greater WELLINGTON
REGIONAL COUNCIL

Waikanae Floodplain Management Plan – 10 year Review

Summary Report

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Executive Summary

Purpose of the Review

The purpose of the first 10 year review is to evaluate the performance of the Waikanae Floodplain management Plan to date and assess whether there is any need to change the outcomes and implementation process.

This summary report will be used as the basis for consultation with KCDC in the first instance. The report will then be distributed to Friends of the Waikanae River, community groups, organisations and interested and affected residents along with the wider public. A summary of the issues highlighted by the review is given in Section 4 of the report.

Following the consultation process and any further analysis required, the summary report will be updated and implemented in accordance with recommendations approved by GW.

Background

The Waikanae Floodplain Management Plan (WFMP), completed in 1997, recommends non-structural and structural measures to manage flood risk. Greater Wellington (GW) adopted a 40 year time frame to fully implement the WFMP with reviews proposed every 10 years.

The WFMP contains a set of 'outcomes' developed as a result of examining various options. The outcomes covered four main areas:

Non-Structural - These include land use measures such as providing information and advice, river corridor land procurement and management and providing direction to Kapiti Coast District Council (KCDC) regarding planning controls on the Waikanae floodplain. They also include community preparedness such as providing up-to-date information, assisting KCDC in public education programmes and emergency management, encouraging individuals to insure against flood loss and damage, operating flood warning systems and disaster recovery.

Structural - Structural measures were selected to protect existing development from floods. Generally they are designed for a 100 year flood event, this being the level of protection selected by the community for urban areas. They include road raising, stopbanks, bridge lengthening and house raising.

River Management - These measures include the day-to-day activities and the programmed major works undertaken by GW to maintain the Waikanae River in its preferred alignment and to protect and maintain existing flood mitigation structures.

Environmental Strategy - The original objective of the environmental strategy was to provide a master plan for enhancing the landscape and environmental values of the river corridor below State highway 1 to the river mouth.

Summary of Findings

Hydrology/Hydraulics

The hydrologic investigation completed by NIWA (Reference 2), included reviewing the 100 year flood design standard, using the additional river flow information available since 1992 and estimating the potential climate change impacts on the design standard. The investigation found that the estimate for the 1 in 100 year return period flood flow remains close to the 1992 result.

Flood levels along the river channel were estimated using an improved hydraulic model. Results show that river channel flood levels have increased by up to 500mm above El Rancho and up to 1000mm below El Rancho, when compared to the 1992 results. These increases are a result of updated survey information, recalibration based upon recent flood information such as the 2005 flood event (1 in 80 year return period), revised estimates for storm surge and assumption of a southerly mouth position.

The progressive nature of the development of the hydraulic model over the years means that the information used for the design of structural works is close to current estimates. Notably all new stopbanks constructed meet the present 1 in 100 year design standard. The exceptions are in the Toroa Road area where 4 houses have been raised and the Otaihanga flood wall where 100 year flood levels have increased by 360mm. The remodelled indicate that currently these areas are only protected for a 1 in 50 year flood event.

Climate Change

The climate change impacts on the river flood flows are estimated to be an increase in the order of 10% and 20% in 1 in 50 and 1 in 100 year flood events respectively. This is a result of predicted increases in frequency and magnitude of high intensity rainfalls. Together with this it has been recommended that allowances be made for a sea level rise of 200mm by the 2040s and a rise of 500mm by the 2090s (References 2, 3 and 4).

The overall estimated effects of climate change would result in further increases in flood levels by up to 200mm by 2040 and up to 400mm by 2090. The upper limits apply mainly in the tidal areas at Otaihanga and Waikanae Beach.

Future Remodelling

The investigations did not include any hydraulic modelling of the floodplain. The model could be improved with updated LiDAR (ground level) data and the improved two-dimensional modelling tools. At this stage the remodelling of the floodplain is not due until 2015.

Non-Structural Measures

Good progress has been made in mitigating flood hazard through the Kapiti Coast District Plan. The Waikanae flood hazard was initially included in the District Plan in 1995 and later amended in 2002 to include revised flood hazard categories as a result of new stopbanks constructed. The district plan measures, together with advice provided

by GW has been successful in requiring development in flood hazard areas to either take into account the flood hazard and/or construct dwellings with a minimum floor level.

Between 1995 and 2009, the majority of building consents issued in the flood hazard areas included a minimum floor level condition to the 1 in 50 year level. These were mainly for infill development. KCDC have estimated that a further 350 vacant sites could still be in filled within existing residential areas identified as being within the 1 in 100 year flood spread. These sites would only require building levels to the 1 in 50 year level.

The district plan has no rules to provide control over activities in flood risk areas that would flood in a greater than 1 in 100 year event. These areas are however shown on the KCDC website as residual overflow and residual ponding.

The total land area in public ownership in the river corridor has increased from 71.45% to 76.56%. Land purchase has taken place primarily as a result of implementing the capital works programme. Reserve contributions through subdivision have not been significant at this stage. Land purchase remains an important mechanism to avoid development in the river corridor and facilitate river corridor maintenance and improvement works.

GW has provided generic flood hazard information to the public, improved the flood warning system, responded to flood events and participated in joint exercises with KCDC. The WFMP needs updating to reflect current practice and links for Civil Defence and Emergency Management.

