Wairau Community Panel
Discussion Papers and Resolutions

Wairau Floodplain Management Plan

Members of Community Panel

M G (Michael) Briggs (Ph 572 8333)	Chairman of Panel; Councillor and Chairman of Marlborough District Council Resource Management and Regulatory Committee
J W (Jack) Broughan (Ph 570 5687)	Tuamarina and Northbank areas
A H (Alex) McIntyre (Ph 572 8144)	Upper Wairau (above Waihopai confluence) area
W D (David) Rudd (Ph 572 8794)	Raupara area and Farming interests
P (Phillip) MacDonald (Ph 570 5629)	Lower Wairau area
R G (Rex) Frost (Ph 578 8421)	Fish and Game Council and Recreational interests
A A (Allan) Scott (Ph 572 8943)	Grapegrowers and Upper Opawa River area
E I (Liz) Davidson (Ph 578 3875)	Conservation interests and Blenheim area
E P (Pat) Hammond (Ph 572 8447)	Renwick area
T M (Tom) O'Connor (Ph 570 5498)	Spring Creek area and Fish and Game Council

Project Team

R O (Robin) Carr	Senior Rivers Engineer (Project Leader)
E B (Brin) Williman	Rivers Planning Engineer
R D (Rod) Witte	Senior Strategic Planner

Wairau River Management Plan

Community Panel Discussion Paper No.1

"Maintaining The Current River Patterns"

Introduction

The background to river control works in Marlborough is set out in Chapter 6 of Volume I of "Water and Soil Resources of the Wairau". Para 6.1 shows that from the beginning of pakeha settlement there have been substantial modifications to the river system.

These modifications have changed the natural environment in many ways, for example:

- The location of rivers have been changed by the construction of diversions
- Swamps have been drained
- Floods have been confined - thus raising water levels and impeding drainage
- Vegetation in floodways has been either removed or replaced with different species
- Braided rivers have been confined towards more single thread regimes
- Floodgates impede the passage of migratory fish
- Flows in river channels have been changed, and environmental changes encouraged
- Groundwater recharge has been affected

A fundamental decision, therefore, is whether or not the current river system with its modifications is generally beneficial or disadvantageous to the dwellers on the plains in the widest terms;

e.g.
- socially
- environmentally
- physically

to the extent that the river control systems must be maintained at levels similar to the present level.

All other decisions that may be made have a relativity to the view of fundamental desirability of the system as it stands, and the acceptance or denial that the modification of the environment is so far committed that the options for restoration to a 'natural' status are very limited.

To be noted is that the natural river system would have changed naturally over the last 140 years, through in a less dramatic fashion than the modifications fashioned by man.

N.B. This paper refers specifically to the river floodplain below the Waihopai confluence.

The Issues in More Detail

a) The location of rivers and River flow regime.

The location of all the watercourses on the Wairau Floodplain have been considerably modified by diversions. Those diversions have created new channels. The diversions have also meant that the original natural channels are now carrying a different regime of flows, including flood flows, than they did in the past.

The Upper Opawa/Rose's Overflow is an example of different flow regime. The Opawa originally carried Wairau water, typically one third the flow of the Wairau. Rose's Overflow is a man made channel constructed to divert Upper Opawa flows on a shorter path to the Wairau estuary. Now the Upper Opawa/Roses carries no Wairau water, but it does carry all flow from the Omaka and Fairhall, and a steady low flow diversion from the Waihopai via Gibsons Creek.

With todays intensive development of the floodplain it would be a mammoth exercise to attempt to restore original channel locations and flow regimes. It must be obvious that there are no options left in this respect.

b) Draining of Swamps & Wetlands

In environmental and to some extent hydrological terms, the draining or swamps has been of mixed value, and has destroyed important habitat for wildlife. Much of the plains was originally in swamp and wetland and only a few remain - for example Tuamarina, Pukaka and the Wairau lagoons, and some of the fault related swamps.

The opportunities for restoration are limited. Only the Tuamarina is probably an option for active restoration, but there may well be disadvantages of water meadows being created where reasonable pasture now exists.

Apart from active measures to avoid further loss of swamp land, options are few.

c) i) Floods have been confined

The stopbanking system contains floods within narrow fairways. The flood level is raised a considerable height above surrounding land - sometimes for extensive periods. Natural drainage may be impeded, necessitating pumped drainage. There seems to be nothing that can be done to change this situation without a total change of policy and demolition of banks - an unthinkable proposition.

ii) Floodgates impede the passage of migratory fish

This follows from the above. It is a fact that high levels in the main watercourses necessitate the location of floodgates on drainage outfalls. The purpose is essentially to prevent back flow of flood waters.

However, in low lying areas the gates have a dual function of preventing tidal variations of natural river levels being transmitted back up the drains. This has had the effect of allowing cultivation of land at or near sea level, both from the point of view of actual water level as well as saline intrusion in the drains.

The Department of Conservation would wish floodgates to be held open at certain times of the year (whitebait!!), but this is incompatible with current farming practice.

It could be considered that it is expecting too much to farm high value crops in very low lying areas, but to return to natural drainage in all but flood situations would require a serious political decision, as well as posing operational problems.

It is a possible option that this group will have to address.

d) Vegetation in floodways has been either removed or replaced with different species

The confinement of floods within floodways is achieved by containing the water between stopbanks. The height of the banks is governed by a number of factors, one being the ease in which water can pass down the floodway. Heavy growth in the floodway is incompatible with this requirement.

Trees are required to prevent bank and berm erosion. They are particularly required where river velocities are higher, for example the Wairau river above Tuamarina. Willow trees have an advantage in their strong root systems and quick growth from cuttings. However, excessive growth, particularly where it overhangs far into the main channel, will reduce the flow capacity.

