

Lower Manawatu Flood Control Scheme



Lessons of Feb 04

Extreme weather in February 2004 caused the largest flood in the Manawatu River since 1902, with the Oroua River even worse hit.

This showed the 100-year flood was larger than previously anticipated, and a significant contributor was the loss of flood carrying capacity in the rivers due to deposition of silt and gravel during and after extreme storms. The effect of this is worse than expected prior to 2004.

In particular, the 2004 flood in the Oroua River was massively in excess of anything that could reasonably have been predicted. Its flood protection standard is clearly much less than the Lower Manawatu Scheme (LMS) standard, and the problem is made worse by serious siltation in the lower reaches.

The 2004 flood demonstrated that the LMS did not provide the required 100-year protection, and that a major upgrade project was needed.

Please give us your feedback!

This newsletter is to tell you about Horizons Regional Council's plans to improve flood protection across 28,000 ha (280 square km) of low-lying land between the Manawatu Gorge and the sea. We are seeking public feedback on our works and rating proposals for the Lower Manawatu Flood Control Scheme (LMS).

Better flood protection and fairer rating

This closely settled and intensively farmed land has a long history of severe flooding by the Manawatu River and its tributaries. The network of stopbanks built during the past 85 years has generally stood the tests of time very well, but the extreme storm of February 2004 pointed to some limitations.

After several years of detailed engineering investigations and design, and based on the lessons learned from the devastating floods of February 2004, we believe it is vital to improve the standard of flood protection in the area covered by the existing Lower Manawatu Flood Control Scheme (LMS).

At the same time as we have been assessing the physical aspects of flood protection for the area, we have been reviewing the rating system. The money from rates is needed to pay for LMS capital works and the Scheme's ongoing operational requirements.

The rating system determines who should pay, and how much they should pay, in rates. The present rating system is based on the legislation of the 1950s, which had some serious limitations. We are now able to use the new legislation, which is more flexible, and we believe that the new rating system we are now proposing is fairer than the

old. The new classifications are intended to take effect from July 1 2009.

Some facts about the LMS

- The Lower Manawatu Scheme flood protection is provided by more than 250 km of stopbanks and we use methods including tree protection and rock linings to prevent the rivers undermining the stopbanks.
- The Moutua sluice gates and floodway, east of Foxton, are an important and effective component of the LMS. They are used in times of severe flooding to divert Manawatu flood flows past 30km of very slow-flowing, winding river channel.
- The LMS is designed to contain a 100-year flood, which has a 1% chance of being exceeded in any given year.
- Landowners who benefit from the LMS pay rates to the Scheme, in proportion to the degree of benefit they receive.

Upgrade project needed

In June 2005 a \$28.8 million Lower Manawatu Scheme upgrade project was approved by Horizons Regional Council for public consultation.

Although expensive, the project is not “gold plated”. It concentrates mainly on increasing the height of the 144km of stopbanks that were not high enough to provide adequate 100-year protection. The volume of earthworks is enormous, and that is why the cost of the project is so high.

Water flowing over the top of a stopbank is the most frequent cause of failure as it can erode the bank completely away. The proposed project is designed to minimise the chances of that happening, because it is the most serious risk. However, other risks remain: stopbanks can also be undermined by the river, they can slump if they are not strong enough, and leakage flows can erode stopbanks and foundations away from the inside. We will attend to the most serious of these other risks, but it would be unaffordable to eliminate all, or even most, of the other risks.

What we learned from public consultation

Between June and November 2005 Horizons invited feedback on the proposed upgrade to the Lower Manawatu Scheme through a public consultation process that featured public meetings, open days, and a hearing for public submissions.

As a result, the Council made a number of additions and alterations to the upgrade project. These are detailed in the Council meeting minutes, which are available on request.

Two key decisions made by the Council in November 2005 were:

The LMS is to be reclassified.

The “classification” is the system used to set the rates payable on each property. The more a property benefits from the LMS, the more it pays in rates. The existing classification was developed in 1952 -1953. Since that time many things have changed in the farming environment, and the legislation that governs rating systems has changed. The classification needs to be recreated from scratch to ensure fairness. The new classification is intended to take effect on 1 July 2009.

Work should start immediately.

The Council decided that doing nothing was not an acceptable option, and also that waiting for completion of the reclassification process would pose an unacceptable risk of flooding in the meantime. An interim funding arrangement to enable the upgrade work to begin was put in place until 30 June 2009. During the interim period, all construction was to meet 100-year flood standard.

