salmon exclusively, and the rest sought both. Trout and salmon fishing on the Hurunui attracted anglers from every other South Island district, and from several North Island districts as well.

The most popular reaches for trout fishing were the upper and middle, each of which attracted about 60% of the respondents. In contrast, most of the salmon fishing took place in the lower and middle reaches, where almost 70% and 50% of respondents respectively concentrated their efforts. Differences between trout and salmon fishing experiences were largely attributable to the preference for different parts of the river by either type of angler. Trout anglers had to travel further to reach the remote upper river, which was less accessible than the lower river preferred by salmon anglers. However, the expanse of fishable water amid impressive high country scenery more than compensated for the effort involved. The upper reaches, which flow through Lake Sumner Forest Park and through short attractive, gorges downstream from the lake, were considered to have exceptional scenery by more than 80% of the respondents who restricted their fishing to these reaches. They also reported a very high catch rate of above average- sized trout.

These results-agree well with those of Bonnett (1983), who recorded the highest percentage of the total catch coming from this section of the river. A higher catch rate and total catch than anywhere else in the river suggests that trout were also more abundant in the upper river. The relative number of trout, determined by drift diving a 4.7-km reach immediately downstream from Lake Sumner, was consistently higher than counts from 2 sections further downstream (Bonnett and Docherty 1985). When compared to other New Zealand rivers, the large number of trout in the upper reaches has qualified the Hurunui for inclusion in the high trout abundance category (Jowett and Hicks 1985). Certainly, all of these observations support anglers' evaluation of the catch rate, which was higher in the upper reaches than further downstream. Anglers who enjoyed wilderness headwater fishing preferred dry flies to nymphs and wet flies. Spinners were the most popular lures with trout anglers, and were used almost exclusively by salmon anglers, who reported a low catch rate of very large fish. This is typical for sea-run salmon.

Respondents rarely confined their recreational activities on the Hurunui to fishing. This river was extraordinarily popular with anglers for a range of activities. More than 40% of the salmon respondents enjoyed the scenery, camped, or picnicked, and more than 20% combined fishing with swimming. Almost 60% of the trout respondents specifically mentioned enjoying the scenery, and, in contrast to salmon anglers, preferred camping to picnicking, particularly in the headwaters. Hunting and tramping were more often combined with trout angling than with salmon angling, but swimming was equally popular with both

groups. Painting and sketching were recorded by 1 respondent, and 4 mentioned jet boating. Most comments extolled the virtues of the Hurunui, but the effect of water abstraction for irrigation was a matter for concern:

- best potential for recreation in North Canterbury

- a superb fishing river

- superb angling when conditions O.K.

- most potential

- great place to spend a day

- good clean river to fish

- like the upper reaches

- good fun but difficult

- good place to escape noise

- this system is considered by our family to be the best available in Canterbury and should not be disturbed in any way. Also backed up by State Forests adding value for all the family and friends

- a river worth preserving - irrigation a problem

- ban the MWD

- catch rate was high 1950-77, now reduced, 78-79.

Current water rights allow for 5 m^3/s to be abstracted for the recently completed Balmoral irrigation scheme. Although other irrigation schemes have been proposed, they could collectively require more water than is available an a run-of-the-river basis, and will probably not proceed in the foreseeable future (Davis 1984).

The hydro potential of the river has been the subject of a number of investigations and reports since the mid 1970s. Royds, Sutherland, Mcleay Ltd. (1981a) described 10 possible schemes, including 5 between the Lake Sumner outlet and the confluence of the mainstem with the South Branch, 3 associated with the Balmoral irrigation scheme, and 2 in the section of the river which flows through the coastal Lowry Peaks Range. The North Canterbury Electric Power Board has focused its attention on the upper scheme proposals, and 2 of these have been investigated in more detail (Downer and Co. Ltd. 1978, Tonkin and Taylor Ltd. 1982).

Fisheries studies were initiated in response to the earliest investigations, to gauge the potentially harmful effects on very important existing fishery values. The results of these studies not only dealt with the impact of local authority hydro development (Docherty, Lane, and Johnson 1978), but were also used in submissions on the Hurunui Water Allocation Plan (Docherty 1979) and on the Balmoral irrigation scheme (Davis 1980). MWD is currently investigating the feasibility of diverting Hurunui water from Mandamus through to the Waiau, around Mouse Point, where it will augment flows from the Clarence and Waiau for power generation within the Waiau catchment.

FFC has been concerned about the Hurunui River because it is one of the country's most highly regarded river fisheries. Above its confluence with the South Branch, the scenic and wilderness trout fishery is worth protecting in its present state. Further downstream, both trout and salmon fisheries are valued. The lower reaches and river mouth support a great deal of fishing pressure from salmon anglers, who consider this to be the third most

important salmon river in the district. Therefore, we are very concerned about the number of proposals for development of the river, and consider that detailed fisheries investigations should be a prerequisite for planning.

In its discussion, the authors noted (p66):

"The Waimakariri, the upper Hurunui, and the Clarence have all been included in 'Group I' of the Proposed Schedule of Protected Waters (Grindel and Guest 1986)."

And opined (p64):

By comparison, the Hurunui, the third most important salmon river in the district, could rival neither [the Waimakariri nor Rakaia Rivers]*, yet it was the most highly valued trout river in the district. The Hurunui supports a trout fishery of exceptional quality upstream from Mandamus. Anglers greatly appreciated the solitude and the outstanding scenery of the upper catchment. Although it is remote and inaccessible, the Hurunui supported a high catch rate of fairly large trout for those anglers willing to make the effort to reach the river. The upper Hurunui qualifies on all counts as a scenic river fishery of national importance, worthy of being protected in its existing state, and it is also noteworthy for hosting a wide range of other recreational activities. like the Waimakariri and Rakaia trout fisheries, the Hurunui salmon fishery is regionally significant.*

5.5 Angler Surveys of the Hurunui River 1979/80 – 1981/82

Bonnett et al (1991) summarised the findings of three surveys of Hurunui River anglers carried out over three seasons between 1979 and 1982. Postal questionnaires were sent to 3825 license holders within the North Canterbury Fish and Game region, with an average of a 90% response rate over the three periods, which is exceptional (three contacts were made with each potential respondent, including a final phone call).

An estimate of angler effort, in angler days, and total number of anglers was made for each season:

- 1979/80: 19,700 ± 6392 angler days, 2665 ± 335 angler
- 1980/81: 15,900 ± 3980 angler days, 2646 ± 317 anglers
- 1981/82: 23,657 ± 7026 angler days, 3094 ± 357 anglers

The river was divided into seven activity zones and a summary of the distribution and effort of anglers provided (p14):

***Zone A (river mouth)** attracted by far the most angling effort, was the most popular area for salmon fishing, and accounted for the greatest proportion of the salmon catch. It also was moderately popular for trout fishing, and contributed a modest proportion of the trout catch. The popularity of the river mouth area for salmon fishing is typical of Canterbury salmon rivers, most of which provide good access for fishing. This area also caters for a range of other recreational activities (such as whitebaiting), and there is a small "holiday home" community;*

***Zone B (mouth to SH1)** was popular for salmon and trout angling, but received only a moderate proportion of the total effort; apparently many anglers fished there, but few did so often, which may account for the modest proportion of the salmon and the low proportion of trout caught there;*

***Zone C (SH1 to Mandamus)** was popular for salmon and trout angling, and attracted more effort than any other zone, with the exception of Zone A. The proportion of the salmon catch taken there was high, but the proportion of the trout catch was only average. Its*

popularity may be a reflection of its size (it was by far the largest zone in the survey) and its relatively good access;

***Zone D (Mandamus to the confluence of the North and South Branches**) was only moderately popular for salmon and trout angling. It received relatively little effort (possibly because access to much of the zone is difficult), but accounted for reasonable proportions of the salmon and trout catch;*

***Zone E (the South Branch, including Lake Mason)** was the least popular zone for either salmon or trout fishing, and attracted the lowest proportion of the angling effort. It contributed the lowest proportion of the salmon catch (during the 1981182 fishing season, no salmon were caught in Zone E by the anglers surveyed), and almost the lowest proportion of the trout catch. (Note that access to much of Zone E is more difficult than to any of the other zones, and that this branch of the river is relatively unstable, being more prone to flooding and water discolouration);*

***Zone F (the North Branch from the confluence to, but not including, Lake Sumner)** was popular for trout angling, but not for salmon angling. It received a moderate proportion of the total effort, and produced the second highest proportion of the trout catch. This area is most likely to appeal to dedicated anglers, because access to much of the zone is difficult. However, the area is highly regarded by trout anglers, because it supports a high quality lake-outlet fishery. Its unpopularity for salmon fishing is reflected in the low catch of salmon;*

***Zone G (North Branch above, and including, Lake Sumner and Loch Katrine)** was similar to Zone F; it was popular only for trout angling, and attracted a moderate proportion of the total effort. Access to this area also is quite difficult. It contributed the highest proportion of the total trout catch (note that this zone included 1,ake Sumner), but a low proportion of the total salmon catch.*

The authors did not attempt an assessment of the significance of the River, but noted that Teirney et al (1987) had described it as 'one of the country's most highly regarded river fisheries', and that it was one of the few rivers in the region where anglers could seek both trout and salmon.

5.6 Sustainable Water Programme of Action (MfE)

The Ministry for the Environment (MfE) is continuing a national review of the sustainable management of waterbodies to advise government policy within its Sustainable Water Programme of Action programme. Three studies commissioned by MfE are relevant to this exercise.

5.6.1 Waterbodies of national importance for recreation (MfE)

The Hurunui River is listed by the Ministry for the Environment (MfE) within the report, *Potential Water Bodies of National Importance for Recreation Value* (MfE 2004a). The MfE study appears to be based on a weak methodology, and its findings would be open to challenge – although the report is designed to be a catalyst for discussion rather than to provide a conclusive analysis. It should be noted when reviewing the report that the Hurunui River has been entered twice by error in its main significance summary table (pages 18 and 19).

Six criteria were used to identify potentially national significant waterbodies:

- *That the NAS results for the 2001/02 and/or 1994/96 showed at least 10,000 angler days for the waterbody or the catchment.* The Hurunui River featured 8380 in 2001/02 and 17,100 in 1994/96, and was listed for the catchment having passed the 10,000 angler day threshold in 2001/02 and the River in 1994/96. More discussion about catchment-based assessments is given below (they are illogical).

- *Of a national telephone survey (Fink-Jensen et al 2004a) of just over 1000 'freshwater recreational users' at least ten[10] respondents had to report use of a waterbody. Lake Taupo topped the list with 250 references, followed by the Lake Rotorua with 55 and Lake Wakatipu at 52. For most waterbodies this represents a very small sample from which to draw any conclusions. Also, the response rate for the survey was only 21.5%.* Three respondents noted the Hurunui River as a recreation destinations and no data were provided on those respondents.
- *Selected recreation groups were requested to respond to an internet-based survey to identify significant waterbodies (Fink-Jensen et al 2004b), and 772 people responded. The threshold was a mention of a waterbody by more than ten people. Canoeists and kayakers were reported by MfE to be well-represented in this survey.* Twelve respondents noted the Hurunui River as a recreation destination. Data were provided on those respondents who mentioned the Hurunui River, as shown in Table 5 below.
- *The presence of a water conservation order* (not applicable).
- *Priority listing as a 'Wetland of national importance to fisheries' in Davis 1987.* The Hurunui is described in the MfE report as having been listed by Davis, but there is no mention of the Hurunui River in Davis' original text. This appears to be an error.
- *Reporting of significance for whitebaiting by a number of key informants.* The report indicated that as many as 70 whitebaiters frequented the river, and noted potential national significance as a result.

The data in Table 5 was presented to describe the responses to the internet survey relating to the Hurunui River (Appendix A of the Fink-Jensen *et al* 2004b report). Note that these responses are from a total pool of 12 individuals, and cannot be generalised to the population.