In a narrower river, like the lower Wairau, or the lower Opawa, bushy, overhanging willow can cause serious reduction in flow capacity, with serious implications for overtopping of banks.

It is obvious that management of growth is a very important factor in river management. Unfortunately it is not always one in which we are in complete agreement with DOC and the Fish & Game Council. These organisations view overhanging willow as very beneficial for providing cover for fish and wildlife. In general, where bank erosion is not a threat a compromise can be reached with heavy willow being removed and replaced by spaced planting of more acceptable species. Some willow will have to be left on the outside curve of beds where it offers bank protection.

However, a basic philosophy of river management would seem to be that the control of growth in the river channels and flood berms is essential and will take priority - although consideration can be given to assisting with environmental concerns when it is possible without comprising the flood protection standard.

Once again options are very limited.

e) Braided Rivers

Training the braided Wairau to single thread channel was an original river control concept. A single thread channel has significantly different environmental features than the natural braided bed. The wetted surface area at average flows is generally much less - so the animal population of that environment is reduced. On the other hand, the tendency to single thread creates deeper pools and a more consistent flow - thus aiding the passage of migratory fish species e.g. salmon and whitebait.

Although the single thread concept in large braided rivers has been much less effective as a valid river control measure than originally thought, there is no doubt that the control system adopted of heavily rocked control lines had encouraged the deep channel and riffle regime. To retain this pattern, it is necessary from time to time to extend rock lines and to carry out diversions in the river bed.

There seems to be no possible options other than to retain the existing use of rock lined control structures. The alternative of greatly increasing the floodway width with dropping back and reconstruction of stopbanks is no longer feasible, bearing in mind land value and the costs of relocating stopbanks and bank protection works.

f) Flows in channels have been changed and environmental and physical changes encouraged

This is largely covered in (a) and (e) above. However, there are certain areas where extreme changes have been created by river control works. In particular the Opawa Loop has been cut off from both the Opawa and Taylor to the extent that it has no future in its present state and does not carry floodwater. The options open are really to recreate the channel as a major waterway by removing the control gates and raising the stopbanks - or to retain the present controls and reduce the channel width by about two thirds. The difficulty of putting stopbanks through the Riversdale area is self apparent, so once again this options is most unlikely. The main option for consideration is to what extent its environmental attractiveness should be improved.

g) Groundwater recharge has been affected

The closing of the Opawa breach without doubt had a major effect on aquifer recharge. Up to the present time, the groundwater use has been insufficient to put pressure on the resource - except in limited areas. However, this may not continue and there may become a need to compensate for the closing of the Opawa by some artificial means of aquifer recharge. Obviously, opening the breach is impractical as it would have serious implications on Blenheim and on rural areas. Thus an artificial recharge using intake controls would probably be the only option.

Conclusion

Over the 100 years or so since river works were commenced on the Wairau Floodplain, vast amounts of money have been spent to create the present river system for the prime purpose of flood control. Since the 1950's alone, over $80 million in present terms has been spent - mostly with a high degree of success in the prevention of catastrophic flooding. There is no doubt that in some cases there are environmental and physical effects that are less than desirable. However, the overwhelming social advantages of the present protection standards would seem to heavily outweigh the disadvantages.

The ultimate conclusion must thus be that while every effort may be made to alleviate any environmental problems that may be, or may become evident, the fundamental object to be achieved is that the present high standard be maintained and given a priority over all other concerns.

Recommendation

That the Community Panel offer its support for maintaining the presently highly modified river system as priority over all other considerations, while acknowledging the need to advance the cause of environmental concerns whenever possible.

The community panel met on 4 December 1992, discussed and confirmed this recommendation.

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Wairau Floodplain Management Plan

Community Panel Discussion Paper No. 2

"Desired Standard of In Channel River Works"

1. The Wairau River Channel is dynamic

The Wairau River and its tributaries across the Wairau floodplain are dynamic. That is the rivers form and move the river channels in which they flow. The river bed material (indeed the whole floodplains) has been deposited by the river. There is a relationship between the size of the self formed river channel and the size of flood flow it carries. Typically a river channel on a floodplain is naturally of a size that can just contain a flood that occurs on average once a year. (This varies depending on supply of sediment from upstream and the degree of vegetation in the river channel). Flood waters then spread across the surrounding land.

2. Stopbanking required to prevent flooding

Stopbanking is therefore required to prevent the spread of floodwaters from the river channel. A fundamental question is how big a flood should be contained within the stopbanking system.

Historically stopbanks on the Wairau were constructed just a bit higher than the last big flood, with little knowledge of actual flood sizes. This approach has an advantage of political expediency; but it does not address the following matters:

(a) Flood levels (and the stopbank heights) for similar floods are affected by channel changes - especially diversions or stopbanking upstream or on the opposite side of the river, or gravel deposition.

(b) Intensive land development with high capital investment, requires a clearer identification of risk.

The alternative method of determining stopbank heights is a detailed study of the size of floods likely to occur and computer aided hydraulic analysis of the waterway capacity required for such a flood flow. This approach is considered more appropriate for todays planning of river works on the Wairau River and tributaries on its floodplain.

3. Size of design flood

The question arises as to what size flood should the stopbanked river systems be designed to cope with; (then secondly what further measures should be adopted to reduce damage from a flood in excess of this "design" flood). This size of flood can be described in terms of how commonly it occurs.

e.g. a flood can be described as having a 100 year recurrence interval. This means on average it will occur once very 100 years. More meaningfully it can be expressed as having a 10% chance of occurring within the next 10 years.

Theoretically a cost benefit study could be done to assess the economic size of a stopbank system. This requires a major study and the assumptions required in such a study make its accuracy uncertain.