Over the past three years we have carried out works to the value of \$9.5 million, with the main focus on the Oroua River, where the original flood protection standard was lowest. That work is now about 40% complete. Work on the Reid’s Line spillway to protect Feilding from the Makino Stream is also nearly complete.

Revised project ready for consultation

The Council’s Catchment Operations Committee meeting of 13 August 2008 endorsed for public consultation a revised upgrade programme. A new estimate of just over \$40 million has been calculated, taking into account the expanded works programme and increased construction costs over the last three years.

Major items added to the project after

June 2005 include:

- construction of a new bridge over the Oroua River at Kopane to replace the old, undersized bridge;
- upgrading of stopbanks on the right bank of the Oroua and Manawatu Rivers near Himatangi Block Road;
- extra money to be spent on the Tokomaru River and Linton Main Drain stopbanks to address leakage under the banks and problems with peaty material which led to a failure in the Linton bank in January 2008;
- construction of a new stopbank to protect Foxton Beach township against flooding from the sea during storm surges; and
- substantial mitigation of flooding in the Taonui Basin.

In order to avoid increasing the level of annual rates beyond the 2005 estimates, the duration of the project has been extended. Instead of being completed by 2015-16, the costs of the revised project will be spread over 10 years starting from now, with work now scheduled for completion in 2018-19. The downside is that it will take longer to reduce the risk to an acceptable level.

Table 1 gives a summarised breakdown of the components of the upgrade project and their estimated costs.

Manawatu stopbanks	\$6,914,466
Manawatu vegetation control	\$1,226,297
Moutoa gates and floodway	\$787,218
Oroua stopbanks	\$9,318,066
Kopane Bridge replacement	\$4,065,976
Taonui Basin	\$4,025,500
Tokomaru stopbanks	\$5,056,600
Linton Main Drain stopbanks	\$3,108,250
Makino-Reid's Line Spillway	\$2,648,226
Minor tributaries	\$2,905,084
TOTAL	\$40,055,683



The Taonui Basin

The Taonui Basin is the extensive low-lying area to the north-east of the confluence of the Manawatu and Oroua Rivers.

Historically, frequent flooding limited the Taonui Basin's productivity, but when the Lower Manawatu Scheme works were constructed in the 1960s, flood frequency was reduced enough to allow the land to become very productive. However, operation of the spillways causes extensive flooding at times in the Taonui Basin.

The LMS relies on five spillways that act as safety valves during major floods and greatly benefit much of the area protected by the LMS. Unfortunately, these benefits are at the expense of land in the Taonui Basin, which experiences substantial damage costs when the spillways operate. Data collected after the 2004 flood showed that land under water for longer than five days experienced damage and lost production costs of about \$2700 per hectare.

The status of the Taonui Basin is subject to debate. One point of view is that landowners have always known that the Basin floods, therefore they should just accept it, anticipate and plan for flooding, and they should pay for the benefits they do receive.

The other point of view, supported by Horizons, is that we need to accept the status quo of land use in the Basin. It is developed and highly productive, and contributes to the regional and national economy. It is unfair to charge rates on this land and then expect those ratepayers to accept the substantial damage costs, without making some effort to remedy the situation. We are therefore proposing works to mitigate the effects of spillway operation.

Reducing the impact on Taonui Basin

Some mitigation work will have to be done before the upgrade project proceeds much further, because eventually the upgrade works in the wider catchment will make flooding worse in the Taonui Basin.

By upgrading stopbanks, we prevent them from breaching and releasing water into the Te Kawau or Makerua areas. More water will consequently escape via the spillways and into the Taonui Basin. We proposed to raise or ring-bank some houses and farm buildings, and install large culverts to help reduce the duration of flooding.

Other mitigation will be needed to fully offset future damage costs. The Council considered three ways of doing this:

- Rate reductions for Taonui Basin landowners under the draft classification system. However, this was ruled out because damage costs are expected to be far too high for any reduction in rates to be adequate.
- Payment of monetary compensation. However, this is not acceptable because it would benefit current landowners, but not future landowners.
- Carrying out works that will benefit Taonui Basin landowners, now and in the future. This is the Council's preferred option.

Works to provide long term benefits for land in the Basin could consist of more culverts to further improve gravity drainage into the major drains, and possibly also into the Manawatu and Oroua Rivers. The other alternative is to contribute towards a large pump that would direct Burke's Drain water into the Manawatu River when high river levels close Burke's Drain gates. The decision on which option to pursue will be made after further consultation with Taonui Basin landowners.