Table 5: BRC internet survey responses to Hurunui River

Main activity	Most important features	Most limiting factors
Canoeing or kayaking	Beautiful landscape / scenery	Pollution run/off due to surrounding land use
Fishing	Flow of water	
Jet boating	Absence of pollution	Development of area
Rafting	An opportunity to get away from it all	Land ownership change compromising public access.
Swimming	Opportunity to catch fish	Inadequate flow or water level

Catchment-based assessment

In the MfE report, the rational for using a catchment-wide assessment for a river is not made clear. It appears to be a very poor measure.

For example, the Buller River is identified in the report as being of potential national significance by virtue of, amongst other things, a count of over 10,000 angler days for the catchment. No other waterbody in the Buller catchment is described as potentially of national significance, and yet the Buller River *per se* had 2,730 ± 440 angler days in the NAS in 2001/02, and Lake Rotoroa, within the same catchment, had 2,350 ± 470 for the same period. If we were being fussy about the margins of error, the Buller could have had as few as 2,290 angler days, and Lake Rotoroa 2,820. There appears no reason to exclude Lake Rotoroa, if we decided to include the Buller River

[10] The MfE report states 'over 10 people' as a measure in its text (p9), but uses ten (more than nine people) as the threshold in its summary table which presents the relevant rivers.

because of angling activity. Indeed, if Lake Rotoroa is excluded, the catchment count for Buller drops below the threshold. Considering the low angling count for the Buller River, there is no logic in using the NAS data to include that waterbody.

Where a river with *fewer* than 10,000 angler days is within a catchment where another river exceeds the 10,000 angler threshold, the river is not included in the summary of potentially nationally significant waterways, whereas if only the catchment exceeds the threshold, the main river *is* included. For example, in the Tarawera catchment, several waterbodies passed the 10,000 angler day threshold, but Lake Rerewhakaaitiu within that catchment with 8,380 ± 1,320 angler days, is not considered to be potentially nationally significant. Similarly, Lake Arapuni, with 9,730 ± 980 angler days, in the Waikato River catchment, is not considered potentially nationally significant in the MfE report, while the Waikato River is, with 7,240 ± 1,390 angler days.

The Grey River is listed as of potential national significance due to the catchment angling threshold of 10,000 being passed. However, Lake Brunner, within that catchment, had 9,280 ± 910 angler days and the Grey River 6,720 ± 680. Lake Brunner is *not* listed as of potential national significance to recreation due to the angling results of the NAS.

This would not be a problem if the MfE analysis suggested the entire catchment and all its components were of national significance (although that approach would not be acceptable). However, in the resulting summary MfE report *Sustainable water programme of action: Potential water bodies of national importance. Technical Working Paper*, Lake Arapuni, for example, is not listed as of potential national significance for recreation, while the Waikato River is (although the Waikato River has other indicators to suggest it may be of national significance for recreation). Similarly, the Argyle Ponds (a small hydro lake in the Wairau catchment) is not listed as nationally significant, and yet its angling activity is used to increase the angling count on the Wairau River, which with 8410 ± 880 is considered to be potentially nationally significant due to a higher catchment count.

If the catchment count implies significance, its component parts must form a part of that assessment. However, it does not. There is no suggestion that the Argyle Ponds are nationally significant, and there is therefore no logic in adding those numbers to the Wairau River.

There is no reason to exclude such locations as, for example, Lake Arapuni in deference to the Waikato River, or Lake Brunner in deference to the Grey River if angler counts are of relevance. Also, there appears to be no logic in applying a catchment-wide angling activity count to the Buller River, which features a relatively low level of angling pressure.

If the angling counts in the NAS are to be used as an indicator of potential national significance, they must be confined to river-specific counts. The catchment-wide application defies logic when applied to single component rivers.

5.6.2 Waters of national importance for tourism (Ministry of Tourism)

The Ministry of Tourism used the results of their International Visitor Survey (2002 data) and Domestic Travel Survey (DTS) (2001 data) to describe how tourists use freshwater resources in New Zealand, and to locate their activities. The report used these data to develop a list of waterbodies considered to be of national importance for tourism (Ministry of Tourism 2004).

For international tourists, the Ministry identified the top eight locations of importance for freshwater-based activities undertaken by international visitors, including those locations where more than 20,000 visitors participated in the activity in 2002. The regions in decreasing order of importance were:

1. Queenstown	3. Rotorua	5. Te Anau	7. Hanmer Springs
2. Waitomo	4. Taupo	6. Christchurch	8. Auckland

The most popular activities for these visitors included jet boating, visiting glow worm caves and going on scenic cruises.

The data from the DTS showed some parallels between international and domestic visitors and their preferred freshwater locations. The Ministry selected the top four locations from the DTS data, as these were the only statistically significant locations. The top locations for freshwater activity by domestic tourists were:

1. Taupo	2. Hamilton/Waikato	3. Auckland	4. Rotorua

The Hanmer Springs area, assessed as important to international visitors, included the:

- Hanmer River
- Waiau River
- Clarence River
- Percival River
- Pahau River
- Hurunui Lakes

The report states: *"Hanmer Springs is primarily an important tourist attraction for swimming at the thermal pools, Hanmer Springs Thermal Resort, located within the village. The surrounding lakes and rivers are also popular swimming destinations and important water bodies for tourism. Jet boating is the second most popular activity to swimming, with a much smaller number of visitors choosing to participate in river fishing and white water rafting."*

All five of the Hurunui Lakes were identified: Sumner, Sheppard, Taylor, Katrine and Mason. The River itself was not identified.

5.6.3 Sustainable Water Programme of Action: Potential water bodies of national importance. Technical Working Paper (MfE)

This report (MfE 2004b) summarises the findings of a variety of studies into the significance of the nation's waterways, including the two studies listed above (although the technical report apparently pre-dates those).

The technical report notes the following 'assumptions and limitations' in the method applied to identifying waterbodies of potential national significance for recreation:

- *Some of the initial list (survey, angling and whitebaiting information) is based on numbers of people using water bodies for recreational activities. This approach assumes there is a correlation between the number of people who visit a water body and its value for recreation. Under this approach the very special and remote places that are not highly visited may be under represented.*
- *Some of the initial list is based on dated reports or unclear information.*
- *Comparison across the different sources of information may not be a valid approach.*

The technical report lists the Hurunui River as of potential national significance for recreation.

Lakes Sumner, Sheppard, Taylor, Katrine and Mason are identified to be potential water bodies of tourism/scenic value. In addition, the Hurunui River is also listed, although it had not been identified in the source document (Ministry of Tourism 2004).

5.7 New Zealand Recreational River Use Study

Galloway (2008) reported on the findings of a survey of individuals who recreate on and around rivers in New Zealand (New Zealand Recreational River Use Study). Individuals were invited to participate in an internet survey via direct contact at river recreation-related events and electronically via a range of related web sites, group membership, internet bulletin boards, magazines and newspapers. Just over 1300 respondents completed the survey which ran from October 2007 to March 2008.

Twenty three activities were represented in the data, and the dominant respondents were white water kayakers, anglers and multisporters. Respondents were grouped into four broad activity groups: Boating (non-motorised) (55.4%), Fishing (21%), Boating (motorised) (2.4%), and Shore-based (21.2%).

The survey was designed to evaluate respondents' motivations and site preferences, in relation to their level of specialisation in their activity . It was not designed to ascribe values to defined reaches of rivers throughout New Zealand so in that sense, its results must be treated conservatively in the context of this hearing. A list of 1043 rivers was compiled and respondents were asked to indicate up to ten rivers that they had last visited, and the next ten that they wished to visit. This provides a snapshot, rather than a complete picture of the respondents' experiences and views. A total of 4921 such rankings were provided for 513 rivers. Rivers ranked more than 100 times include the Waimakariri (227), Tongariro (191), Buller (154), Hurunui (128), Kaituna (118), Mohaka (116), and Clutha (113). This 'snapshot' shows that the Hurunui is very popular.

When the ranking is broken down by activity group, the ranking order for Boating (non-motorised) was: Waimakariri (106), Tongariro (88), Buller (86), Kaituna (77), Mohaka (58), Hurunui (56). The Waimakariri featured highly here due to its multisport role, particularly with regard to the Coast to Coast event. For the Fishing group, the order was: Tongariro (51), Clutha (21), Hurunui (20).

For each visited river, respondents were asked to rate its scenic beauty, wilderness feeling, degree of challenge, and opportunity to develop Whanaungatanga / companionship, on a 9-point Likert scale. The question was phrased generally, and therefore is not able to take into account the different values supported by different reaches of each river. At best, it provides a general, broad brush impression of the values ascribed to the whole river, compared to the general values ascribed to other rivers.

The Hurunui River was ranked 25th for scenic beauty (a mean of 6.92 within a range of 3.05 for the Avon River to 8.6 for the Arahura River) and 25th for wilderness feeling (a mean of 6.33 within a range of 2.0 for the Avon River to 8.38 for the Whataroa River), out of 71 rivers.

It is important to note, however, that while 513 rivers were identified by respondents as of recreational value, insufficient responses were gained from most of those to support further analysis for these values. The Hurunui River can therefore be described as being in the top half to a third of those rivers most frequently used by respondents, according to the values identified. Rivers with sufficient use to support analysis amounted to only 14% of those identified.

By comparison, other rivers with Water Conservation Orders in place gained the following scores (including the Hurunui for comparison):

- Hurunui: Scenic - 6.92, Wilderness - 6.33
- Buller: Scenic - 6.87, Wilderness - 5.82
- Mohaka: Scenic - 6.9, Wilderness - 6.73
- Rangitata: Scenic - 6.76, Wilderness - 6.37

- Kawarau: Scenic - 6.9, Wilderness 5.67
- Shotover: Scenic 7.84, Wilderness 6.93
- Ahuriri: Scenic 7.10, Wilderness 6.10

In summary, responses in the survey relating to specific rivers, consistently place the Hurunui amongst the top cohort of rivers valued by kayakers.

Respondents were asked to indicate the importance of selected site values in general terms (not specific to any river). The highest rated items were 'clean and unpolluted river water' and 'wilderness character' and 'scenic beauty'. The lowest rated items were the availability of a car shuttle service, and the presence of bathrooms, changing rooms, showers, etc. Large differences were reported in terms of how important the four groups rated the importance of preferred site values. Wilderness values were highest rated among all activity use groups, and facility values lowest. The Fishing group placed significantly greater importance on wilderness values than the other three groups. The Boating (non-motorised) group placed greater importance on social-skill values than the other groups.

Respondents were asked to rate their ability according to what grade of river they could paddle. The majority of Boaters (non-motorised) preferred river sections graded II-IV (67.8%) as opposed to the harder grades V-VI (4.5%) or ungraded rivers (3.0%). Just over 50% selected grades II-III.

5.8 Environment Canterbury Inventory of Values of the Rivers and Lakes in Canterbury

Environment Canterbury has prepared a series of reports and databases on the recreation values within the rivers and lakes of the Canterbury Region. The purpose of the reports and databases was to bring together, into one place, information that was dispersed through published and unpublished literature, and files or knowledge held by individuals.

Two reports are relevant: the *Inventory of Recreational Values of the Rivers and Lakes in Canterbury* (Sutherland-Downing and Elley 2004); and the *Inventory of Instream Values of the Rivers and Lakes in Canterbury* (Daly 2004). The latter present a synthesis of the former and also presents a range of data relating to many values of the waterbodies considered.

Both reports and their underlying databases are stated to be the starting point for future surveys to be carried out by Environment Canterbury. As both are based on existing data and are essentially desktop studies, they come with a long disclaimer[11]. The *Inventory of Instream Values* takes its data for describing recreational and visual amenity values (wild and scenic) from the *Inventory of Recreational Values*.

The *Proposed Canterbury Natural Resources Regional Plan* (July 2004) refers to these studies to support Policy WQN1 Natural State Waterbodies (Section 4.7 this report).

