



CONFERENCE 16/17th April 2007 Duxton Hotel Wellington

## CASE STUDY

# Managing Flood Risks on the Thames Coast

Thames Coromandel District Council  
Environment Waikato

### Presenter

Scott Fowlds  
Group Manager, River and Catchment Services  
Environment Waikato

### Presented By



### In Association With



### Principal Sponsor



## Executive Summary

**Trickling streams became raging torrents within minutes**

Immediately following the 2002 Weather Bomb on the Coromandel Peninsula, Environment Waikato (EW) and Thames Coromandel District Council (TCDC) started working on a joint project aimed at developing a comprehensive flood mitigation package for the Thames Coast. As a result of this collaborative approach, a successful business case was made to central government and a detailed work programme developed as part of the "Peninsula Project". The project is based on an integrated catchment and inter-agency approach and includes initiatives such as soil conservation works, pest management, flood protection, river management and (more recently) land use planning controls.

**Environment Waikato:**

*An engaged community – healthy environment.*

*Clever people, creative solutions, and enduring results.*

*To sustainably manage the region's resources, working with the community to benefit present and future generations.*

**Thames Coromandel District Council**

*One Peninsula – Diverse Communities.*

*Enabling the wellbeing of the living environment.*

*Community Fulfilment.*

The project has also determined roles and responsibilities across the relevant agencies and funding arrangements. The desired outcomes were achieved/facilitated via a strong inter-agency project team lead by the regional and district council. Crown agencies and key community representatives also played a significant part.

### Initial Environment

The Coromandel Peninsula has more than 9,000km of rivers and streams. Over the years, very little money had been available to maintain these catchments to ensure they did not cause problems downstream. The lack of collective catchment management also led to damaged infrastructure, loss of productive land, increased flooding and damage to native bush, estuaries and harbours. Coupled with frequent high intensity rainfall storm events (for which the Coromandel is renowned for), high population growth, and the proximity of development to major watercourses, risks to both life and property grew to unacceptable levels at some locations. This was no better highlighted than during the June 2002 Weather Bomb when a camper at the Waiomu Campground lost her life after being swept out to sea by the adjacent swollen river.

Something urgently had to be done to lower risks to life and property, stabilise stream and river channels and reduce erosion and debris. There was also a need to reduce sedimentation and improve forest health in the upper catchments long-term. As a result, EW and TCDC staff (with strong support from elected representatives) developed and launched the Peninsula Project, which later gained crucial support from Central Government.

### Description of the Project

EW (as the lead agency) developed a major new initiative called "The Peninsula Project", with input from people in the community and key stakeholders. Four agencies (Thames-Coromandel District Council, Department of Conservation, Hauraki Maori Trust Board and EW) formed a partnership under this project to improve the health of the environment and the safety of communities on the Coromandel

Peninsula.

The Project aims to address three key areas of concern - soil erosion, river management and flood protection. It became the 'enabling' mechanism to fund works, an integrated catchment management and community/stakeholder partnership approach to deal with the problems. Three key areas of work are being promoted through this project:

- Pest management - primarily possums and goats which are causing major damage to the bush leading to soil erosion and increased run-off
- River and catchment management - hill slope and stream bank planting to prevent erosion and further slippage
- Flood protection - to protect people, buildings and other essential infrastructure.

These key areas of work were identified as being fundamental to our integrated catchment management approach (i.e. mountains to the sea) and were also cognisant of our collective river management experience. One of the first target areas of the Peninsula Project was the Thames Coast, due to the devastating effects of the Weather Bomb event in 2002.

### **Governance and Management**

Environment Waikato and TCDC have responsibilities under various Acts to address flood hazard risks. The weather bomb of 2002 was the catalyst for both Councils to work together in a partnership approach. The devastation that occurred and the resulting cost meant a new approach to how we manage these hazards was needed. Essentially, it was recognised that we needed to work together towards mutually agreed outcomes.

The basis of this partnership largely rests on the goodwill and adoption of best practices by the key agencies. An MOU exists between the Department of Conservation and EW concerning pest management. The partnership is maintained via regular liaison meetings and a regular pamphlets/newsletters which outline/confirm the roles and responsibilities of each agency with the communities.

Environment Waikato, with the primary responsibility to address flood hazards and river management took the lead role. A Liaison Subcommittee, with reporting responsibilities to Environment Waikato's Catchment Services Committee, was established with political representatives from both Councils and representatives from other agencies, Iwi and landowners to provide oversight of the whole programme. In terms of approval for proposals reports are made to the Liaison Subcommittee and then through to both Environment Waikato and Thames-Coromandel District Council. From time to time joint Council meetings are held on significant matters.