Rating system changes designed to be fairer

At the same time as we have been investigating ways to make the system of flood protection for the Lower Manawatu Scheme more robust, we have been looking at ways to improve the fairness of how the capital and operational costs are met by ratepayers.

The existing rating classification, introduced in the 1950s, was limited by the legislation of the time. It only allowed councils to levy rates from those receiving benefits - not those contributing to the causes of any problems. It also allowed a maximum of six rating classes, which the existing Lower Manawatu Scheme (LMS) classification uses. Properties benefiting from the LMS are at present classified from A down to F, and landowners pay in proportion to the benefit their properties receive.

The new legislation allows the creation of as many classes as are needed to create a fair system. It also allows properties to be rated for their contributions to problems. It is more flexible than the old system, and therefore allows rating systems to be fairer.

Some key points of the proposed rating system:

- It recognises the benefits provided by the Scheme in terms of damage prevented.
- It has eight categories.
- Most categories are subdivided into several classes, making 25 classes in all.
- A property can be, and usually is, rated in more than one category.
- Seven categories recognise different types of benefit.
- The eighth category recognises the contribution to the problems addressed by the Scheme, ie. increased flows and sediment loads resulting from farming activities further upstream.

Coming up with a better system

The first step in our work to develop a fairer rating classification system for the Lower Manawatu Scheme was to carry out a "Banks Down" analysis. A computer simulation of the entire Manawatu floodplain showed where floodwater would go if the LMS stopbanks were completely removed. A wide range of flood sizes were considered, and maps produced showing floodable areas, depths and durations of flooding for different flood sizes.

The assumption was then made that the present farming operations would still take place, and the damage costs due to those floods were estimated. Rates were then assessed for each property in proportion to the damage costs prevented by the stopbanks.

This newsletter only gives an overview, because the rationale and the calculation of the rates for each class is complex. The full report, *Horizons Regional Council - Lower Manawatu Scheme - Development of a New Rating*

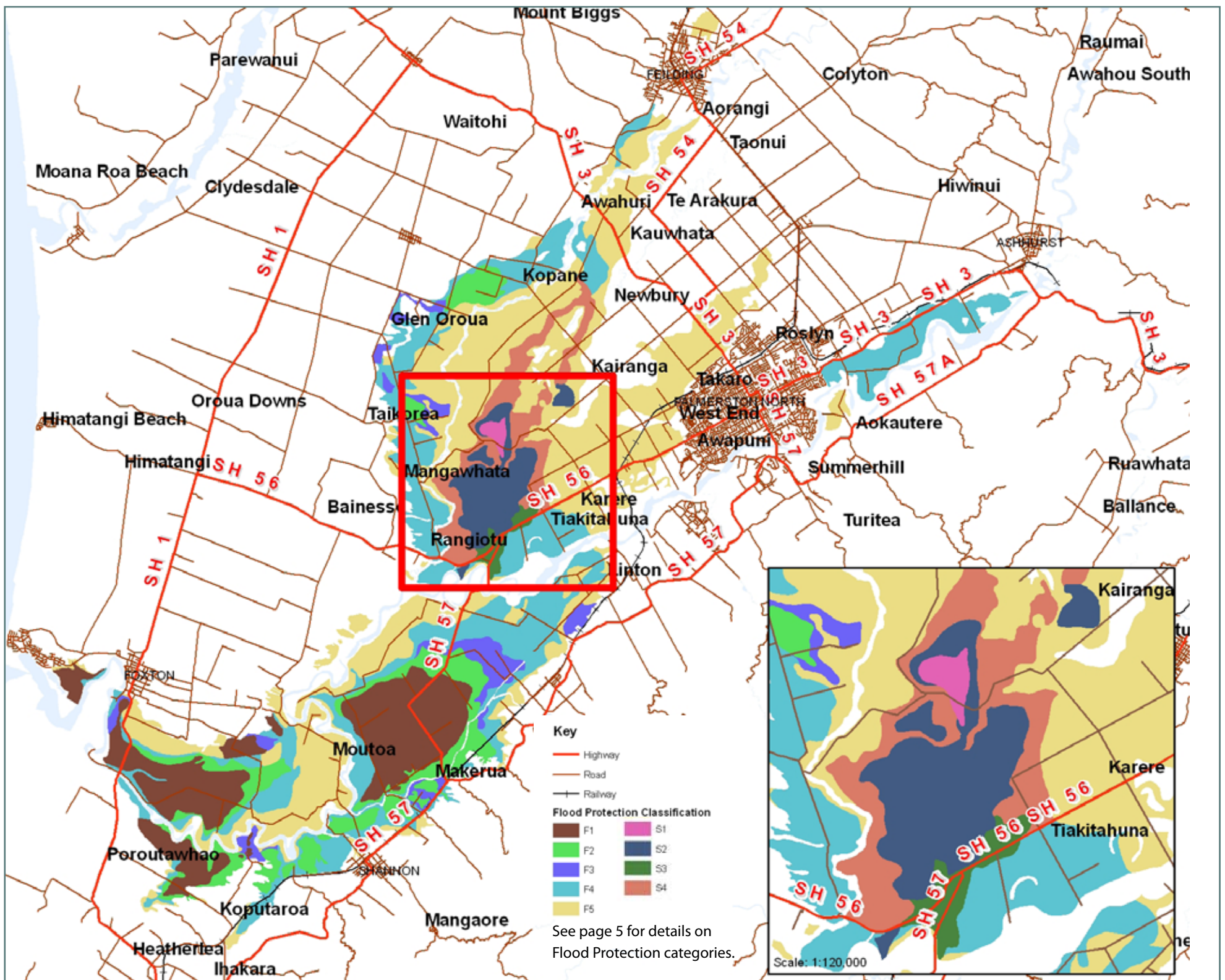
System, can be viewed at Regional House, 15 Victoria Ave, Palmerston North.