Appendix 1 presents the summary results for the Hurunui catchment from both studies. The recreational use value assessment relies on a measurements of *frequency* and *intensity* of use (definitions for both are provided in Appendix 1). Both are subjective assessments considering the lack of empirical data. The use of the intensity measurement assumes a rating against the

[11] "The inventory report and underlying databases have been compiled using existing sources of information. The accuracy of these sources has not been field checked. The information presented does not necessarily represent or reflect the views of Environment Canterbury. Information in this inventory report and underlying databases should not be relied on for statutory processes without either field checking or reference to the original reference documents cited in Section 5 and consideration of databases held by other parties which have not been represented. While Environment Canterbury has exercised all reasonable skill and care in assembling this information, Environment Canterbury accepts no liability in contract, tort or any other heading of liability for any loss including consequential, financial direct or indirect loss, damage to property or personal injury arising out of the provision of this inventory report and underlying databases. This includes any loss arising from the use of this information by any person who sources it from Environment Canterbury or any loss arising from the use of information that has been incorporated into a third party's report or statement and whether or not the information is accompanied by any general terms and conditions as required by Environment Canterbury."

location's social carrying capacity, which, considering the application of the assessment in other waterbodies where the implication is that the social carrying capacity has been met, is, in my mind, an unsound approach.

The summary of findings from the *Inventory of Instream Values* (Daly 2004), as they relate to visual amenity (wild and scenic) and recreation values, and salmonids, are presented in Table 6.

Table 6: Summary of visual amenity and recreation values and salmonids

Hurunui catchment	Visual Amenity (wild & scenic) and Recreation Values	Salmonids[12]
From the headwaters of the Hurunui River downstream to Lake Sumner/Hoka Kura outlet, and also Lakes Marion, Katrine, Mason, Taylor, Mary, Sheppard, and Raupo Pond.	Visual amenity value is moderate to high. Recreational use value – high for tramping, canoeing, and trout angling; moderate for picnicking/bbq, rafting and big game hunting; and low for sightseeing, walking, camping, horse trekking, bird watching, swimming and salmon angling. Recreational use value for Lake Sumner/Hoka Kura to the confluence with the Mandamus River is high for big game hunting; moderate for walking, tramping, picnicking/bbq, camping, horse trekking, bird watching, jet boating, power boating and trout angling; and low for sightseeing, swimming, jet-skiing, sail boating, salmon angling, eeling and waterfowl hunting. Regarded as a nationally important trout fishery of exceptional quality. Recreational use values for Loch Katrine, and lakes Taylor, Sheppard and Mason are moderate for sightseeing, walking, tramping, picnicking/bbq, camping, horse trekking, swimming, paddling/wading, canoeing and trout angling; and generally low for bird-watching, power boating, rowing, board sailing, eeling and waterfowl hunting. Loch Katrine has moderate use value for jet boating, and Lake Mason has low use value for big game hunting.	River - medium value habitat for resident brown and rainbow trout and for sea-run spawning brown trout and chinook salmon. Rainbow trout population is doubtful. Lake Sumner/Hoka Kura - medium value habitat for brown trout; low value habitat for rainbow trout; and high value habitat for chinook salmon. Other lakes - high value habitats for brown trout. Lakes Katrine and Taylor are low value habitats for rainbow trout and Lake Katrine is a low value habitat for chinook salmon.
North Branch downstream Lake Sumner and upstream of the confluence with the South Branch and including Jollie Brook.	Not reviewed in Sutherland-Downing and Elley (2004) and so not summarised in Daly (2004).	High value habitat for residential, sea-run spawning and sea-run migratory brown trout. Also rainbow trout and sea-run spawning and sea-run migratory chinook salmon. Of national importance.
South Branch upstream of the confluence with the North Branch and including the North Esk River.	Not reviewed in Sutherland-Downing and Elley (2004) and so not summarised in Daly (2004).	High value habitat for brown trout in headwater areas, otherwise medium value habitat. Low value habitat for sea-run migratory chinook salmon. North Esk River - medium value habitat for rainbow trout; and low value habitat for brown trout and chinook salmon.

[12] The accuracy of these data in relation to salmon spawning habitat was challenged at the 2009 Hurunui River Water Conservation Order hearing, Christchurch.

Table 6: Summary of visual amenity and recreation values and salmonids		
Hurunui catchment	**Visual Amenity (wild & scenic) and Recreation Values**	**Salmonids[12]**
North and South branches confluence downstream via Maori Gully to exit from the Hawarden Gorge and including tributaries - Seaward, Glenrae, Mandamus, Glencoe and Dove rivers.	Recreational use value is high for canoeing; moderate for horse trekking, rafting, and trout angling; and low for sightseeing, picnicking/bbq, camping, paddling/wading, jet boating and salmon angling.	River – medium value habitat for resident and sea-run migratory brown trout and sea-run spawning chinook salmon; and low value habitat for rainbow trout. Tributary rivers are generally low value habitats for these fish.
Middle reaches of the Hurunui River from the Hawarden Gorge downstream to the start of the Lowry Peaks gorge and including the tributaries Waitohi and Pahau rivers.	Visual amenity value is generally low with exception to upper parts of this section and through the Lowry Peaks gorge section where it is moderate. Recreational use value is high for trout angling; moderate for picnicking/bbq, jet boating and salmon angling; and low for camping, swimming, paddling/wading, canoeing, rafting, waterfowl and small game hunting, 4WD and trail biking. Waitohi River has moderate value for small game hunting and low value for picnicking/bbq, swimming, paddling/wading, salmon and trout angling and waterfowl hunting. The Pahau River has low value for sightseeing, salmon and trout angling and big game hunting.	Medium value habitat for resident and sea-run migratory brown trout. Main river and tributary rivers (Waitohi and Pahau) - high value for resident and sea-run spawning brown trout; low to medium value habitat for sea-run migratory chinook salmon; and low value habitat for rainbow trout. Salmonids are often salvaged from irrigation races.
Lower reaches of the Hurunui River from and including the Lowry Peaks gorge downstream to the coastal marine boundary.	Recreational use value is high for trout angling; moderate for picnicking/bbq, jet boating and salmon angling; and low for camping, swimming, paddling/wading, canoeing, rafting, waterfowl and small game hunting, 4WD and trail biking.	Main river has medium value for resident brown trout and migratory searun brown trout and chinook salmon, and low value for rainbow trout. Tributaries generally have low value for salmonids.

5.9 Proposed Canterbury Natural Resources Regional Plan (NRRP)

The Proposed Canterbury NRRP (July 2004) (as notified) identifies as 'Natural state rivers': the North Hurunui River and its tributaries upstream of Lake Sumner; the South Hurunui River upstream of Stony River; and the upper reaches of the North Esk River and its tributaries above and including Lucy Stream. Schedule WQN5 defines the 'outstanding and significant characteristics' of the rivers which support Policy WQN1. These are:

- High degree of naturalness
- Within or adjacent to the Southern Alps area of Crown Reserve administered by the Department of Conservation

Lake Summer is classed as a 'Natural state lake', with the 'outstanding characteristics' of:

- High degree of naturalness
- Outstanding natural features and landscapes
- Habitat of threatened/endangered indigenous birds
- High value habitat for chinook salmon
- High visual amenity value
- Statutory acknowledgement

Lakes Taylor and Sheppard are also classed as 'Natural state lakes', with the 'outstanding characteristics' of:

- Outstanding natural features and landscapes
- Habitat of threatened / endangered indigenous birds
- High visual amenity value
- Loch Katrine is also classed as a 'Natural state lake' with the 'outstanding characteristics' of:
- High degree of naturalness
- Outstanding natural features and landscapes
- Habitat of threatened / endangered indigenous birds

None of these 'outstanding and significant characteristics' is related directly to recreation values, besides the chinook salmon in Lake Sumner.

The main stem of the Hurunui River and tributaries from immediately above the Mandamus confluence that are not identified as natural state water bodies are classed as a 'High naturalness rivers' with the 'outstanding characteristics' of:

- High degree of naturalness – above Lake Sumner
- Outstanding natural features and landscapes
- Habitat of threatened/endangered indigenous birds
- High value habitat and spawning habitat for resident and sea run brown trout, high habitat value for chinook salmon spawning – north branch downstream from Lake Sumner
- High visual amenity value, and high value for canoeing, rafting and jet boating
- High value for trout angling
- Statutory acknowledgement

Schedule WQN14 notes significant salmon spawning sites in the Hurunui River system as follows:

- On the River's North Branch from the exit from Lake Sumner to the confluence of the North Branch and Jollie Brook
- Landslip Stream for a distance of approximately 4.25km upstream of the confluence with the North Branch
- Sisters Stream, from Lake Sheppard to its confluence with the Hurunui River
- North Esk River
- Homestead Creek

5.10 Hurunui River Recreation Study 2000/01

A survey of recreational use of the Hurunui River was completed for Environment Canterbury and Fish and Game over the 2000/01 summer period (Greenaway 2001). A summary is provided in Greenaway (2002), from which the following is drawn.

Environment Canterbury's objectives for the study included:

> *To assess the values and recreational opportunities of the Hurunui River Catchment relative to other rivers, lakes and wetlands in the Canterbury region noting anything about*

the natural and amenity values or recreation experience, that is outstanding or significantly different to that which can be experienced elsewhere in Canterbury.

A total of 96 survey-days were spent at four sites (that is, 24 survey days at each site) over peak visitor times: the summer holiday period; Waitangi weekend; Easter; four other weekends and four week days. A total of 903 completed questionnaires was analysed. Opinion relating to the use of waterways was also obtained from interviews with 'key informants'.

The four survey sites were:

- The Hurunui River Mouth, campsite, river beaches and immediate coast,
- State Highway 1 bridge and rest area,
- State Highway 7, Balmoral Campsite and river access areas, and
- Lake Sumner Road at Seaward Bridge.

These areas were identified as the key access points to the study area.

Table 7 shows the number of respondents for each main activity. 'Other' included fishing (mixed river and sea species), dog walking, sightseeing, tramping, jet boating, walking, mountain biking, hunting, horse riding, driving and four wheel driving – each involving less than 5% of all responses. The survey results supported an estimate of almost 34,000 recreational visit days to the river annually.

Table 7: Respondents to Hurunui River Recreation Survey

Main activity	Responses (count)
Trout fishing	170
Camping	158
Swimming	97
Relaxing / holidaying / picnic	78
Taking a break (driving)	70
Kayaking	63
Salmon fishing	53
Other	214
All	*903*

5.10.1 Location of activity

Respondents were asked which section of the Hurunui River they undertook their main activity, and were able to list as many locations as required (1032 locations were named). The locations were recorded on a map on the survey form and grouped under the seven locations:

1. Above Lake Sumner
2. Hurunui Lakes
3. Lake Sumner outlet to Mandamus including the South Branch
4. Mandamus to Pahau
5. Pahau to SH1
6. SH1 to Stoneyhurst
7. River Mouth

The South Branch was not separated out as a specific recreation setting due to limited public access.

The level of use of areas 1, 2 and 3 may have been under-representation due to a high number of 'refusals' at the Lake Sumner Road survey site (where vehicles were waved down by the surveyor, and cars were able to pass while the surveyor was busy). As it was not known how many of these refusals resulted from non-respondents having been previously surveyed, it was difficult to apply an exact factor to correct the result. However, column three in Table 8 (modified percent) shows the relative use of the locations if 50% of the 'refusals' on Lake Sumner Road had not been previously surveyed and their spread of use of the survey is mirrored the survey result proportions for areas 1, 2 and 3.

Table 8 also shows the percent of visit days (number in group multiplied by duration of visit) for each section of the study area. This does not include the 'refusals' data. This shows a similar spread of locations to the 'survey percent' with the exception of a higher figure for area 4 (Mandamus to Pahau). This area includes the popular Balmoral campground which is used by family groups for relatively long periods, hence the greater representation.

Table 8: Location for main activity	Survey percent	Modified percent	Visit days percent
1. Above Lake Sumner	1	1	1
2. Hurunui Lakes	16	21	16
3. Lake Sumner outlet to Mandamus inc South Branch	19	24	16
4. Mandamus to Pahau	23	19	32
5. Pahau to SH1	5	4	5
6. SH1 to Stoneyhurst	20	17	17
7. River Mouth	16	13	13
Total	*100*	*100*	*100*

The following sections provide a summary of results for specific activities, with reference to both survey data and the results of stakeholder interviews.