Flood Protection, Environment and Land Management departments of GW provide advice to land owners and other users in the upper catchment on minimising erosion of land and river banks. There has been limited success in this area and GW recommends that this is discussed further with KCDC. Options to be discussed include incorporating the provision of advice to land owners as a primary objective in the proposed Open Space Strategy and implementing and supporting the upper catchment vegetative framework which has been developed for Waikanae.

Structural and River Management Measures

Overall good progress has been made in implementing the WFMP structural and river management measures in the last 10 years and the plan is on track for completion by the target date of 2040. By June 2009, the measures were 44% complete providing 68% benefits in terms of total damages saved (Reference 1).

Stopbanks that have been completed are Kauri/Puriri Road, Chillingworth and Otaihanga Domain. The Kauri/Puriri Road and Chillingworth stopbanks contained the 1998 (15 and 28 year flood events) and 2005 floods (1 in 80 year flood event), providing protection to over 450 houses. Previously the stopbank only provided protection for a 10 year flood event. The proposed Otaihanga Domain stopbank was replaced with a flood wall following public consultation. The flood wall overtopped during the 2005 flood. The revised 1 in 100 year flood design level estimate for this floodwall is 360mm higher than the top of the existing floodwall. Further structural measures completed include Otaihanga road raising-Stage 1 and the raising of 5 houses.

The outstanding structural measures all require further investigation and re-prioritising. A summary of the progress made is given in Attachment 2.

River realignment and bank edge protection works that have been completed are Otaihanga (part), El Rancho, Jim Cooke Park, River Glade, Kebbels, Edgewater Park and State Highway One. These works have performed well during subsequent floods, except for the Kebbels grade control weir and some rock groynes, which have eroded on a number of occasions and required topping up. River realignment and bank edge protection works that have not yet needed to be carried out are the mouth, Otaihanga (except part) and Greenaway Road.

The agreed river training techniques have been relatively successful in maintaining the river channel within the preferred channel alignment, recognising that the implementation of additional programmed major river works have been required following major flood damage. With the completion of the programmed major river works, the balance of types of methods has changed to reflect the increase in permanent works in the river. As a result the amount of maintenance to rock edge protection has increased and the quantity of cross-blading has reduced. Approximately 80% of the river channel is maintained within the preferred channel alignment.

Gravel extraction has been carried out annually, as recommended following 5 yearly bed level surveys, in an attempt to maintain overall bed levels at the status quo (1991 surveyed levels) where possible, and hence maintaining the existing channel capacity of the river. Overall the results show a general trend of aggradation (gravel build-up) from the mouth to Jim Cooke Park (JCP) and degradation (gravel erosion) above this point.

During the last 4 years it has not been possible to extract the annual quota of gravel within the tidal reaches of the river owing to resource consent restrictions. Extraction has mainly occurred between El Rancho and JCP. Therefore it is likely that gravel is building up below this point. Whether or not this build up is significant and what options there are to address the issue should be clarified following completion of the next bed level survey and gravel analysis in 2010. The cause of this build up has not been rectified through existing dry or wet extraction methods.

The river mouth has been inspected on a regular basis to ensure that the existing rock groyne at the mouth continues to operate effectively, the sand level between the groyne and the beach is generally below high water spring tide level and that mouth cuts are carried out when required. Minimal maintenance has been necessary since the mouth was last cut in December 2001. There are issues relating to gravel/sand build up just upstream of the mouth. It is recommended that this issue be considered as part of the proposed 2009/10 gravel analysis.

Monitoring of River Processes

The monitoring activities as described in the WFMP (Section 3.3.5) have by in large been carried out and improved. Monitoring of the river has proven to be a useful tool in understanding the river processes, taking preventative measures and planning to mitigate potential flood hazards on the floodplain. Monitoring needs to be implemented in an ongoing manner as new research reveals improved ways of applying flood risk management.

Environmental Strategy

An Environmental Strategy was developed in 1999 by GW and KCDC with input from Iwi, DOC, landowners, environmental organisations and the community. The first 10 year review is currently underway and will be completed in 2010. This review acknowledges the intentions of GW and Kapakapanui Te Ati Awa ki Whakarongotai in ensuring the incorporation of the Ecological Strategy for the Waikanae River into the Environmental Strategy[1]. A reach has been added to the Strategy to acknowledge the importance of middle to upper catchment restoration work.

The Strategy identifies methods for protecting and enhancing the river corridor. Most of these have been agreed with the Waikanae community and Friends of the Waikanae River (FWR). Using the Strategy as a guide for best practice restoration GW prepared a 5 year planting plan for FWR. Considerable progress has been made in the restoration of areas of the Waikanae River by the community groups with help from KCDC and GW. An improved link in policy has been identified through the environmental outcomes of the report based upon the Otaki Floodplain Management Plan. This ensures that the Environmental Strategy and Environmental Code of Practice are used to guide best practice to flood protection management.

Tangata Whenua

To date, our responses with Iwi/hapu have largely been issue driven or in response to resource consent applications and compliance. This approach does not provide opportunities to address wider issues or planning. Further opportunities through the Environmental Strategy and the proposed regional Natural Resource Plan should be advanced with local Tangata Whenua, with a focus on strategic responses to sites of significance and the implementation of cultural health monitoring.

[1] Kapakapanui Te Ati Awa ki Whakarongotai & GW Flood Protection. (1999). Ecological Strategy - Waikanae River Operations and Maintenance Consultant's Brief, p.5.