The different categories and their component classes are set out below. Note that the rates given are higher than those given in the full report. That report was written before the \$40 million estimate for the upgrade was finalised. The rates shown for 2008-09 are notional - they are what would be paid if the new classification was already in place. They are included so that ratepayers

can make comparisons with the rate demands they recently received. The rate increase necessary to fund the Upgrade Project will be phased in gradually, reaching a peak in 2012-13. Those peak rates are also shown.

For properties that pay a high level of rating, most of those rates are in the first three categories. They are all direct benefit rates.

Map 1 Lower Manawatu Scheme (2008) Flood Protection



Your guide to the draft rating system

Rating tables show Scheme rates that would be payable on 2008-09 land values if the scheme was in effect this year. Indicative rates are also shown for 2012-13, when rates will reach their peak and remain at that level for the duration of the Scheme.

Flood Control - Rural Land

These property classifications are designated F1 through to F5. The rate is a proportion of the land value of the property. The locations of the F1 to F5 categories are shown on Map 1. F1 land would flood the most frequently and remain flooded for an extended period if the LMS did not exist, and F5 land would be least frequently flooded and would clear of floodwaters relatively quickly.

Scheme rates payable (inclusive of GST) are:

Rating category	F1	F2	F3	F4	F5
Rate per \$100,000 of land value 2008 - 09	\$157.79	\$118.39	\$78.90	\$39.45	\$6.31
Rate per \$100,000 of land value 2012 - 13	\$200.80	\$150.60	\$100.40	\$50.20	\$8.03

Flood Control - Rural Land affected by spillways

These are designated SA through to SD. These classes are similar to F class land, but on infrequent occasions they receive substantial flooding from the spillways that direct water into the Taonui Basin. They pay less than the F classes for that reason. They are called S1 to S4.

Scheme rates payable are:

Rating category	S1	S2	S3	S4
Rate per \$100,000 of land value 2008 - 09	\$126.23	\$110.45	\$71.01	\$31.56
Rate per \$100,000 of land value 2012 - 13	\$160.64	\$140.56	\$90.36	\$40.16

Flood Control - Rural Houses

These property categories are designated H1 through to H4. Damage costs are substantial when houses flood, and the rates reflect this. The rate is charged per house. If the Scheme was not in place, H1 houses would flood the most frequently, and H4 houses would flood the least frequently. Flood frequency, height and house type are also taken into consideration in this analysis.

Scheme rates payable are:

Rating category	H1	H2	H3	H4
Rate per house 2008 - 09	\$647.94	\$485.96	\$356.37	\$291.57
Rate per house 2012 - 13	\$824.53	\$618.40	\$453.49	\$371.04

Channel Management

This rate covers channel maintenance work. It is paid on a 200-metre strip of rateable land on each bank of the Manawatu River, a 100-metre strip on the Oroua River, or 50 metres on the other tributaries. It is based on area of land rather than land value.