5.10.2 Trout fishing and salmon fishing

Angling for trout was the most frequently mentioned activity by respondents. Nineteen percent (one in five visitors) described angling as their main activity and another 11% described it as a secondary activity, meaning 30% of visitors did some trout fishing. An additional 4% carried out a mixture of fishing activities, and most included trout. Therefore, one in three visitors was a trout angler (or had intentions to fish).

Angling activity was greatest between the Hurunui mainstem (Lake Sumner outlet to the Mandamus confluence) (31%) and in the Hurunui Lakes area (25%), and lowest at the river mouth (5%) and above Lake Sumner (1%). Forty-one percent of angling effort was below the Mandamus confluence.

Anglers on the River were reasonably 'loyal'[13] and the survey results show that an average of just over 40% of respondents' annual angling effort was spent in the Hurunui River area. The main alternative destinations for angling were the Waimakariri and Rakaia Rivers. The Ashley and Waiau Rivers and the West Coast generally were also important.

[13] 'Loyalty' describes the proportion of activity time spent in the one location. If, for example, an angler spent 80% of their total time angling on the one river, they would be showing a high degree of loyalty to that river.

Twenty-five percent of anglers checked the River level prior to their visit, which suggests a lower sensitivity to river level than kayaking (at 70%) and jet boating (47%).

5.10.3 Camping

Campers stayed an average of 4.2 days within the study area, making camping the highest-ranking activity in the study area for 'visit days' (just over 40% of the total visit days in the study area were contributed by campers). Almost a quarter of all respondents were camping as either their primary or secondary activity.

Camping occurs in several locations in the study area: at sites in the Lakes area, associated heavily with tramping and angling; near the Jollie Brook confluence and associated heavily with kayaking; at the Balmoral Campground near State Highway 7 and associated with a variety of activities (not all river-based); and at the river mouth and associated heavily with salmon fishing.

The survey results showed that 64% of campers in the study area (those who described camping as their main activity) were located between the Mandamus and Pahau confluence. This is, essentially, the Balmoral campground. The other concentration was in the Lakes section of the study area. The number at the River's mouth was low, at 4%. However, the salmon season was poor and a hailstorm on New Year's Eve emptied the campsite. Long-serving visitors to the River mouth reported the season to be one of the worst they could recall.

Campers were quite 'loyal' to the study area, devoting just over 50% of their activity time to the Hurunui River. Nelson and Hanmer were the most popular alternative locations.

5.10.4 Swimming

Swimming as a primary activity was mostly associated with the campground at Balmoral (45%), around State Highway 1, at the Stoneyhurst Bridge and at the river mouth campground. Swimming was recorded as a primary activity by 11% of respondents and as a secondary activity by 16%. The location for secondary activities was not recorded and may have been high for the less accessible areas of the study area (that is, people who visit the river primarily for swimming are likely to carry out the activity in an accessible location). Just over a quarter of visitors swam.

Swimmers were quite 'loyal' and just over 50% of their activity was spent in the study area. This may reflect that swimming, as a 'main activity' is most probably undertaken by local residents. Many alternative locations were named, with the Waiau River and Gore Bay featuring most frequently (although there was little separating all locations in terms of frequency).

5.10.5 Relaxing / holidaying / picnic and rest stop / sightseeing

Nine percent of respondents recorded 'relaxing', 'holidaying' and/or 'picnicking' as their main activity, another 8% recorded 'rest stop' and 2% were 'sightseeing'. Rest stops were focused on the SH7 and SH1 bridges (26% and 72% respectfully). These activities were almost evenly spread throughout the study area, besides the remote locations above Lake Sumner and between the Pahau confluence and SH1.

5.10.6 Kayaking

Kayaking was reported as the main activity by 7% of respondents. Kayaking in the study area was largely confined to the Hurunui Mainstem between the Lake Sumner outlet and the Mandamus confluence, where 86% of kayaking activity was reported. The majority of kayaking took place in Maori Gully.

Minor use of the other study area divisions was recorded, with no use above Lake Sumner and between the Pahau confluence and State Highway 1. The Ethelton Gorge was reported to be used for training but no kayakers were encountered here during the survey.

Kayakers were reasonably 'loyal' and the survey results showed an average of 43% of respondent's annual kayaking time was spent on the Hurunui River. The Buller River and the West Coast generally were mentioned frequently as alternative locations. The Ashley, Rangitata and Waimakariri Rivers also featured, but did not offer the same variety, scenery and safety. The Hurunui had special significance as a relatively safe training river and is used by many institutions, including schools and training providers.

Kayakers were the most sensitive to river levels of all the recreation groups, with 70% of respondents checking the river level prior to their visit.

There was agreement for minimum, preferred and maximum flows amongst kayakers. Tables 9, 10 and 11 present the results for trout and salmon fishing and kayaking in relation to minimum, preferred and maximum river flows on the Hurunui River in cubic metres per second (cumecs or m^2/s). Of note was that relatively few kayakers could name a preferred flow (6). Rather, kayakers were more able to name maximum and minimum flows (32 and 30 respectively), suggesting that sustaining a range of flows between these points was the ideal.

Table 9: Minimum flows by activity - number of responses

Minimum cumecs	0	10	15	20	25	30	35	40	50	60	80	Total
Trout fishing			5	5	2	2		2			1	17
Salmon fishing		1	1	5		6		1				14
Kayaking	1	1	1	12	4	6		1	1		3	30

Table 10: Preferred flows by activity - number of responses

Preferred cumecs	15	20	25	30	35	40	45	50	65	70	75	80	115	120	Total
Trout fishing	1	5	1	1			1		1			1			11
Salmon fishing					1	2									3
Kayaking					1			1			1	1	1	1	6

Table 11: Maximum flows by activity - number of responses

Maximum cumecs	25	40	45	50	60	70	80	90	100	110	120	150	160	200	250	300	400	Total
Trout fishing	1	2				1	2	1	2		1							10
Salmon fishing		1	1		1						1						1	6
Kayaking				1	1	2	1		10	2	4	3	1	5	1	1		32

Interviews completed in 2001 highlighted the importance of the River for kayak training. At the time, most tuition was carried out at the Jollie Brook rapid with schools using the Jollie Brook campground. About ten schools ran camps annually - including Christ's College, Boys' High, Mairehau High, St Bede's Kaiapoi, and the Oxford Area School. Maori Gully was also rafted by schools (two to three rafts at a time).

Kayak tuition was also carried out through the Hawarden Gorge, which includes three rocky drops. There is safe water below this section which means anyone who falls out is not in danger. The get

out for this section is across private land on the true right, just below the Mandamus confluence where the River opens to a braided character opposite the irrigation intake.

It was considered that there are no alternative sites for kayak training in Canterbury that retain a base flow – only the Rakaia, Rangitata and Waimakariri, but none of these had the same gorges and eddies as the Hurunui. The Buller River (also lake-fed) is the only comparable alternative. The Orari and Opihi are adequate for kayak training when flowing, but they require recent rainfall (they are not lake fed). The Rangitata gorge is frequently Grade 4 and is therefore too difficult for training. The Ashley Gorge is interesting to kayakers at between 20 and 50 cumecs minimum, otherwise it is too dry and is also too great a distance between get-in and get-out if anything goes wrong, and so is not ideal for training. It also lacks the variety of Maori Gully.

The section from Jollie Brook to Seaward River has multiple exit points and is relatively safe for training in the event of an accident. The Jollie Brook section is used for slalom events by Canterbury kayak clubs. There are no other areas with slalom set-ups in Canterbury besides the Groynes, which is flatwater.

Ethelton Gorge was also used for training trips and is safe at Grade 2. The get-in is via Cat Hills station (private land) above Ethelton village, and the get-out at State Highway 1. About ten trips per year were run, and it requires same river flows as Maori Gully (17-18 cumecs minimum).

5.10.7 Jet boating

Jet boating was recorded throughout the study area from Lake Sumner downstream, with a minor focus below State Highway 1. Too few jet boaters (15 respondents or 2%) were recorded in the study to offer many findings. The main alternative location recorded for jet boating was the Waimakariri River.

Several club events are held on the River annually, from SH1 and SH7. Maori Gully is a dangerous route and requires reasonable flows to be attempted (a minimum of 80 cumecs). The remainder of the River requires around 25 cumecs to be boatable. Jet or motor boats are used from Loch Katrine to gain fishing access to Lake Sumner via the canal.

The River has a general uplift on boat speed restrictions from source to sea.

5.10.8 Conflicts

The survey reported a very low level of conflict between recreational users of the study area. Only 5% of interactions with other river users were reported as negative, while 78% were considered positive. The remaining 17% were neutral (neither positive nor negative). Negative responses were spread so thinly that it is not possible to conclude that any one activity is incompatible in the area. Jet skiing had only negative interactions listed, but by two respondents.

Low conflict may be the result of several factors. The low but predictable use of the River means social interaction is at the right level to remain an attraction. The ‘social’ nature of the river was the sixth most frequently mentioned reason in the survey for visiting the study area. The different recreational uses of the River are also well-established.

All of the main activities on the River have been carried out for more than several decades and all encounters are therefore part of a normal experience in the study area (that is, pre-existing expectations about a visit to the Hurunui River are invariably met). The River is clearly below its social carrying capacity.

5.10.9 Preferences

The most common reason respondents gave to describe why they undertook their main activity in the study area was ‘location’ (21% of responses). This included such reasons as ‘close to home’,

'convenient location' and 'the location'. A 'pleasant environment' or 'nice area' contributed 16% of responses. Water quality and quantity issues were the third most important reason at 14%. The 'quiet' or 'peacefulness' of the area was the fourth most important factor (12%) followed by fishing (7%).

The River was thought special or unique by 60% of respondents. The main reasons were the pleasant environment (21%), peacefulness (15%), water quality and quantity (12%) and location (11%).

5.10.10 Alternatives

Alternative locations for respondents' main activities were, in decreasing order, the Waimakariri, Rakaia and Ashley Rivers, the West Coast generally, and the Buller, Waiau and Rangitata Rivers. The Waimakariri and Rakaia were the main alternatives for trout fishing. Salmon fishers also used the Rakaia, Waimakariri and Rangitata Rivers (in that order). Kayakers' main alternative was the Buller River.

Although most activities identified in the survey had alternative locations, the Hurunui River was reported by interviewees to have many special features that made the alternatives less attractive. Whitewater kayakers, in particular, noted few options in Canterbury for a relatively safe, accessible and interesting experience as that offered by the upper Hurunui River.

5.10.11 Significance

A 'table of indicators' (Table 12) was developed to describe the 'average' participant in each activity and to assist in assessing the significance for each activity[14]. The term 'loyalty' refers to the proportion of activity time participants spend on the Hurunui River. For example, salmon anglers spent a large proportion (61%) of the total time they spent on the activity on the Hurunui River. By comparison, salmon anglers on the Waitaki River were more loyal at 84%. Similarly, 21% of salmon anglers showed 'total loyalty' by only fishing on the Hurunui and at no other river (the figure for the Waitaki River was 61%). Anglers who fished for salmon, or trout and salmon, were the most 'frequent' visitors to the river (14 and 22 trips annually respectively).

'Localness' was used to describe the percentage of respondents who lived in the Hurunui District. Dedicated salmon anglers, and campers, kayakers and general sightseers were the most likely to have travelled from outside the district. Comparisons given for the Waitaki River, showing recreational visitors there were more likely to be locals (47% compared with 13%) but were far more loyal and visited the Waitaki more frequently – no doubt a function of its larger local population. The Hurunui results show that visitors were willing to travel some distance to use the river with some frequency, implying a degree of recreational significance.

Table 12: Table of indicators for recreation participation, Hurunui River (Waitaki River comparison)

	Loyalty	Total loyalty	Frequency	Localness
Main Activity	**%**	**%**	No.	**%**
Salmon fishing	61	21	14	8
Swimming	52	28	14	33
Camping	51	25	3	6
Trout / salmon fishing	49	18	22	23
Relaxing / holidaying / picnic	48	22	4	9

[14] This approach has subsequently been published in a peer-reviewed leisure research journal on the application of this methodology, in Greenaway (2002).