A more pragmatic approach is to examine:

(a) What standards are adopted in similar situations throughout New Zealand; and

(b) What the ratepayers of the community can afford.

For urban areas with major rivers a flood with a 10% chance of occurring in the next 10 years (100 year standard) is typically used in New Zealand, though some cities are considering even larger floods, with a lower chance of occurring.

For rural areas a flood with a 20% chance of occurring in the next 10 years (50 year standard) is typically used, though some areas are considering lesser floods.

The Wairau floodplain has the urban areas of Blenheim, Tuamarina, Spring Creek and Renwick at risk from flooding from the Wairau, Taylor, Opawa, Omaka and Fairhall. Furthermore, the rural land of the Wairau floodplain is also rapidly intensifying with viticultural, horticultural and lifestyle block development. The desirable design flood size for these rivers should therefore be for a flood with a 10% chance of occurring in the next ten years (a "100 year flood").

Some reaches of the Wairau and its tributaries have a current standard of protection of approximately a 30% chance of failure in the next ten years (a "30 year flood"). This is unacceptably low in terms of national standards.

The cost of carrying out works to the desired standard is a factor that needs to be taken into account, particularly in the absence of government subsidy.

What the ratepayers of the community can afford must be considered. The upgrading works required could and should be spread over several years. A further option is that if the normally accepted standards cannot be economically reached in some areas of the floodplain then planning measures be adopted to limit development in such areas.

4. Recommendations

(a) That the Wairau River and major tributary channels on the floodplain be designed as far as practical to a uniform high standard

(b) That the desired standard to be aimed for is that with a 10% chance of occurring in the next 10 years ("a 100 year flood")

(c) That the programme of works to achieve this standard be set at what the community can afford, and that it is accepted that this is likely to be spread over several years

(d) That if there are areas where this standard cannot be economically reached then planning controls will be required.

The community panel met and discussed this on 4 December 1992 and confirmed these recommendations.

Wairau River Management Plan

Community Panel Discussion Paper No. 3

"Changing the Wairau Valley River Control Scheme Boundaries"

1. Background

The thorny question with regard to any public work is what works should be done and who should pay. This is particularly true for river control works, and very difficult to resolve.

An even more basic question is what works should be done by private individuals and what works should be carried out by a public body.

Consider, for example, a landowner beside a river. If he constructs a stopbank on his river frontage he may still just as likely be flooded by the river flooding over his neighbours unstopbanked property. To protect himself he needs to band together with his neighbours so that continuous stopbank works can be put up to protect them all. These community river control works usually require the setting up of a public body to carry them out.

Sometimes, historically, a public body was formed representing landowners on one bank of the river. The stopbanks then built on one side of the river increased the flooding and damage on the other side of the river. Bitter legal battles then ensued between river boards representing opposing sides of the river.

This happened on the Wairau Floodplain. The attached plan shows the five different river and drainage board boundaries in 1917 when a Royal Commission was convened to resolve their disputes and grievances.

Dispute was particularly fierce between the Lower Wairau River Board who wished to block off the Opawa channel at Conders leading towards Blenheim, and the Spring Creek River Board that would receive extra flood water down the lower Wairau as a result. The Tuamarina River Board, the Pukaka River and Drainage Board, and the Maori Drainage Board were also affected by increased flow down the main Wairau. On the Opawa River each board raised progressively higher banks on their "own" side of the river.

The Royal Commission hearing was influential in achieving the amalgamation of these river boards into a single Wairau River Board in 1921. This single river board covering the area of the previous boards was responsible for carrying out works on all the rivers of the floodplain.

The amalgamation was not the complete answer, especially with regard to dealing with sediment coming from the hills to choke the waterways. The Wither Hills were extremely erosive and the south of Blenheim was under threat from uncontrolled sediment and rainfall runoff from this source. The Wairau river bed was also perceived to be building up in an alarming manner, and soil conservation works in the upper catchment were seen as very desirable.

The Soil Conservation and River Control Act 1941 was a major government initiative providing for the setting up of Catchment Boards which covered the entire area of the river catchment. The government provided generous subsidies to encourage Catchment Boards to adopt a "Source to the Sea" approach in dealing with river control problems.

2. Whole Catchment Control Schemes

A whole catchment control scheme involves carrying out soil conservation works in the rivers sources in the hills, stabilisation works in tributary streams through to river control stopbanking and other works on the floodplain to its outlet into the sea. The 1960 Wairau Valley Scheme (and subsequent follow up works) was such a "source to the sea" scheme. The area over which works were carried out (and paid for) was the whole catchment including all tributaries. This represented a considerable expansion on the earlier Wairau River Board area that only covered the Wairau Floodplain below Waihopai.

This whole catchment approach was made feasible by the generous government subsidy money that averaged nearly 3:1. These government subsidy moneys are now no longer available. It is timely to review whether a whole catchment scheme is still practical; or if the old Wairau River Board boundaries are more appropriate; or some other scheme boundary or various scheme and various scheme boundaries are appropriate.

3. Blenheim and the Interlinked Waterways of the Wairau Floodplain

On the Wairau Floodplain downstream of the Waihopai confluence the current river pattern has been highly modified by previous River and Catchment Boards works. None of the waterways are carrying their original "natural" flow regimes. It was discussed and agreed in Community Panel Discussion Paper No. 1 that this current modification pattern of waterways had to be accepted.

A common view expressed by Blenheim residents is that the river control works that protect the town have been completed long ago, and they find difficulty in relating the continuing expense on the Omaka, Opawa and Wairau Rivers, to their situation.

Blenheim - or Beavertown as it was known in earlier days, was at the confluence of a number of river systems - Taylor, Fairhall, Omaka and significantly the Opawa that was a secondary channel of the Wairau.