Scheme rates payable are:

Rating category	R1 (Manawatu and Oroua)	R2 (Other tributaries)
Rate per hectare 2008 - 09	\$34.99	\$7.00
Rate per hectare 2012 - 13	\$44.52	\$8.90

Drainage

The LMS maintains some drains. Generally land within 50 metres of any LMS drain is rated on an area basis, and pays \$77.10 per hectare. That rate will not increase because drains are not part of the upgrade project.

Flood Control - Urban areas

Palmerston North, Feilding and Foxton Beach receive direct benefit from the LMS. Other centres, such as Tokomaru and Shannon, are not floodable by the Manawatu or its tributaries, and do not pay an urban flood control rate.

Urban flood control rates have been assessed on the basis of the value of Scheme assets (stopbanks, riverbank protection, etc.) used to protect those urban centres, as a proportion of the total value of all Scheme assets.

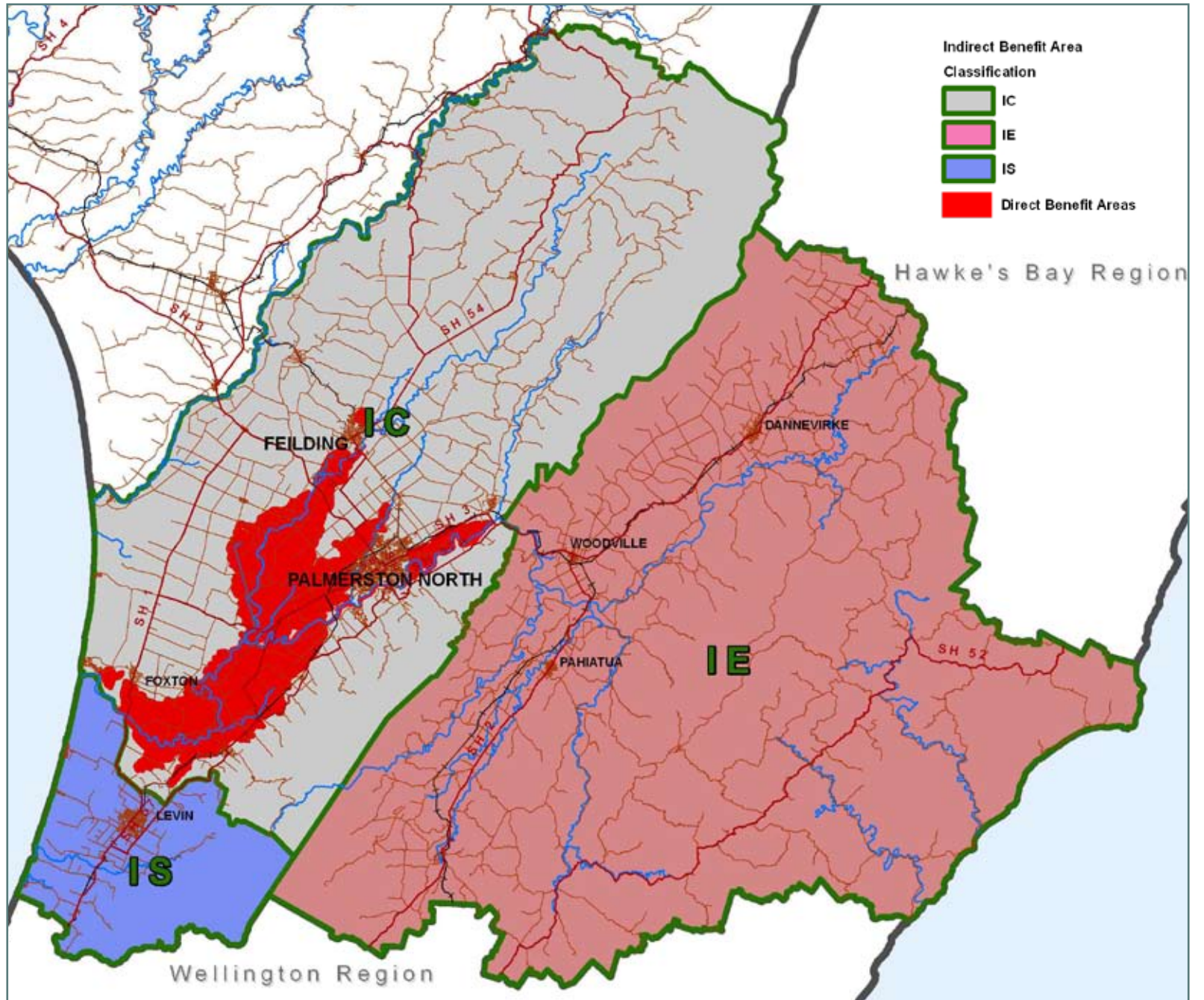
The urban centres collectively pay approximately 30 percent of the LMS rates.