Kayaking	43	6	5	6
Trout fishing	41	14	6	12
All (inc 'other', Hurunui)	*32*	*20*	*7*	*13*
All (Waitaki River)	*68*	*43*	*32*	*47*

In 2001, the results of the survey, literature review and stakeholder interviews were used to summarise the significance of each recreational activity within each section of the River. Findings for national significance were:

1. Above Lake Sumner:

   Tramping of national significance, with medium levels of use.

   Horse riding of national significance, with medium levels of use.[15]

2. Hurunui Lakes

   Trout fishing of national significance with high levels of use. Noted, in consideration of alternatives: "Other Canterbury high country lakes. But accessible forested lakes rare."

   Tramping of national importance and of medium use.

   Horse riding, as for above Lake Sumner.

3. Lake Sumner outlet to Mandamus inc South Branch

   Trout fishing of national significance with high levels of use. Noted, in consideration of alternatives: "Other regional trout rivers (Waimakariri, Rakaia, Ashley, Waiau). But Hurunui unusual in number of fishing spots and low conflict."

   Kayaking of national importance and with high levels of use. Noted, in consideration of alternatives: "None of equal regionally. Buller River main alternative."

   Horse riding, as for above, with the same caveat.

4. Mandamus to Pahau

   No activity nationally significant, although noted the rest stop option at SH7 as being important.

5. Pahau to SH1

   No activity nationally significant.

6. SH1 to Stoneyhurst

   No activity nationally significant, although noted the rest stop option at SH1 as being important.

7. River Mouth

   No activity nationally significant.

5.11 New Zealand Recreational River Survey

Although almost 25 years old, the *New Zealand Recreation River Survey* (Egarr and Egarr 1981) is often quoted in recreation assessments as it is the only national analysis of recreational values (excluding angling) for rivers available based on actual site visits. As a result of the increased use of plastic kayaks, the growth of commercial rafting and the development of creek boating, many of the assessments made in the study are out of date. However, they can assist when identifying the significance of a waterway at a national scale.

[15] At the time I included an international component to this assessment due to commercial tourism in the area. In retrospect I would now moderate this assessment to regional or national.

In Part I, the authors grouped river sections according to four categories:

Category A: Consisting of all rivers with:
Exceptional recreational value and exceptional scenic value.

Category B: All rivers with:
Exceptional recreational value and impressive scenic value,
High recreational value and exceptional scenic value.

Category C: All rivers with:
Exceptional recreational value and picturesque scenic value,
High recreational value and impressive scenic value,
High recreational value and picturesque scenic value,
Exceptional recreational value and moderate scenic value.

Category D: All rivers with:
High recreational value and moderate scenic value,
Intermediate recreational value and exceptional scenic value,
Intermediate recreational value and impressive scenic value,
Intermediate recreational value and picturesque scenic value.

The Hurunui River was assessed to be of Category D or less for its entire length, including the South Branch.

The full text of the Egarr and Egarr assessment for the Hurunui River from Part III of the study is included in Appendix 2.

Those sections of the Hurunui River which were assessed to have 'high' recreation values were the main stem from Lake Sumner to the South Branch confluence, and from there to the end of the Hawarden Gorge, including Maori Gully. The South Branch was considered to be of 'insignificant' recreation value. The middle and lower sections of the Hurunui were assessed to be of 'intermediate' recreation value.

5.12 Department of Conservation

5.12.1 Conservation Management Strategy

The Department of Conservation (DOC) manages the Lake Sumner Conservation (was Forest) Park within the Hurunui catchment. The Canterbury Conservation Strategy (CMS) 2000, notes in reference to the study area (p44):

> *The Lake Sumner Forest Park includes the upper catchments of the South and North Hurunui, Hope, Doubtful and Nina rivers. In the Hurunui and Hope valleys there is a complex relationship between land managed by the Department and pastoral leasehold land that occupies part of the valley floors. This requires careful management and advocacy by the Department. It is important to maintain present opportunities for recreational use, including access. The Lake Sumner Recreation Hunting Area is popular for deer and chamois hunting. Lake Sumner (Hoka Kura), Loch Katrine, Lake Taylor and Lake Sheppard are among a group of remote high country lakes. The beds of the lakes are Crown land. The lack of permanent settlements in the vicinity is a feature of this area. This makes the Upper Hurunui and lakes distinctly different from other parts of Canterbury. A vehicle track exists to Loch Katrine, and boats can use a connecting stream for access to Lake Sumner. Some modification of the stream has occurred and boat access increases potential aquatic plant pest spread. However, use of this stream reduces the desire for vehicle access to Lake Sumner. The location of private huts, the extent of vehicle access and the types of recreational use are ongoing issues. The lakes and other wetlands also have important ecological values, which will be dealt with in the Department's ongoing*

advocacy role with the regional and district councils. The Conservancy is preparing a management plan for the Loch Katrine Recreation Reserve.

The implementation policies for the Forest Park are (p45):

The Conservancy will:

1. Support the findings of the Hurunui Lakes Working Party, which recognise the area's semi-wilderness and high ecological values.

2. Investigate the development of appropriate shelters at Loch Katrine and Lake Taylor; and plantings for informal camping at Loch Katrine.

3. Maintain a network of public recreation facilities, including tracks, huts, toilets and bridges.

4. Advocate to the Hurunui District Council for methods that avoid, remedy or mitigate the adverse effects of off-road vehicles on natural and historic resources and recreation values.

5. Rationalise the status of land managed by the Department in the vicinity of Loch Katrine Recreation Reserve.

6. Complete, obtain approval and implement the Loch Katrine Recreation Reserve Management Plan to resolve ongoing bach issues.

7. Liaise with Lakes, Lake Taylor, Esk Head and Poplars stations over management issues in the area.

8. Support investigations and applications for a water conservation order for the upper Hurunui River and catchment.

9. Manage aircraft landing concessions to protect the remote character of the area.

5.12.2 Recreation Opportunities in Canterbury

Law (1991a) completed a survey of recreation opportunities in the Canterbury Conservancy to advise a Draft Recreation Strategy (Law 1991b). This was subsequently released by DOC as the Recreation Strategy for Canterbury Conservancy (2004). The final Strategy reviewed the significance of the recreation opportunities managed by the DOC Hanmer Field Centre (pp34-36).

Of local significance was the upper Hurunui River, used by residents of Hawarden/Waikari, 'particularly for fishing and relaxing'.

Of regional significance was the upper Hurunui River (Lake Sumner Forest Park) for hunting, tramping, mountain biking, off-road vehicles and trail bike riders (the latter causing problems for other users of the road). In relation to regionally significant activities, the Strategy noted:

The Upper Hurunui Lakes and Lake Sumner Forest Park is a highly significant outdoor adventure playground, particularly for local people from Hawarden/Waikari, but also for people from Rangiora, Kaiapoi and Christchurch. There is a huge range of activities in this area, because of the diverse natural resource base, the lakes and Hurunui River and their joint fish resource, the proximity of Lake Sumner Forest Park and its recreational hunting area, and the existence of the 4WD access roads. The most popular activities are water and boat based recreation such as waterskiing, fishing, motorboating and canoeing, and traditional backcountry recreation such as tramping, hunting and camping. Other activities include walking, photography, nature appreciation, picnicking, horse riding, windsurfing, sailing and gamebird shooting. The off-road vehicle and mountain biking opportunities are

better and more readily available here than in most other parts of Canterbury. However conflicts with other visitors need to be resolved.

In relation to activities of ‘national and international’ significance, the Strategy noted:

The Hurunui River has a national grade slalom course. It is very popular with canoeists from throughout Canterbury, as well as having hosted the South Island and national slalom champs. It has highly significant trout fishing opportunities, with a high use and notable scenic beauty and solitude (Teirney et al. 1989).

The track up the Hope River to Kiwi Stream, Lake Sumner, Hurunui River and Harper Pass to the Taramakau in Arthur's Pass National Park has potential for development as a significant named tramping track popular with both international and domestic backpackers.

6 References

Allan, S., Booth, K. 1992. *River and lake recreation: issues, research priorities and annotated bibliography*. Environmental Planning and Assessment, Wellington.

Boffa Miskell Ltd, 2009. *Hurunui Water Project Assessment of Ecological Effects*. Prepared for: Hurunui Water Project Ltd

Bonnett, M.L., Davis, S.F., Unwin, M.J. 1991. *Angler surveys of the Hurunui River, 1979/80 – 1981/82.* New Zealand Freshwater Fisheries Report No. 123. MAF Fisheries, Christchurch.

Busch, T. 2003. *Trout Fishing, A Guide to New Zealand's South Island,. 5th Edition.* David Bateman.

Canard, H. 2009. Evidence at the Hurunui River Water Conservation Order, Christchurch. Held by Ministry for the Environment, Wellington.

Charles, G. 2006. *New Zealand Whitewater, 125 great kayaking runs.* Craig Potton Publishing.

Daly, A. 2004. *Inventory of Instream Values of the Rivers and Lakes in Canterbury.* Environment Canterbury U04/13.

Davis, S.F. 1987. *Wetlands of national importance to fisheries.* New Zealand Freshwater Fisheries Report No. 90. MAF Fisheries, Christchurch.

Department of Conservation. 1994. *Recreation Strategy for Canterbury Conservancy*. DOC, Christchurch.

Department of Conservation. 2003. *Towards a better network of visitor facilities. Canterbury Conservancy proposal summary*. DOC, Wellington.

Department of Conservation. 2004. *Canterbury Conservancy recreation opportunities review submissions analysis and decisions*. DOC, Wellington.

Egarr, G. 1995. *New Zealand's South Rivers, A Guide for Canoeists, Kayakers and Rafters.* Nikau Press.

Egarr, G.D, Egarr, J.H. 1981. *New Zealand Recreational River Survey Parts I, II and III*. Water & Soil Division, Ministry of Works and Development.

Environment Canterbury 2004. *Proposed Canterbury Natural Resources Regional Plan* (NRRP). ECan, Christchurch.

Fink-Jensen, K. Johnson, M. Simpson-Edwards, M. 2004a. *Freshwater recreational users. Survey of freshwater use in New Zealand*. BRC Marketing & Social Research for MfE.

Fink-Jensen, K. Johnson, M. Simpson-Edwards, M. 2004b. *Freshwater recreational users. Internet survey of freshwater use in New Zealand*. BRC Marketing & Social Research for MfE.

Galloway, S. 2008. *New Zealand Recreational River Use Study: Specialization, Motivation and Site Preference*. School of Physical Education University of Otago.

Giles, R. 2000. *Hooked on Trout, How are Where to Catch Large Trout in New Zealand*. Reed Publishing (NZ) Ltd.

Giles, R. 2002. *Catch That Trout, Fishing the South Island of New Zealand.* Reed Publishing (NZ) Ltd.

Gill-Fox, I. 2009. Evidence at the Hurunui River Water Conservation Order, Christchurch. Held by Ministry for the Environment, Wellington.

Greenaway, R. 2001. *Hurunui River Recreation Study 2000/01*. Fish and Game Council and Environment Canterbury

Greenaway, R. 2002. *Measuring Significance of Outdoor Recreation Areas,* in Annals of Leisure Research Vol. 5, 2002, 65 – 79.

Grindell and Guest (eds) 1986 *A list of rivers and lakes deserving inclusion in a schedule of protected waters*. Water and soil miscellaneous publications No.97

Grindell, D.S. (ed) 1984. *A national inventory of wild and scenic rivers.* Water and Soil Directorate, Ministry of Works and Development.

Jet Boating New Zealand, 2009. Statement of evidence presented at Hurunui River Water Conservation Order hearing, Christchurch.

Kelly, G.R. 1988. *An inventory of whitebaiting rivers in the South Island.* New Zealand Freshwater Fisheries report No. 101. MAFFish, Christchurch.

Kennett, J., Kennett, S., Kennett, P., Morgan, P. 2002,. *Classic New Zealand Mountain Bike Rides, Ed 5.* Kennett Brothers, Wellington.

Kent, J. 2006. *South Island, Trout Fishing Guide.* Reed Publishing (NZ) Ltd.