The water from all of those channels, together with water from the Wither Hills converged on Blenheim in times of storm. Early surveyors had to huddle like beavers above the floodwaters.

To bypass the town, the original channels were diverted. Fairhall and Omaka water was diverted north into the Upper Opawa/Rose's Overflow, and the secondary channel of the Wairau - the Opawa - was blocked at Conders.

All of these activities naturally had reactions, in that areas that had previously coped with the natural situation were confronted with 'foreign' water flows that adversely affected their situation and aggravated flooding.

The Authorities of the day, were faced with legal battles to justify the protection of Blenheim, apparently at the expense of such locations as Tuamarina, Renwick, Grovetown and the lower Wairau.

It was accepted - this acceptance forms the basis of the rating principle - that Blenheim could not expect to carry out works to protect itself at the expense of other areas. It was also accepted that the protection of the other areas should be carried out concurrently with or even ahead of, the work to protect Blenheim.

This principle holds as firmly today as when it was first accepted and promulgated by the 1917 Royal Commission - and as stated forms the basis of the means of raising funds to consolidate and improve flood protection for Blenheim.

Fundamentally, the standard for all river works on the Wairau, derive from Conders Bend, and the standard adopted there to protect Blenheim. This sets the standard for the floodplain and a commitment on Blenheim ratepayers.

What is not so evident is that the works on the Taylor River through Blenheim are able to be less obtrusive because Fairhall and Omaka water has been diverted to the north of town. The requirements to maintain river works on those river systems are therefore - in the same way as the Wairau - a commitment of the Blenheim ratepayers. The fact that the rivers were diverted many years ago is not an issue, as the river systems take many years to adjust and the Council must continue upgrading and maintaining the system.

Present legislation would not allow the type of works that have taken place without legal physical safeguards. It is significant and perhaps a little humbling, to see that past administrations accepted their responsibilities without the weight of the Resource Management Act to encourage them, and there should be no doubt that those responsibilities still exist.

Improving and maintaining this jigsaw of interlinked modified waterways on the floodplain carries with it the responsibility that all river control work on these Wairau floodplain waterways should be planned, promoted and funded as one scheme. If this was not done there would be valid objections under the Resource Management Act to such a floodplain management plan.

Without Blenheim ratepayer input, the river system would fail. Blenheim may try to dictate that a lower rate intake should be struck and only used on the Taylor and the Wairau at Conders. Any such move would face strong legal challenge, but if this was achieved, the remainder of the system would collapse. The results of this would without doubt lead to major claims against Council and enforced reinstatement of the system to an equitable standard.

There are some more minor waterways on the margins of the floodplain that are less clearly interlinked. The Omaka River (south of S.H.6), the Riverlands floodway and its tributaries from the Wither Hills Streams, the narrow floodplain on the north bank of the Wairau and the smaller streams are waterways on the margins that could possibly be considered as separate scheme areas and funded separately.

Generally they were not within the former Wairau River Board area. They are waterways where a high standard of flood control is desirable and could sensibly be included in a single overall Wairau floodplain area.

4. Wairau River above Waihopai Confluence

The Marlborough Catchment Board has spent over $10 million dollars (in 1992 terms) at an average rate of $300,000 per year for over 30 years on the Wairau River above the Waihopai confluence.

The work was justified in the 1960 scheme and again when further works were approved in 1974 mainly because of the direct benefit to the adjacent farmland. There was also a postulated benefit of reducing gravel supply and thus channel build up in the lower river and floodplain downstream.

The river resurvey information now available indicates that the river bed from Waihopai confluence nearly to Wairau Valley township has remained at much the same level with no indication that river control works in the area are influencing aggradation or degradation of the bed.

The Wairau River is such a wide river that whatever bank works are put in place there are large expanses of gravel bed to supply bedload to the river. Thus there is little evidence to support the contention that river works are useful in reducing gravel supply to the Wairau River downstream. This is supported by observations on other NZ gravel bed rivers.

The Wairau riverbed on the Wairau Floodplain is aggrading (building up) between Tuamarina and Giffords Road, but it is eroding and deepening between Renwick bridge and Waihopai confluence. Thus, even if river control works up stream have been successful in a reducing gravel supply to the floodplain section of the river, the river has adjusted to this by eroding its own bed in the Conders area and still depositing and building up the river channel in the important Tuamarina to Giffords Road area.

Thus, the aggradation problem in the Tuamarina-Giffords Road area may well be much the same irrespective of whether works in the Wairau above Waihopai are having any effect on gravel supply (which is doubtful).

The river control works upstream of the Waihopai confluence at present have no clear benefit for those living downstream on the Wairau floodplain. River work done in this area affect a different community of interest. These river works could be a separate river control scheme planned, promoted and funded quite separately from the main Wairau floodplain scheme. The economies of carrying out river works in the area would then be more readily be assessed on its merits.

Indeed, there could be considered to be 12 separate river schemes, one for each of the separate open ended rock lined banks. Each bank actually protects a distinct area involving only a few, and sometimes only one landowner. In this scenario, the landowners receiving the benefit from the work would have the major say on what works they wanted carried out, and a major responsibility for funding the work.

The Council could and perhaps should still make a financial contribution to the river control works there River works carried out here in the past have encouraged landowners to develop and in some cases subdivide the land. Landowners therefore have more to lose now if the river works are not maintained. The Council contribution may have to be quite substantial if it wished to see river works done in the area due to the high cost of works and the few landowners benefiting.

5. Other Wairau Tributaries

Considerable expenditure has also taken place on the many tributaries of the Wairau, eg the Tuamarina, Waikakaho, Are Are, Bartletts, Mill Stream, Waihopai, Hillersden, Wye etc.