Scheme rates payable are:

Rating category	PN (Palmerston Nth)	FG (Feilding)	FB (Foxton Beach)
Rate per \$100,000 of capital value 2008 - 09	\$6.21	\$9.56	\$4.45
Rate per \$100,000 of capital value 2012 - 13	\$7.91	\$12.17	\$5.66

Palmerston North has a higher standard of flood protection than the LMS 100-year flood standard. The extra funding needed to provide the higher standard is provided entirely by an additional rate levied on Palmerston North properties for that purpose and is not included in the above rates.

Map 3 Lower Manawatu Scheme (2008) Indirect



Indirect Benefit Rating

The LMS provides indirect benefits to a wide area, extending a long way beyond the areas receiving direct flood protection. The economy of the whole region is larger and more diverse than it would be without flood protection.

Before any flood protection schemes existed, much of the 28,000 hectare (280 square km) now protected was swampy, sometimes un-farmable, and providing occasional rough grazing at best. All of the protected rural land is now highly productive, with considerable flow-on benefits to the economy in terms of primary and secondary businesses and jobs.

The indirect benefits tend to diminish with distance from the direct benefit area. The area that will pay the indirect benefit rate is large, and is shown on Map 3. Areas south of and including Levin, and east of the ranges will pay a lesser rate. Areas within the Manawatu-Wanganui region but not shaded on Map 3 will receive a small amount of indirect benefit, but will not

pay LMS rates. However, like all ratepayers in the Region, they do pay the Horizons Regional Council general rate, and the general rate makes a contribution to the LMS.

Scheme rates payable are:

Rating category	IC (Central area)	IE (Eastern area)	IS (Southern area)
Rate per \$100,000 of capital value 2008 - 09	\$3.32	\$1.66	\$1.66
Rate per \$100,000 of capital value 2012 - 13	\$3.87	\$1.93	\$1.93

Contributor Rating

This rate is paid to recognise contribution to the cause of problems further downstream, ie. not for benefits received by the properties paying the rate.

The new legislation allows the charging of a contributor rate, and it is therefore included in the new draft LMS classification. The old legislation that governed the 1950s classification did not allow contributor rates, and only allowed rating for benefit received.

Farming activities in the entire Manawatu catchment have significant adverse effects on the Lower Manawatu Scheme. During heavy rainfalls, the original forest cover would have retained more rain water than the present pasture cover. Rainfall runoff flows off the land faster, now that it is covered in pasture rather than forest. This leads to higher floods in the rivers. The LMS therefore needs more flood carrying capacity than it would if the upstream catchment was forested.

Farming activities also increase the amount of fine sediment carried by the rivers. Additional fine sediment is therefore deposited on riverbanks and berms (the land between the riverbanks and stopbanks). This is particularly evident in the Lower Manawatu and Oroua Rivers. The flood

carrying capacity of the stopbanked river systems continuously decreases as ongoing siltation occurs.

Increases in river flows and fine sediment deposition mean that expensive additional earthworks are needed for the LMS. Stopbanks have to be higher than would otherwise be the case, and in places silt has to be removed from the berms.

All land within the Manawatu River Catchment is subject to the contributor rate. Land in the Pohangina-Oroua Scheme, and in the Lower Kiwitea Scheme (Rating Category CW) pay a reduced rate, because those schemes reduce fine sediment loads. Land to the east of the Manawatu Gorge (Rating Category CE) pays a reduced rate because of other river management schemes in place in those areas, and also because the Gorge slightly reduces the downstream flood flows.

Rates are assessed on an area basis, meaning properties pay the given rate per hectare.

The Scheme rates payable are:

Rating category	CL	CW	CE
Rate per hectare 2008 - 09	\$1.31	\$0.98	\$0.89
Rate per hectare 2012 - 13	\$1.53	\$1.14	\$1.03



Your rates: will they increase or decrease?