Kent, J. Magnano Madsen, P. 2003. *New Zealand's Top Trout Fishing Waters*. Reed Publishing (NZ) Ltd.

Law, E. 1991a. *Recreation Opportunities in Canterbury. Volume I – The Recreation Opportunity Survey*. DOC, Christchurch.

Law, E. 1991b. *Recreation Opportunities in Canterbury. Volume II – Draft Recreation Strategy*. DOC, Christchurch.

Millichamp, R. 1997. *Salmon Fever. A Guide to Salmon Fishing in New Zealand.* Shoal Bay Press.

Ministry for the Environment. 2004a. *Potential Water Bodies of National Importance for Recreation Value.* MfE number 559. Wellington.

Ministry for the Environment. 2004b. *Sustainable Water Programme of Action: Potential water bodies of national importance. Technical Working Paper.* MfE number 562. Wellington.

Ministry of Tourism. 2004. *Waters of national importance for tourism*. Ministry of Tourism, Wellington.

Moore, C. 2002. *Weekends for trout fishing in New Zealand*. New Holland.

Mosley, P. 1982. *Critical depths for passage in braided rivers, Canterbury, New Zealand*, in New Zealand Journal of Marine and Freshwater Research, 1982, Vol. 16 : 351-357.

Pattle Delamore Partners, 2009. *Assessment of Environmental Effects: Hydrology and Irrigation Demand for the Hurunui Water Project*. Prepared for: Hurunui Water Project

Peter Rough Landscape Architects, 2009. *Hurunui Water Project Assessment of Landscape and Visual Effects.* Prepared for: Hurunui Water Project Ltd

Sibly, K., Wilson, M. 1996. *4WD South Island – 77 Off Road Adventures*. Shoal Bay Press, Christchurch.

Sibly, K., Wilson, M. 1999. *4WD South Island – 93 New Off Road Adventures*. Shoal Bay Press, Christchurch.

Sutherland-Downing, V. Elley, R. April 2004 (revised by Daly, A). *Inventory of Recreational Values of the Rivers and Lakes in Canterbury*. Environment Canterbury U04/14.

Teirney, L.D. Richardson, J. Unwin, M.J. 1987. *The relative values of North Canterbury Rivers to New Zealand anglers*. Fisheries Environmental Report No. 89. NZ Ministry of Agriculture and Fisheries. Wellington.

Teirney, L.D., Unwin, M.J., Rowe, D.K., McDowall, R.M., Graynoth, E. 1982. *Submission on the draft inventory of wild and scenic rivers of national importance*. Ministry of Agriculture and Fisheries. Fisheries Environmental Report No. 28.

Unwin, M.J. 2009a. Statement of evidence presented at Hurunui River Water Conservation Order hearing, Christchurch. Held by Ministry for the Environment, Wellington.

Unwin, M.J. 2009b. *Angler usage of lake and river fisheries managed by Fish & Game New Zealand: results from the 2007/08 National Angling Survey*. NIWA Christchurch

Unwin, M.J., Image, K. 2003. *Angler usage of lake and river fisheries managed by Fish and Game New Zealand: results from the 2001/02 National Angling Survey.* NIWA Christchurch.

Unwin, M.J., Brown, S. 1998. *The geography of freshwater angling in New Zealand: A summary of results from the* 1994/96 *National Angling Survey.* NIWA Christchurch

7 Appendix 1: Summary tables for the Hurunui River from Environment Canterbury Instream and Recreational Value assessments

Sutherland-Downing, V. Elley, R (revised by Daly, A). April 2004. *Inventory of Recreational Values of the Rivers and Lakes in Canterbury*. Environment Canterbury U04/14 (pp35-42).

Daly, A. April 2004. *Inventory of Instream Values of the Rivers and Lakes in Canterbury.* Environment Canterbury U04/13 (pp18-20).

Recreation use value (frequency and intensity of use for specified types of recreation use):

Frequency of use

The frequency or *how often* a river or lake is used for recreation contributes to the recreation value of the water body.

(a) High - used for recreation continuously throughout the year.

(b) Moderate - used during certain times of the year.

(c) Low - few or infrequent visits; generally used when other preferred areas are not used.

Intensity of use

The intensity of use relates to the *number* of people who use the water-body or part water-body for a particular type of recreation. The term “maximum holding capacity” has been used to describe the number of people that can comfortably use the site for recreation, if the number of people at a site exceed the maximum holding capacity users satisfaction decreases, competition for resources increases and conflict between users may increase. The number of people a site can accommodate depends on the type of recreation, the variation and combination of recreation activities, and the physical setting of the water-body itself.

(a) High - the maximum holding capacity of recreational users is often met (relative to water-body size).

(b) Moderate - large numbers of recreational users (relative to water-body size).

(c) Low - small numbers of recreational users (relative to water-body size).

Fishing and hunting abundance of target species

The abundance of target species contributes to the satisfaction gained from a successful catch or hunt. The satisfaction of the experience will influence a users motivation to visit and return to that area for fishing or hunting. In the inventory, the abundance of target species is categorised as very common, common and uncommon, and the particular target species is denoted by a superscript abbreviation as given in the following table.

s	salmon	*cf*	coarse fish	*f*	other fish
t	trout	*fl*	flounder	*wf*	waterfowl
bc	brook char	*m*	mullet	*q*	quail
wh	whitebait	*p*	perch	*sg*	small game
e	eels	*sp*	splake	*bg*	big game

Hurunui River Catchment	Recreation Physical Value			Recreation Use Value Frequency / Intensity																																						
				Passive							Contact			Mechanised Water Craft				Paddling & Floating Water Craft					Sail Water Craft			Fishing & Hunting								Off-road Vehicles					Other	
	Water Quality	Scenic Appeal	Natural Appeal	Sightseeing	Walking	Tramping	Picnicking / Barbeque	Camping	Horse Trekking	Bird-watching	Swimming	Paddling / Wading	Diving	Jet Boating	Water Skiing	Jet Skiing	Power Boating	Canoeing / Kayaking	Rafting	Floating	Drift Boating	Rowing	Sail Boating	Board Sailing	Kite Sailing	Salmon	Trout	White-baiting	Eeling	Other Fishing	Waterfowl	Small Game	Big Game	Four-wheel Driving / ATV	Trail Biking	Mountain Biking	Dune Buggies	Land Sailing	Multi-sports	Ice Skating
Upper Hurunui River, headwaters to South branch confluence	H	H	H	L L	L L	H M	M L	L L	L L	L L	L L							H H	M M							L L	H H					M M							
Lake Sumner	H	H	H	L L	M M	M M	M M	M M	M M	M L	L L			M M	L L	L L	M M	L L					L L			L L	M M		L L		L L		H H						
Loch Katrine	H	H	H	M M	M M	M L	M H	M H	M M	L L	M M	M M		M M	L L		M M	M M				L L			L L			M M		L L		L L								
Lake Taylor	H	H	H	M M	M M	L L	M H	M H	M M	L L	M M	M M		M M	L L		L L	M M				L L			L L			M M		L L		L L								
Lake Sheppard	H	H	H	M M	M M	L L	M H	M H	M M	L L	M M	M M		M M	L L		L L	M M				L L			L L			M M		L L		L L								
Lake Mason	H	H	H	M M	M M	L L	M H	M H	M M	L L	M M	M M		L L	L L		L L	M M				L L			L L			M M		L L		L L							L L	
Mid Hurunui River, South branch confluence to Mandamus River confluence	H	H	H	L L			L L	L L	M L			L L		L L				H H	M M							L L	M M													

Hurunui River Catchment	ATTRIBUTES																																				
	Travel Time (from major population centre)			Facilities				Accommodation				Fishing and hunting abundance of target species			Channel features							Flow strength				Flow conditions supporting recreation		Obstructions		Accessibility								
																															Along Bank/ Bed		Road to/from waterbody			Boat		
	Close (<30 min)	Moderate (< 1 hr)	Far (> 1 hr)	Extensive	Many	Some	Limited	Camping	Tramping hut	Caravan/ Camper-van	Crib/ Batch	Very common	Common	Uncommon	Shallows	Waterfall	Shallow rock drop	Rock obstacles	Riffles	Rapids	Pools	Sluggish	Moderate	Strong	Powerful	Year-round	Certain times of year	Bankside willows	Bank/bed obstructions	Good access	Limited access	Good access	Moderate access	Private access	Good access	Moderate access	Limited access
Upper Hurunui River, headwaters to South Branch confluence			•				•	•	•			• t s	• wf	• bg	•			•	•	•	•		•			•				•		•			•		
Lake Sumner			•				•	•					• wf t s	• bg																•			•		•		
Loch Katrine			•			•		•		•	•	• t	• wf																	•		•		•	•		
Lake Taylor			•				•	•		•		• t	• wf																	•		•		•	•		
Lake Sheppard			•				•					• t	• wf																	•		•		•	•		
Lake Mason			•				•	•	•			• t	• wf	• bg																•		•		•	•		
Mid Hurunui River, south branch confluence to Mandamus River confluence			•				•	•					• s t		•			•	•	•	•			•		•				•		•			•		

Hurunui River Catchment	Recreation Physical Value			Recreation Use Value Frequency Intensity																																					
				Passive							Contact			Mechanised Water Craft				Paddling & Floating Water Craft					Sail Water Craft			Fishing & Hunting								Off-road Vehicles					Other	
	Water Quality	Scenic Appeal	Natural Appeal	Sightseeing	Walking	Tramping	Picnicking / Barbeque	Camping	Horse Trekking	Bird-watching	Swimming	Paddling / Wading	Diving	Jet Boating	Water Skiing	Jet Skiing	Power Boating	Canoeing / Kayaking	Rafting	Floating	Drift Boating	Rowing	Sail Boating	Board Sailing	Kite Sailing	Salmon	Trout	White-baiting	Eeling	Other Fishing	Waterfowl	Small Game	Big Game	Four-wheel Driving / ATV	Trail Biking	Mountain Biking	Dune Buggies	Land Sailing	Multi-sports	Ice Skating
Lower Hurunui River, Mandamus River confluence to suspension bridge at mouth	M	M	M				M M	L L			L L	L L		M H				L L	L L							M M	H H				L L	L L							
Waitohi River	M	M	L				L L				L L	L L														L L	L L				L L	M M							
Pahau River	L	M	M				L L																			L L	L L						L L							
Hurunui River suspension bridge to Mouth	L	H	M	L L	L L		L L	M M			L L	L L		M M		L L	L L	L L					L			H H	M M	M M	L L	L L										

Hururui River Catchment	ATTRIBUTES																																				
	Travel Time (from major population centre)			Facilities				Accommodation				Fishing and hunting abundance of target species			Channel features							Flow strength				Flow conditions supporting recreation		Obstructions		Accessibility								
																															Along Bank/ Bed		Road to/from waterbody			Boat		
	Close (<30 min)	Moderate (< 1 hr)	Far (> 1 hr)	Extensive	Many	Some	Limited	Camping	Tramping hut	Caravan/ Camper-van	Crib/ Batch	Very common	Common	Uncommon	Shallows	Waterfall	Shallow rock drop	Rock obstacles	Riffles	Rapids	Pools	Sluggish	Moderate	Strong	Powerful	Year-round	Certain times of year	Bankside willows	Bank/bed obstructions	Good access	Limited access	Good access	Moderate access	Private access	Good access	Moderate access	Limited access
Lower Hururui River, Mandamus River confluence to suspension bridge at mouth			•			•		•		•			• s t sg	• wf	•				•	•	•		•			•		•		•		•		•			
Waitohi River			•			•							• t q	• wf s					•		•		•			•		•		•		•					
Pahau River			•				•						• t	• bg s	•				•		•		•			•		•	•		•		•	•				
Hururui River suspension bridge to mouth			•		•			•		•	•		• wh s t		•				•		•		•			•				•		•			•			