The work done has mainly been channel clearing and bank stabilisation. Similar arguments regarding the effect of work in reducing sediment supply to the Wairau floodplain supply to these rivers as to the Wairau above Waihopai Confluence. Again there is little or no benefit to ratepayers living on the main Wairau floodplain.

The work on these tributaries is further complicated by being poorly defined as what work is to be done to achieve what standard of river control.

The standard achieved and the expenditure committed in some cases been in excess of the 1960 official scheme intentions. The expenditure has also been considerably in excess of rating money from the areas.

As for the Wairau above Waihopai these different tributaries could have their own river districts and schemes set up in which the works were planned and funded separately, with, as may be deemed appropriate Council financial support.

6. Soil Conservation Works

The last step of a "sea to the source" scheme is the Soil Conservation work in the upper catchment. Soil Conservation works to reduce sediment input to the river system have been carried out on the Northbank Streams, Upper Wairau, Wye, Waihopai and Wither Hills.

The Soil Conservation works on the Wither Hills clearly have a direct and valuable benefit for the waterways at the base of the hills directly affect the intensive development of Blenheim. Should the waterways at the base of the hills be suddenly filled and blocked by sediment eroded from the hills in a major storm, considerable damage would result immediately to adjacent houses. The Council clearly needs to maintain and perhaps improve existing soil conservation works on the Wither Hills. This could be considered as part of the Wairau floodplain area and funded from that rating account. Council own and maintain this land.

The effectiveness of doing Soil Conservation works in other parts of the catchment is much less clear. The work that was practical to be done has been done, especially on the Northbank. Much further work could be carried out in the Waihopai which is a major sediment source, especially of the suspended sediments. (It is such fine sediment size that is silting up the lower Wairau). The value and effectiveness of carrying out such soil conservation in the rugged Waihopai catchment is however, uncertain. The arguments regarding the degree to which sediment supply actually affects the floodplain discussed above apply to a large degree for soil conservation works also. Works or land management policies may be needed in the future to control fine sediment erosion.

Council has no plans to carry out further such soil conservation work in the near future. There is no longer a "source to the sea" whole catchment scheme, at present.

7. Drainage Works

Significant expenditure is also carried out on the Wairau floodplain on drainage works, generally on the flat lying land to the east of Blenheim. Currently this work is planned and funded together with river control works as part of the Wairau Valley Scheme. Should this also remain within the same single scheme area as river control ? Or should even within the floodplain area separate drainage schemes be defined ?

A major difficulty is drawing a line between "flood control" works and "drainage" works. For example, works done on the Wairau bar mouth reduce water level in the lower Wairau and lower Opawa river which is to the benefit of both reducing flood levels and considerably improving drainage. Another example is that stopbanks reduce potential for flooding, but make "drainage" more expensive as the water has to be pumped up and over high stopbanks.

It is not a simple problem, and it will be addressed in a separate discussion paper on drainage.

8. Monitoring

Much of this paper has been based on data the Council has monitored for river and catchment behaviour over the whole catchment. Further monitoring will continue to be required to areas if changes occur in the future, which may indicate that river control and soil conservation works are required in the future outside of the Wairau floodplain. Indeed, such monitoring is a responsibility for the Council as part of its Regional Council duties under the Resource Management Act.

The monitoring is required not only of riverbed surveys on the floodplain, but also upstream surveys and indeed whole catchment condition monitoring. The funding of this monitoring work could sensibly be from general Council rates. The responsibility for carrying out monitoring and its funding is a separate issue from funding of works over a works rating area.

9. Scheme Administration

A single scheme is administratively easier in that it requires less paper work than several schemes each with their own account system. It is also easier to programme works if they can be completed exclusively in one area in one year, and for a different sector of the rating district another year.

A single large scheme on the other hand, has the difficulty that staff and Council members are entrusted the responsibility for assigning priorities for the various works. It is difficult to assess priorities for different types of jobs in different areas, and it can easily be subject to political involvement.

10. Summary

River control works by their nature are public works.

A fundamental question is defining the district over which a scheme be planned, promoted and funded.

Originally a patchwork of several river and drainage boards districts covered the majority of the Wairau floodplain.

At the time each district represented a perceived community of interest district over which a "user pays" philosophy could be adopted.

These different districts had conflicting objectives and considerable dissension arose as each river board strove to achieve these conflicting objectives. Works carried out at Conders to protect Blenheim detrimentally affected other parts of Wairau floodplain.

Works carried out on the Omaka, Fairhall and Opawa also generally benefited Blenheim to the detriment of others.

The 1917 Royal Commission was influential in amalgamating the districts into a single Wairau River Board district in 1921, and requiring that river works to protect Blenheim be balanced by compensating works on the Wairau and Opawa.

In 1960 the Wairau Valley Scheme which covered the whole catchment was promoted by the specially formed Marlborough Catchment Board and approved for generous subsidy by Government based on its 1941 Soil Conservation and River Control Act.

Works on this scheme, and follow up schemes, all with generous government subsidy continued until June 1991.

In determining a river management plan outlining the further required river control works the question of desirable scheme boundary or scheme boundaries needs to be addressed.

Under the 1991 Resource Management Act there will be conflict and dispute in the resource consent procedure if the Wairau Floodplain is divided into several districts representing perceived user pay groups.

There are options for waterways on the fringes of the Wairau Floodplain to be included or excluded from a Wairau Floodplain Scheme.

For the Wairau above Waihopai confluence, and the various tributaries, separate districts and schemes could be set up.

Although any district could be expected to fund the works on its own area through a works rating system, the Council could also contribute from general rates as recognition that land development had been encouraged by previous river works.

11. Options

That river control works in the Wairau Catchment be planned, promoted and funded :

(a) As a single whole catchment district.