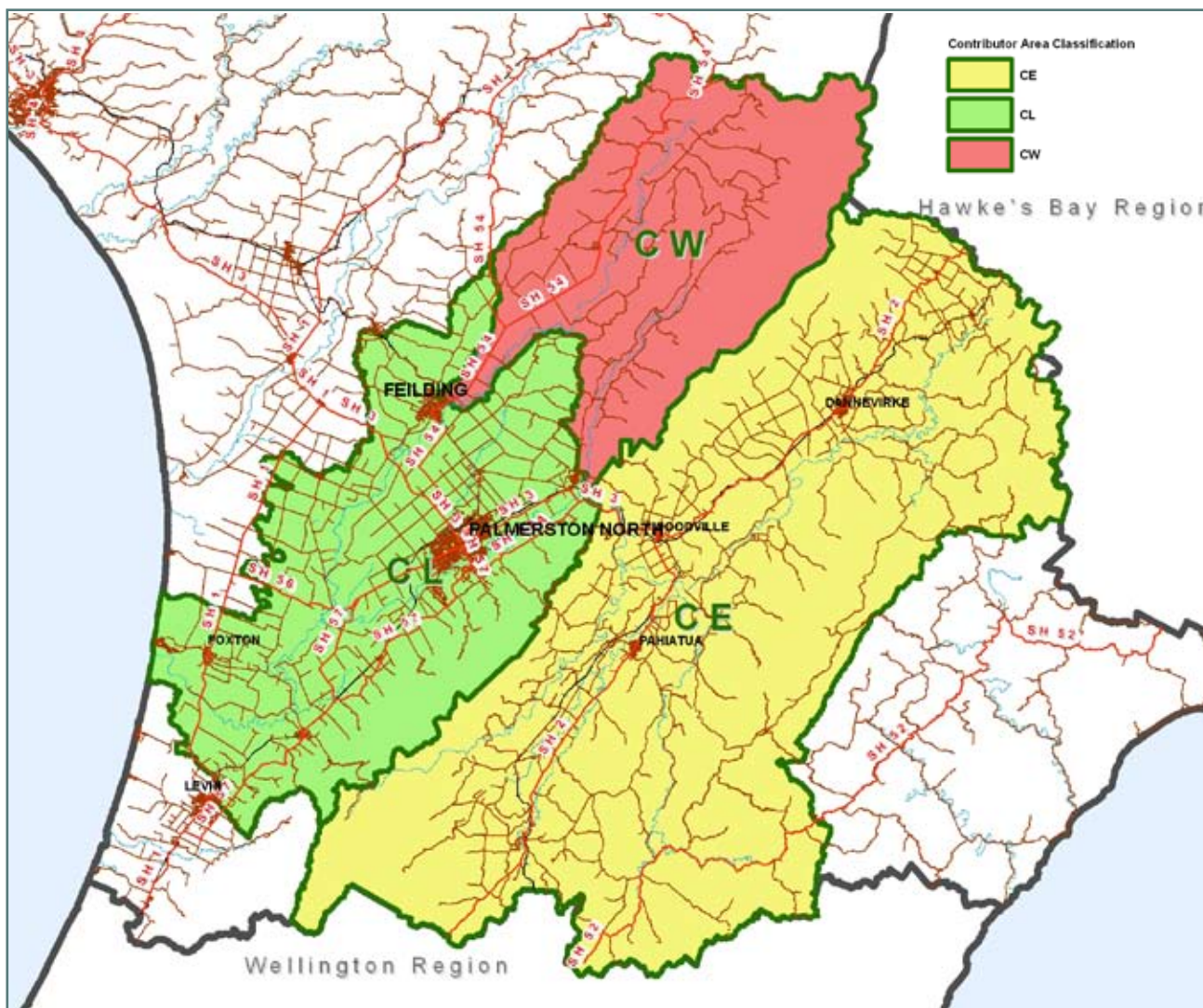
The existing rating system is funded mainly by direct beneficiaries of the flood protection the LMS provides. Contributors could not be levied under the old legislation, and the indirect benefit area was much smaller than the proposed new indirect benefit area.

In the old system, direct benefit rates provided about 94% of the funding, but the proposed new system sets the funding from direct benefit rates at about 60% of the total.

If the new system were in place right now, most direct beneficiaries would be paying less than they will in fact pay this year. Some would be paying slightly less, and some substantially less.