Hurunui Catchment Page 1 of 2	Landscape Values		Aquatic Ecosystem Values							
				Indigenous Fauna #Threatened species (DoC, 2002; Ref 4)						
	Natural Character[3, 14]	Outstanding Natural Features & Landscapes [2, 3, 13]	Indigenous Plants[7, 9]	Invertebrates[1]	Birds [4, 5, 9]	Fish[4, 6, 9]	Other [4, 10]	Salmonids[11]	Visual Amenity (wild and scenic) and Recreation Values [2, 3, 12, 14]	Educational Scientific Heritage Values[15]	Tangata Whenua Values[17, 18, 19, 20]
From the headwaters of the Hurunui River downstream to Lake Sumner/Hoka Kura outlet, and also Lakes Marion, Katrine, Mason, Taylor, Mary, Sheppard, and Raupo Pond.	High degree of naturalness - largely unmodified. Single-channel to braided reaches including shallows, rapids, riffles and pools. Indigenous riverbed communities. Mix of highly natural and semi natural areas. Invasion by exotic plant species - upstream of Lake Sumner/Hoka Kura - hawthorn, gorse and ragwort; Raupo Pond - willows; Lake Taylor - gorse and willows at outlet. Some modification to riparian margins.	High (outstanding) value. Native forest mountain landscape of substantial beauty because of scale and drama of natural processes and clarity of lake and river water.	Riparian margin beech forest, mataqouri and tussock communities in headwaters including tributaries. River gravel/fan/terrace riser tree and scrub plant types but predominantly exotic species. Periphyton (including diatoms, mosses, filamentous algae, cyanobacteria and detritus) in river - moderate amounts can develop when flows are low. Lakes have high green filamentous algae diversity.	Mayfly, stoneflies, net-winged midges, scorpion flies, toebiter, caddisflies and sandflies. Snail (*Potomopyrgus sp.*) and dragonflies in lakes.	River - feeding, roosting and breeding of open water divers; feeding and roosting of waterfowl; and feeding of gulls and terns and #Black-fronted terns. Lakes - feeding, roosting and breeding of open-water divers, waterfowl and #Southern crested grebe; feeding and roosting of gulls and terns; and feeding of #Black-fronted terns.	River - upland bully, Canterbury and alpine galaxias, #Longfinned eel, and koaro. Lake Marion - common smelt and upland bully. A faunistic reserve free of introduced fish. Other lakes - koaro, upland bully and eels. Common smelt is also present in Lake Sumner.		River - medium value habitat for resident brown and rainbow trout and for sea-run spawning brown trout and chinook salmon. Rainbow trout population is doubtful. Lake Sumner/Hoka Kura - medium value habitat for brown trout; low value habitat for rainbow trout; and high value habitat for chinook salmon. Other lakes - high value habitats for brown trout. Lakes Katrine and Taylor are low value habitats for rainbow trout and Lake Katrine is a low value habitat for chinook salmon.	Visual amenity value is moderate to high. Recreational use value – high for tramping, canoeing, and trout angling; moderate for picnicking/bbq, rafting and big game hunting; and low for sightseeing, walking, camping, horse trekking, bird watching, swimming and salmon angling. Recreational use value for Lake Sumner/Hoka Kura to the confluence with the Mandamus River is high for big game hunting; moderate for walking, tramping, picnicking/bbq, camping, horse trekking, bird-watching, jet boating, power boating and trout angling; and low for sightseeing, swimming, jet-skiing, sail boating, salmon angling, eeling and waterfowl hunting. Regarded as a nationally important trout fishery of exceptional quality. Recreational use values for Loch Katrine, and lakes Taylor, Sheppard and Mason are moderate for sightseeing, walking, tramping, picnicking/bbq, camping, horse trekking, swimming, paddling/wading, canoeing and trout angling; and generally low for bird-watching, power boating, rowing, board sailing, eeling and waterfowl hunting. Loch Katrine has moderate use value for jet boating, and Lake Mason has low use value for big game hunting.	Geopreservation Sites - Upper Hurunui River and Mackenzie Stream tributary hot springs of regional scientific, educational and aesthetic value. Geopreservation Site - Lakes Sumner/Hoka Kura, Katrine, Mason, Sheppard and Taylor are excellent examples of lake features in a formally glaciated environment. National scientific, educational and aesthetic value. Geopreservation Site - Lake Sumner/Hoka Kura Torlesse structures (folding, faulting and lithology) bankside exposures. National educational/ scientific value.	Statutory acknowledged pursuant to Section 206 of the Ngai Tahu Claims Settlement Act 1998 (NTCSA) Schedule 20 for Hoka Kura/Lake Sumner and Schedule 21 for the Hurunui River. Cosmological link per the formation of the lakes of Te Wai Pounamu - lakes were dug by the chief Rakaihautu. Likely to have been named after one of his descendents. <u>General</u> Traditional route to the west coast (via lakes and upper river). River below confluence with the Mandamus River and to the coast has medium value, otherwise of high value. <u>Mauri</u> Key indicators include: • capacity to renew groundwater flow and surface water stocks; • maintaining mahinga kai species and fresh water habitats, including passage for migratory fish species; • flow variability including floods so that river "cleanses" itself; and • continuity of flow from source to sea. • naturalness of water quality. Wahi tapu and taonga Wahi tapu and urupa sites in this area. Historic associations. Waters used for rituals. Maori Gully is a section of the greenstone trail to the west coast (artefacts found). Nohanga (settlements) were located at points along the length of the river. Archaeological sites (two known) associated with the Mandamus River - artefacts found [Hurunui DC Sites A44, A45]. <u>Mahinga kai</u> Traditionally important for tuna (eel) and inanga. Modified and depleted and not so important now. Lake Sumner/Hoka Kura used by North Canterbury Ngai Tahu. Statutory acknowledged nohanga site pursuant to Section 256 of NTCSA Schedule 95 - Site No[6] 4 (Hurunui River, ~1km inland of the coast).
North Branch downstream Lake Sumner and upstream of the confluence with the South Branch and including Jollie Brook.	Moderate degree of naturalness. Single channel to braided reaches including shallows, rapids, riffles and pools. Mix of highly natural and semi natural areas. Invasion by exotic plant species - willows, hawthorn, gorse and broom.	Moderately low value.			Important: feeding for open-water divers, waterfowl, gulls and terns and #Black fronted tern; and roosting of open-water divers and waterfowl.	Significant resident and spawning habitat for upland bully and eels.	Single sighting of #Long-tailed bat in Jollie Brook.	High value habitat for residential, sea-run spawning and sea-run migratory brown trout. Also rainbow trout and sea-run spawning and sea-run migratory chinook salmon. Of national importance.			
South Branch upstream of the confluence with the North Branch and including the North Esk River.		Moderate value.				Canterbury and alpine galaxias.		High value habitat for brown trout in headwater areas, otherwise medium value habitat. Low value habitat for sea-run migratory chinook salmon. North Esk River - medium value habitat for rainbow trout; and low value habitat for brown trout and chinook salmon.			
North and South branches confluence downstream via Maori Gully to exit from the Hawarden Gorge and including tributaries - Seaward, Glenrae, Mandamus, Glencoe and Dove rivers. Seven Hills Pond	Moderately high to high degree of naturalness downstream of the branch confluence and tributaries. Single channel reaches including gorges, shallows, rock obstacles, riffles, rapids and pools. Mix of highly natural and semi natural areas. Invasion by exotic plant species - willows, hawthorn, gorse and broom. Downstream from Mandamus River confluence - nassella tussock.	Moderately high to high (outstanding) value especially in gorge sections below Branch confluence - Maori Gully gorge and Hawarden Gorge sections.			#Blue duck/Whio habitat in the Mandamus River and its Silver Brook tributary and in the Dove River.			River – medium value habitat for resident and sea-run migratory brown trout and sea-run spawning chinook salmon; and low value habitat for rainbow trout. Tributary rivers are generally low value habitats for these fish.	Recreational use value is high for canoeing; moderate for horse trekking, rafting, and trout angling; and low for sightseeing, picnicking/bbq, camping, paddling/wading, jet boating and salmon angling.		

Hurunui Catchment Page 2 of 2	Landscape Values		Aquatic Ecosystem Values						Visual Amenity (wild and scenic) and Recreation Values [2, 3, 12, 14]	Educational Scientific Heritage Values [15]	Tangata Whenua Values [17, 18, 19, 20]
	Natural Character [3, 14]	Outstanding Natural Features & Landscapes [2, 3, 13]	Indigenous Plants [7, 9]	Indigenous Fauna #Threatened species (DoC, 2002; Ref 4)) Invertebrates [1]	Birds [4, 5, 9]	Fish [4, 5, 9]	Other	Salmonids [11]			
Middle reaches of the Hurunui River from the Hawarden Gorge downstream to the start of the Lowry Peaks gorge and including the tributaries Waitohi and Pahau rivers.	Moderately low degree of naturalness in braided sections of the river. Riffles, rapids, pools and shallows. Low flows are influenced by abstractions. Riparian margins modified by human activity - exotic plants are dominant - willows, hawthorn, gorse and broom. Downstream of the Waitohi River confluence - old man's beard, blackberry and briar.	Moderate scenic value in the upper parts of this section and through Lowry Peaks gorge section of the river. Braided sections either side of the Lowry Peaks gorge have low scenic value but contribute to the Canterbury identity.		Sandflies, mayflies, toebiter and caddisflies. Also cranefles, midges, elmid beetles and snails.	Important: feeding, breeding and roosting for deep and shallow water waders, gulls and terns, #Black fronted tern and #Banded dotterel ; feeding and roosting for open water divers, waterfowl and riparian species.	Koaro, torrentfish, upland bully, #Longfinned eel and Canterbury galaxias.		Medium value habitat for resident and sea-run migratory brown trout. Main river and tributary rivers (Waitohi and Pahau) - high value for resident and sea-run spawning brown trout; low to medium value habitat for sea-run migratory chinook salmon; and low value habitat for rainbow trout. Salmonids are often salvaged from irrigation races.	Visual amenity value is generally low with exception to upper parts of this section and through the Lowry Peaks gorge section where it is moderate. Recreational use value is high for trout angling; moderate for picnicking/bbq, jet boating and salmon angling; and low for camping, swimming, paddling/wading, canoeing, rafting, waterfowl and small game hunting, 4WD and trail biking. Waitohi River has moderate value for small game hunting and low value for picnicking/bbq, swimming, paddling/wading, salmon and trout angling and waterfowl hunting. The Pahau River has low value for sightseeing, salmon mand trout angling and big game hunting.		
Lower reaches of the Hurunui River from and including the Lowry Peaks gorge downstream to the coastal marine boundary. Kaiwaro River.	Through the Lowry Peaks gorge section the degree of naturalness is moderate. Invasion by exotic plant species - willows, hawthorn, gorse and broom. Rock obstacles, riffles, rapids and pools. Flows are highly variable (moderate to strong).		Periphyton (including diatoms, filamentous algae, cyanobacteria and detritus) - significant proliferations can develop when flows are low.	Mayflies, range of caddisfly species, toebiter and cranefles.		Upland bully, Canterbury galaxias, #Longfinned eel and shortfinned eels. Common bully present east of Lowry Peaks gorge section. Stockell smelt and Yellow eyed mullet (Charteris DOC pers., comm., 2004).		Main river has medium value for resident brown trout and migratory sea-run brown trout and chinook salmon, and low value for rainbow trout. Tributaries generally have low value for salmonids.	Recreational use value is high for trout angling; moderate for picnicking/bbq, jet boating and salmon angling; and low for camping, swimming, paddling/wading, canoeing, rafting, waterfowl and small game hunting, 4WD and trail biking.	Geopreservation Site - Ethelton Conglomerate exposure upstream of the confluence with the Waikari River. Regional scientific and educational value. Geopreservation Site - Ethelton School Miocene shellbed. One of the best sits of this age in Canterbury. True left bank of Kaiwaro River. Regional educational/ scientific value. Geopreservation Site - Limestone Glens cannon-ball concretions. Rare example of concretions in massive sandstone. Small tributary of Kaiwaro River. Regional educational/ scientific value.	

8 Appendix 2: Complete extract from Egarr and Egarr 1981: New Zealand Recreational River Survey Part III.: Hurunui River.