(b) As several districts, the most important of which would be the Wairau Floodplain below the Waihopai Confluence. This would stretch from the line of the base of the hills across the floodplain to a similar line of the base of the foothills on the other side and also including the Wither Hills. A possible boundary is shown on the attached plan. Various mini districts and their various schemes could be set up on the tributaries as feasible and requested by the affected communities.

(c) As for (b), but a less generous definition of the Wairau floodplain be taken by excluding fringe floodplain river works such as Wither Hills Streams, Omaka, Northbank of the Wairau, etc and these areas also having their own separate districts.

(d) As that several river districts and schemes to be established over the Wairau floodplain to reflect perceived user pay boundaries which could be similar to the 1917 river board district boundaries. Again mini schemes on the various tributaries.

The community panel met and discussed this paper on 22 January 1993 and recommended a combination of options (a) and (b)

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WAIRAU FLOODPLAIN RIVER AND DRAINAGE BOARD DISTRICTS

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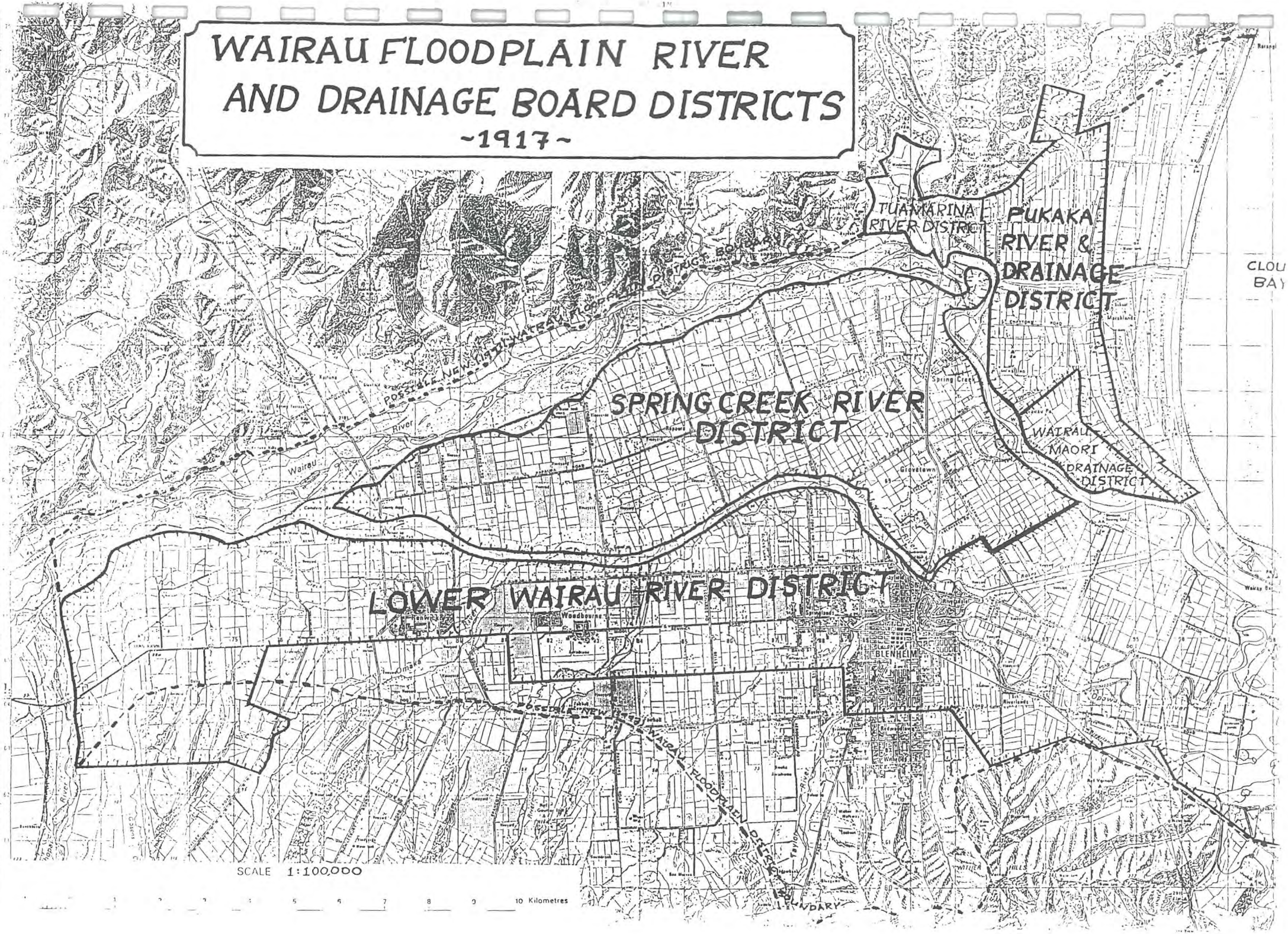

Wairau River Management Plan

Community Panel Discussion Paper No. 4

"Controls on Floodway Land"

1. Introduction

On the Wairau Floodplain (ie, the flood plain below the Waihopai confluence) there are large areas of "river" land that are contained within the stopbanked system. Much of the land is obviously active river channel. This is where regular water flow prevents vegetation growth and is recognisably "riverbed".

There are also significant areas of land between this active channel and the stopbanks. These are the flood berms which only carry floodwater in the larger floods. The waterway capacity of the flood berms is vital for major floods. The floodway berms also provide room for stopbank protection works in the form of groynes and tree planting. However, the land is also capable of pastoral, cropping, forestry, recreational or other uses.

These other uses of the flood berms should not be allowed to compromise the primary purpose of the flood berms to carry flood waters, and/or provide an area for stopbank protection works. Controls are required on this land for this reason. A major question is what planning controls should be used on flood berm land.