The total rate take will have to increase to pay for the project, and the increase will be phased in over three years. At the end of that time some ratepayers will be paying less than now, and others will pay more. There is unfortunately no simple multiplying factor that will give the difference between the old and new rates. The new system is quite different from the old. We believe the new system is fairer.

Map 2: Lower Manawatu Scheme (2008) Contributor



Please give us your feedback

We think it's important to provide the information you need to understand our Lower Manawatu Scheme flood protection upgrade and rating classification proposals, and to enable you to provide feedback if you wish.

Our consultation process includes this newsletter, public meetings, open days, and a non-statutory submissions process.

It covers two broad issues:

- The content of the upgrade programme; and
- The draft rating classification

See www.horizons.govt.nz for more information

What do you think of the upgrade plans?

Consultation on the upgrade programme is constrained by the fact that some decisions have already been made. After the consultation in late 2005, Council decided that "do nothing" was not an acceptable option, and that work should start immediately. It is a given that the upgrade will continue in some shape or form.

Consultation therefore revolves around the content of the programme. Submitters can advance arguments for removing or adding items of work to the programme. The main changes we are proposing involve additions to the programme and very little has been removed.

Another alternative is to accept a lower standard, eg. a 50 year standard. This is possible, and would reduce costs, but is not recommended, for several reasons:

- A 50 year standard is not a high standard, particularly since it will be reduced by climate change. Anyone farming protected land over a long period of time would quite likely be flooded. The higher cost of the 100-year standard represents a very good return on investment.
- The Building Act forbids residential buildings with a standard of flood protection less than 50 years. Global warming will reduce the flood protection standard, and eventually it would not be possible to build new houses anywhere in the LMS protected area.
- Some of the opportunity for savings has been lost, because some work has already been completed to the 100-year standard

Rating system is open for debate

You may wish to make submissions on the draft rating classification. While the proposed classification appears quite complex, we have put a lot of work into finding ways to spread the rate burden as fairly as possible.

However, we accept there will be varied opinions on that subject and ratepayers have this opportunity to express their opinions on any aspect of the draft rating classification.

Obviously, there is a bottom line. The Scheme receives a contribution from the General Rate (ie all ratepayers

in the Region), but apart from that all of the money needed to upgrade the Scheme has to be obtained from Scheme ratepayers. That means we face a balancing act between the different rating categories and any reductions for ratepayers for one category has to be matched by increases in other categories.

Time to have your say

Ratepayers may want to know what their rates will be under the new system, compared to the old system. In some cases there is enough information in this newsletter to enable rates to be calculated. In other cases, the small scale of the flood protection rate map makes that calculation difficult.

At a series of public meetings, open days and Scheme committee meetings, Council staff will be able to provide rating information for all direct benefit classes, and will be able to advise your indicative new rate, under the proposals as they stand currently. This will of course change if the consultation process results in changes to the draft classification system.

The submissions process gives individual ratepayers the opportunity to state their views in writing and/or verbally in person. Written submissions are invited, and will need to be received at Regional House by 5pm on 31 October 2008. Submitters who want to be heard by

the Hearing Committee will be able to appear at a hearing on 21 or 24 November.

The Committee will make its recommendations to the full Council meeting on 16 December 2008. Council will then decide on the final form of the classification. It will also decide the content and therefore the funding requirements for the LMS Upgrade Programme, for inclusion in the 2009-10 Community Plan (LTCCP). Further submissions can then be made through the statutory Plan process early next year. The final upgrade proposal and rating classification will be confirmed with the adoption of the Plan in June 2009.

How will you be affected?

Please come to a public meeting or open day to talk to our engineering staff about how you will be affected by what we are proposing, and to give you the information you need to decide whether to make a submission.

Location	Time and Date
Te Kawau Recreation Centre , Wye Street, Rongotea	Thurs 2 Oct 7pm
Rangitikei Club, Bowen Street, Feilding	Fri 3 Oct. 2pm
Manawatu Boating Club, Foxton Beach	Sat 4 Oct 10am
Shannon Rugby Club Rooms, Stout St, Shannon	Mon 6 Oct 7pm
Open Day Regional House, 11 Victoria Ave, Palmerston North	Wed 8 Oct 10am-6pm
Whakarongo School Hall, Stoney Creek Rd, Whakarongo	Thurs 9 Oct 7pm

Send your submission to:

LMS Scheme Submissions
Horizons Regional Council
Private Bag 11025
Palmerston North 4410