146.0 HURUNUI RIVER

The Hurunui River rises on the main divide on the eastern slopes of the Harper Pass. The South Branch, a smaller tributary, lies to the south on the main divide and flows north-cast to join the main stream. In the headwaters of the North Branch lie several lakes of which Lakes Sumner and Taylor are the largest and best known. The North Canterbury Electric Power Board propose to place a dam at the confluence of the North and South Branches to form a hydro reservoir back to link up with Lake Sumner. From the confluence, the Hurunui flows though a number of dramatic gorges before entering the Culverden Plains where the Mandamus, Waitohi and Pahau Rivers join the main stream. The river continues through another gorge before entering the sea. The Hurunui offers facilities for the full range of river-based activities and is a particularly valued recreational river. The river has been considered in six sections as well as the various tributaries.

146.1 UPPER HURUNUI AND LAKES

Location: From Harper Pass on the main divide the Hurunui River flows directly cast down a well defined valley to Lake Sumner beside the Crawford Range.

Section end location: NZMSI, S53/693547

Length: 37km (includes Lake).

Recreational use: The river above Lake Sumner is not used a great deal. Canoeists, rafters and drift boaters would have to portage upstream in order to paddle down, and the river is somewhat like the Hope and Waiau which are more accessible. Trampers use the area greatly and float down parts of the river before the shallow shingle lower reaches are met and the river lows into the lake. The lower section of the river is often too hallow for jet boaters to get beyond the lake itself.

Lake Sumner is a very popular boating area. Jet boats often lunch into the lake if they haven't already come upstream through the gorge. Canoeists use the lake a great deal and the boys' Brigade often hold their annual camps in the area and canoe on the lake. Scouts and the physical education department of the teachers college have used the lake for canoeing)o. Canoeists also use the lake as a means of access to the river below. The water can be very cold and swimming is limited to ie hotter, late summer period.

Scenic description: The upper Hurunui flows over a rocky bed through a beech-clad valley that is most attractive. As the gradient of the river decreases, it flows out onto a fine gravel between grassy river flats that become very wide immediately -fore entering Lake Sumner. The flats gradually shelve into the shallow head of the lake forming a marshy margin as it meets the lake. Much of the lake shore is beech-clad and is very attractive. Strong winds can ruffle the lake waters and create problems for boaters. Tussock-covered hills stand above the tree-line. Lakes Mason, Katrine, Taylor and Sheppard lie in grassy basins to the south of Lake Sumner.

Scenic value: Impressive.

Recreational value: Intermediate.

146.2 HURUNUI RIVER – SUMNER TO SOUTH BRANCH

Location: From Lake Sumner the Hurunui flows south through tussock country to junction with the South Branch. Section end location. NZMSI, S60/761423

Length: 17km.

RECREATIONAL USE:

Motor launches: Too shallow with boisterous rapids.

Jet boats: Considerable use by experienced boaters. This is a particularly valuable piece of jet boating water for the experienced jet boater. It contains a number of steep rapids and large waves to be negotiated, ending with a short lake trip to the launching ramp on the Lake Sumner shore. The river is generally used in an upstream direction with only a few trips being made downstream.

Drift boats, rafts: Used to some degree. Considered straight- forward and a good 'warm-up' for the bigger rapids below the Seaward Stream confluence. Some shallow rapids below Jollie Brook may need to be portaged.

Canoes/kayaks: A very valuable section of water with the South Island National Slalom site situated below Jollie Brook. This slalom course is noted as being suitable for novice as well as experienced slalom canoeists.

Camping facilities are available here but not in the lower river. The gorge above the Jollie Brook is noted for its steep rapids that are navigable by the less experienced, and they are far more gentle than those below the Seaward Stream which re- quire a fair degree of skill.

Pack floating: Used a good deal, especially from Jollie Brook down to the South Branch confluence, after which the river becomes very powerful and boisterous, and too hazardous for liloes.

Swimming: A number of good pools.

Scenic description: From Lake Sumner the Hurunui flows out in a gravel bed through patches of beech forest and tussock grassland on the river flats. A great deal of matagouri scrub covers the flats and the hillsides. There are isolated patches of manuka scrub too. The river flows over a shallow bed of rock down to a short gorge above Jollie Brook. The gorge is short and narrow with a number of ledge rapids. The rock walls are topped with manuka and beech. The river opens out on reaching Jollie Brook and flows over a bouldery bed with some con- fined sections between rock banks. Quiet pools are frequent. Another short gorge lies above the confluence of the North and South Branches, but there are no rapids here other than shingle shallows. Overall a gentle flowing section of river with open country and short gorges. Easily accessible from the road.

Scenic value: Moderate.

Recreational value. High.

146.2.1 HURUNUI RIVER SOUTH BRANCH

Location: The South Branch of the Hurunui River is much smaller than the North Branch. It flows east from the main divide over a shallow shingle bed. its main tributary is the small North Esk River which originates near the headwaters of the Esk River which flows into the Waimakariri.

River confluence location: NZMSI, S60/761423

Length: 44km.

Recreational use and scenic description: The South Branch of the Hurunui River is quiet flowing over a shallow shingle bed with some rocks and rock banks. The river flows through a dry tussock valley with a great deal of rnatagouri scrub. The North Esk River is smaller still but has beech and other bush on its valley sides. Access is more restricted in that no public road ex- tends up the valley for any distance. Most recreationalists, when in the area, prefer the North Branch, and thus the South Branch has been ignored.

Scenic value: Uninspiring.

Recreational value: Insignificant.

146.3 HURUNUI RIVER MAORI GULLY AND HAWARDEN GORGE

Location: From the confluence of the North and South Branches of the Hurunui, the river moves off to the east through a narrow gorge known as Maori Gully (so named be- cause it was a section of the greenstone route to Westland, and numerous artefacts have been discovered there). The valley opens up and then enters a second gorge, Hawarden Gorge, before flowing onto the Culverden Plains.

Section end location: NZMSI, S61/944460

Length: 25km.

RECREATIONAL USE:

Motor launches: Too shallow and boisterous.

Jet boats: This section contains the famed 'Chutes' in the Hawarden and Maori Gully Gorges which are sought by the more experienced boaters. This section is usable only with a good flow of water

and any decrease in the mean flow will render this very valuable resource useless. Some quiet pools between each rapid are of value for taking things easy before the next rapid - a situation that does not always exist in white water trips. This section of the Hurunui has white water navigable by jet boats, as contrasted with the Rangitata Gorge where the rapids are too boisterous. The nearest high class white water is in the Cromwell Gap on the Clutha and this will soon lie beneath a hydro lake.

Drift boats: Excellent water suitable for the larger drift boats, without too many shallow shingle shoals.

Rafts: Excellent water although sharp-edged rock could be a problem for unprotected rubber inflatables. A steady current to assist the more cumbersome craft. Moderate to high skill required.

Canoes/kayaks. One of the more frequently used 'hard' white water trips in the area and particularly valuable when the river is flowing slightly above normal flows.

Generally considered as Grade 3 water and suitable for the average skilled canoeist but most rapids are portagable and hence the novice is not excluded from using the river. Some canoeists may spend a whole day on the first 2 kilometres below the Seaward Stream 'playing' the rapids.

Pack floating, swimming: Not used to any great extent as the rapids become too boisterous.

Scenic description: From the confluence of the South Branch down to the Seaward Stream on the right bank (4.Skm) the river flows quietly over shingle and stones with some small pressure waves. The river here is flanked by grassland and matagouri scrub. At Seaward Stream the river enters Maori Gully, a low rock gorge with a number of impressive ledge-type rapids. The banks are often littered with loose rock and with the upgrading of the road above the gorge and removal of the manuka and small stunted beech trees, the gorge walls are now badly eroded and loose scree falls into the river. Some silver poplar and willows have been planted to hold the banks and these are an obvious misfit to the natural vegetation in the area and detract somewhat from the rugged nature of the gorge.

The rapids case at Surveyors Stream and easy rapids exist down to the Hawarden Gorge. Rapids in the lower gorge are not so difficult but the gorge walls are more impressive, higher and generally shaded. One particular rapid is a very narrow chute of fast white water. At the Mandamus River confluence it opens out onto braided shingle flats.

Scenic value: Moderate.

Recreational value: High.

146.4 MIDDILE HURUNUI RIVER

Location: From the Mandamus River confluence the Hurunui flows as a braided stream over the Culverden Plains past Bal- moral Forest to the Lowry Peaks Gorge.

Length: 36km.

Recreational use: This portion of the Hurunui is regularly used by all recreational groups although not so much by rafts and pack floaters, probably because of the shallow, braided nature of the river. Jet boaters consider the river up to the foot of the Hawarden Gorge as being straightforward and suitable for the less experienced although a good deal of skill is required if the river is low. There are often problems encountered with debris on the piles of the rail bridge. Canoeists regularly use the river from 'The Peaks' Station (access over private property) and the river is used by clubs for instructional purposes.

There are a number of picnic spots. The most frequented are at the main road bridge, downstream on the right bank, and a very popular campsite upstream of the bridge on the left bank in a grove of willows and pine. The nearby Hurunui Hotel is of historic interest and is a tourist curiosity which adds to the charm of the picnic area.

Scenic description: From the Mandamus River confluence the Hurunui becomes braided, although it maintains a steady cur- rent. Willows line the banks and screen off much of Balmoral Forest and the farmland that flank the river. Gorse and broom scrub are common. The dry Lowry Peaks tend to dominate the downstream vista and add some interest to an otherwise flat and dusty landscape.

Scenic value. Uninspiring.

Recreational value. Intermediate.

146.5 HURUNUI RIVER - LOWRY PEAKS GORGE

Location: Below the Culverden Plains and Balmoral Forest, the Hurunui flows in a shallow gorge south-east through the Lowry Peaks Range and onto a narrow coastal plain, south of Cheviot.

Length: 20km.

Average gradient. 1:230 4.4m/km.

RECREATIONAL USE:

Motor launches: Too shallow.

Jet boats: Boatable but requires above normal flows and is generally too low in summer. The river is narrow, shallow and straightforward boating when there is sufficient flow.

Drift boats, rafts: Used but because of the lack of white water, is considered inferior to the upper river sections.

Canoes/kayaks: An interesting trip, easy and suitable for novice canoeists. Many canoe clubs (four centred in Christ- church) and youth groups (Boys' Brigade and Scouts) use this section of the river for introductory trips to canoeing activities. Many trips launch at Cathill Station rather than use the whole of the gorge as this allows a shorter distance to organise trans- port between launching and exit points.

Pack floating: Not used to any great extent although the river offers a usable and gentle trip.

Swimming: Considerable use at the lower end of the gorge at the main road bridge. A large picnic and barbeque area here is well patronised.

Scenic description: The Lowry Peaks Gorge is a gentle flowing section of river over a shingle bed. There are no dramatic gorge walls; rather, gentle sloping tussock bills flank a narrowly con- fined river bed. Small willows grow along the river banks. There are no rapids but the river is swift flowing. Some pines may be seen on the higher slopes of the hillsides.

Scenic value. Moderate.

Recreational value: High.

146.6 LOWER HURUNUI RIVER

Location: From the foot of the Lowry Peaks Range Gorge and the main road the river flows north-cast to the sea over a wide shingle bed.

Length: 19km.

RECREATIONAL USE:

Motor launches: Generally too shallow to boat above the river mouth area. Smaller craft launch off the beach for a sea trip associated with fishing trips.

Jet boats: Boatable from the river mouth although high flows are needed. Considered to be a gentle and easy trip with some problems from willows at the road bridge.

Drift boats, rafts. Not used greatly because of shallows. Canoes/kayaks: Used, but not to any great extent. Most canoeing is associated with picnics at the main road and at the river mouth and camping area. Few dedicated canoeists bother with this section of the river. No rapids.

Pack floating: Unused.

Swimming: Considerable use at the river mouth area and at the camp site, also at the main road bridge.

Scenic description: A braided river trip over a wide shingle bed, flanked by some clay coastal cliffs and bluffs. Willows are common. There are few rapids. The farmland in this vicinity lies above the banks and bluffs and is not visible from the river for most of this section.

Scenic value: Moderate.

Recreational value. Intermediate.