The land is sometimes in private ownership, sometimes in Council freehold ownership, and large areas of the Wairau are Crown land vested in the Council for river control purposes.

Planning controls are clearly required on privately owned floodway land. Clear policy statements are also required for flood berm land owned by the Council, particularly now that the Council is a unitary authority that owns a variety of reserves for a variety of purposes.

The rivers and river reaches for which policies and controls are required for floodway land include :
Wairau diversion; Lower Wairau; Wairau (Tuamarina to Waihopai); lower Opawa; Taylor; Upper Opawa; Spring Creek; Rose's Outfall; Sutherlands Stream; Fairhall diversion; Pukaka; Omaka; Tuamarina.

2. Allowable Land Uses on Floodways

The operative district scheme zones most, but not all, of the flood berm lands as a floodway zone. The Ordinances for such floodway zones indicate that farming, recreation, forestry and gravel extraction are permitted uses in this zone subject to Marlborough Catchment Board Bylaws.

The Marlborough Catchment Board and its successor the Nelson-Marlborough Regional Council had some policies regarding floodway land. Such policies however, were neither formal public policies nor comprehensive in scope.

The desirable criteria for flood berm land vary depending on the river reach, but range as follows in order of decreasing controls:

(i) Flood berms are of Vital Importance to River Capacity.

Flood berms to be as far as possible short grass; pastoral use only of the land, scrubby weed such as gorse and broom is unacceptable and even cropping such as sweet corn or wheat is undesirable. Land carefully shaped to maximise hydraulic efficiency.

(ii) Normal Flood Berm Situation.

A limited degree of tree planting acceptable, but not forestry plantations or orchards or extensive grape planting. Significant areas of river control tree planting of willow and poplar required for preventing bank erosion. Stock controlled to prevent goats or cattle which damage river control tree planting or stopbanks. No banking work permitted that would obstruct floodway.

(iii) Flood Berms of Little Importance to River.

Little or no controls, except prohibition of inhabited buildings.

To be noted in case (i) and to some degree case (ii), is that these criteria significantly constrain the land use. The land may have to purchased by the Council so as to achieve its river control aims, and/or to be fair to the private landowners.

3. Secondary Use of Flood Berms

Where Council owns or manages flood berm land for river control purposes a secondary use of the land is usually acceptable.

The secondary use may be :

(a) Lease the land to adjacent farmers for farming purposes.

(b) Lucerne or grass growing for hay production and sale.

(c) Commercial forestry, or protection/production forestry.

(d) Public access for recreation.

(e) Provide facilities to promote recreational use.

The current review of the river systems includes examining the river control requirement of flood berm lands for various river reaches. Once the river control requirements are specified the allowable secondary berm land use can be determined.

Clearly there are conflicting options for this secondary berm land use. Leasing of land to adjacent farmers can conflict with public access to the land for recreational purposes.

How much land should be set aside for recreational and public access purposes ? An advantage of being a unitary authority is that the planning and management of river recreational reserve land can be co-ordinated with the other recreational reserve responsibilities of the Council.

Recreational use of Council owned berm land could be promoted more actively in urban areas, and at bridge sites where the public can easily reach river areas.

It is important to be recognised that the river control and flood management requirements of the flood berm land remain paramount.

4. Specific Examples

4.1 Wairau Diversion

The Council owns all land within the Wairau Diversion. Half the width is active channel, half is flood berm. The majority of the flood berm land is leased to adjacent farmers for pastoral sheep farming. This maintains it as a hydraulically efficient floodway, which is desirable as the Diversion is of lower flow capacity than required.

Public use of the left bank is permitted downstream of Rarangi Bridge to the Diversion mouth, and is particularly used by whitebaiters and other fisherman. Recreational use of this area could be more actively supported particularly for this reach of flood berm downstream of Rarangi bridge. The floodway now exceeds required capacity and the flood berm is seldom flooded.

4.2 Wairau-Tuamarina to Waihopai Confluence

Recent studies are showing that this reach of river is not up to adequate flood flow capacity. The flood berms are not carrying the proportion of flood flows that would be desirable. A contributory reason for this is that river training works in the form of high rock lined training banks block parts of the flood berm and thus prevent its use.

These rock lined training banks are required to direct the main channel away from stopbanks. However this training job could equally effectively be carried out by low rock lined banks backed up with a buffer of willow trees.

Often the flood berms that are protected by full height training banks are in private ownership.

These full height training banks could be lowered in height and backed up with willow planting. Indeed the whole of the flood berm land of the floodway needs to be managed in a considered fashion with a blend of willow trees to prevent bank erosion, and open pasture to maximise flow capacity, and minimal banking inside the stopbanks.

Such management would conflict with the farming operations of the privately owned land. This privately owned land may therefore need to be purchased to enable the work to go ahead. The great majority of the flood berm land is already Crown land managed by the Council.

Recreational use of the river in the form of swimming, picnicking and fishing has been allowed. However, public use in the form of semi permanent camping has caused problem in the past. Clear public policies on such public activities are desirable.

4.3 Lower Wairau

Apart from at Morrin's Hollow between Ferry Road bridge and Tuamarina, the flood berm land does not carry a large proportion of the flow. Fewer controls are therefore required on its land use. Because the flood berm land is now less often flooded, quite intensive farming has been carried out in places. Usually the stopbanks are not under threat from erosion in this much flatter graded reach of river and less protection works are needed to protect the stopbanks.

(These comments apply only to the flood berms. There is concern that thick willow growth on the main channel banks is impending main channel flow, and that the main channel is also silting up badly.)

4.4 Taylor

The Taylor River through the town centre is not up to adequate capacity. The maintenance of the river berms by clear cut grass mowing is appropriate to maximise waterway capacity and provide a pleasant recreational facility.

Upstream of upper High Street bridge the floodway is considerably in excess of waterway requirements, especially upstream of Burleigh Bridge where gravel extraction has lowered the river bed by approximately three metres. Recreational use of this Council owned land could probably be encouraged by provision of specific facilities.

4.5 Lower Opawa

Flood levels on the Taylor River through Blenheim are critically affected by the waterway efficiency of the lower Opawa floodway downstream. The flood berms of the lower Opawa are extensive, but they are not being utilised effectively by flood flows. A broad low bank flanks the main channel and cuts off the flood berm from the main river channel. Flood levels in the main river channel can be very high while the flood berms are not being used.

This broad low bank has been naturally formed by historical Wairau sourced floodwaters spilling out of the lower Opawa main channel and depositing silt on the berms. The situation has been made worse by thick growth of willow trees and perhaps these low banks being pushed up by riparian landowners for farming operations.

Selective knocking down of these broad low banks, reshaping of the flood berms, and removal of many of the willow and other trees would considerably improve the river waterway capacity. This would lower flood levels through Blenheim. The flood berms should be then maintained in short grass. The extent of this work would be from Blenheim to half way to Vernon lagoons.

Such works may conflict with current farming operations on this privately owned land. Significant compensation may have to be paid to the land owner, or the land may have to be purchased. Following works, it could be used by the landowners under defined conditions.

4.6 Upper Opawa

The upper Opawa is relatively unusual in that over three quarters of major flood flows are carried by the flood berms and only a small proportion by the main channel. This is a

function of large but rare floods in this river. Extensive tree planting, orchards, grape plantation or even thick growth of scrub or weed trees have the potential to reduce its capacity to less than adequate. While small areas are acceptable, it is **not** practical to selectively permit some areas in the floodway to be planted up. There has to be a general prohibition. The best use of this land is for pastoral use. As much of the adjacent land is being developed into grapes often the landowners are not interested in grazing river land in the floodway, and thick growth of scrub and tree weeds has occurred. The Council has bought such land in the past so as to ensure it is maintained in a short grass condition. This policy should continue.

4.7 Sutherland Stream

Council owns a buffer of land flanking the urban Sutherlands Stream. This has been considered as a recreation reserve, although the flood berm land also serves a useful river control purpose. Clearer policies are desirable on management of this land, so that recreational uses does not conflict with river control requirements.

4.8 Roses Overflow, Fairhall Diversion, Pukaka, Spring Creek

All these floodways have plenty of waterway capacity, and as they are relatively flat graded need no tree planting for bank protection purposes. The best use of the land is pastoral and this is currently occurring. Few controls are needed.

4.9 Other

Some rivers, notably the Omaka and Wither Hills Stream do not have their floodways zoned as such in the district scheme. Others, eg, the Upper Opawa, are not accurately recorded in the district scheme. This needs tidying up.

5. Summary

Flood berm land within the stopbanks is an integral part of the river system and requires controls to prevent other land uses compromising its river control function. Planning controls through zoning and zoning ordinances are used to achieve this.

Secondary use of the flood berm is acceptable as long as it does not compromise river control requirements.

Different zoning ordinances should be used for various river reaches to reflect the varying importance of the river berm for flood control purposes from river to river.

The degree of limitation imposed by such planning ordinances and river control works will in places seriously conflict with the landowners expectation of use of the land, and may result in considerable compliance difficulties and failure of river control works. Alternatively, resolution could be obtained by Council purchasing the land.

Much of the flood berm land is already in Council ownership, for this very reason.

Alternatives for secondary land uses on Council land may be commercial forestry, leasing for farming, or public recreational access and use.

Commercial land use and public access or recreational use may conflict at times. (This only applies to stopbanked rivers, which by definition, have a clearly defined floodway.)

6. Options

(i) The river management plan will have recommended floodway zones and planning ordinances to control land use in floodways. Options are

(a) All land within floodways should be purchased by the Council.

(b) Planning controls should be relied on entirely in the floodway and Council should sell its existing floodway holdings.

(c) Planning controls should be relied on predominantly to control land use in the floodway, and no further land be purchased.

(d) Where and when proposed river controls works and zoning ordinances seriously conflict with desired private ownership use, further land should be purchased by the Council, otherwise planning controls be relied on.

(ii) Where council owns land in the floodways, options are :

(a) To gain as much revenue as possible by commercial leasing or direct use of the land.

(b) To promote public access to and recreational use of this land as a paramount policy, and in some areas provide recreational facilities.

(c) To have a blend of commercial leasing of some river land, and recreational use of other land. Recreational use being the particularly favoured use for town waterways such as the Taylor and Opawa.

The Community Panel met and discussed this paper on 20 March 1993. They recommended option 6(i)(d) and recommended a modified option (ii)(c) as follows :

Where council owns land in the floodways for river management, the options for secondary use is recommended to be :

To have a blend of commercial leasing or direct use of some river land, and recreational use of other land, with commercial use providing as much public access as practical. Recreational use being the particularly favoured use for town waterways such as the Taylor and Opawa.

Wairau River Management Plan

Community Panel Meeting

Friday 16 July 1993

At the final meeting of the community panel, a draft of the Wairau Rivers Draft Management Plan was discussed.

Mr A McIntyre expressed his disappointment that the plan proposed to discontinue a programme of works for the Wairau, upstream of Waihopai.

Mr J Broughan expressed concerns that strengthening work may be required on the northbank stopbanks in the Tuamarina area as well as work indicated for the south bank.

Otherwise the draft plan was accepted by the panel. Mr T O'Connor indicated that he was pleased with the proposed consideration for recreational access.

The meeting concluded with Clr M Briggs thanking the panel for their advice and input in the preparation of the plan.

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