At the staff level a flood management project team was established with representatives from both Councils. An animal pest control project team was also established as part of the project and is managed by the Department of Conservation. The challenges of working in a partnership are mainly around navigating the different drivers and cultures that sit within each organisation. At times interest from one party or another may vary depending on what the focus of the project is at the time. Regular staff meetings and reporting to Council have helped ensure that momentum is maintained and agreement on approach is reached.

### **Financial Management**

Through the project development stage, each Council has funded their own time and resources. Each agency had responsibilities for managing and funding implementation of their own functions (e.g. the Department of Conservation for pest management on crown land and Transit New Zealand for state highway/bridge upgrades). Funding of specific flood protection works on the ground is the responsibility of EW, with support from Central Government (as per the Business Case), Regional funding, Peninsula funding and targeted rating on the local community specifically for flood protection works (as set out in specific Peninsula Project Funding Policy).

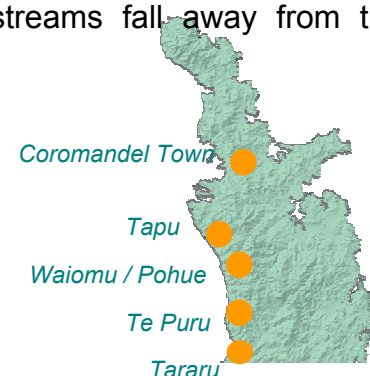
### **Responsibilities**

From the beginning the responsibilities of both Councils were pinned down. Essentially, Environment Waikato took the lead in developing flood mitigation proposals as it had the technical expertise to do so. TCDC took the lead in developing planning controls and a variation to their District Plan that would support those proposals. While EW had wide experience in consulting with communities on flood protection works to bring to the partnership, TCDC had an understanding and history with the Thames Coast communities built up over many years. This collective experience and skill set was needed to ensure the success of this project.

### **The Thames Coast**

This coast is unique, stretching for 45km from Thames in the south to Coromandel township in the north. Many small distinctly steep catchments with dozens of rivers and streams fall away from the Coromandel Ranges and drain into the Firth of Thames.

Beach communities are home to around 4500 permanent residents. Over the Christmas period, the population swells dramatically. Most homes have been built upon alluvial fans – low-lying land



created from soils and debris washed down from the surrounding hills. These deltas are extremely unstable and lie in the path of floodwaters, eroding rapidly during floods.

Because of its geography and location, the Thames Coast is particularly vulnerable to severe flooding, and rivers and streams constantly change course.

### **A Cooperative Project Management Approach**

People on the Coromandel Peninsula have endured flooding caused by swollen rivers and streams for decades. There have been three 100-year flood events since January 2002 requiring both immediate and longer term responses to address issues as a result.

The 'Thames Coast Project' required a special approach since many of the issues at hand were long standing and extremely sensitive. It was the first time any agency within the Waikato Region had embarked on a '*whole of catchment*' approach involving a combination of measures from pest control right through to civil defence. The five Thames Coast communities hit hardest by the Weather Bomb – Tararu, Te Puru, Waimou/Pohue, Tapu, and Coromandel Town – were identified as being the project's focus.

Immediately following the weather bomb there was community demand for something to be done to alleviate future risks. This 'demand' initially stemmed from a series of public meetings immediately following the Weather Bomb, but more formally through the community-based working parties that were established as a basis for reporting to Councils. This process was driven by both Councils. In developing options for community consideration, a detailed work programme was developed to ensure each of the components were systematically addressed, those being:

- Baseline information
- Technical/engineering assessments
- Proposed management options
- Weather Bomb Economic Study and Survey of Residents
- Insurance/Climate Change Study
- Central Government involvement.

The objectives were to look at long-term solutions, sustainable outcomes, minimise risks to life, develop practical and cost-effective solutions and produce a recommended proposal for public discussion.

#### Gathering Baseline Information

##### **1. Rainfall Patterns**

An initial assessment of the rainfall pattern provided raw data for hazard mapping and river modelling.

##### **2. Flood Hazard Maps**

EW developed a set of flood hazards maps for each of the five communities to help predict areas most likely to be flooded in a 100-

*Future impacts of climate change and sea level rise were also considered*

year flood event or greater. The maps were based on:

- Historical events and damage reports
- On-site observations, verified by local residents and local Civil Defence staff
- River modelling work
- Surveying to assess peak water heights
- Flood extent assessment following the events.

The flood hazard was split into three zones – high (red - posing the greatest risk to life), medium (orange) and low (yellow).

An effective project management technique then included taking these draft maps to a select group of affected residents (from each community) to verify/gain support for them prior to wider community feedback. The maps were also externally peer reviewed by a major engineering consultancy firm as technical accuracy was seen as being absolutely paramount.

*Because of its Geography and high rainfall, the Thames Coast is particularly vulnerable to river flooding*

### **3. Risk Assessment**

EW and TCDC then engaged URS New Zealand Limited to carry out a qualitative flood risk assessment on the Thames Coast to estimate the risk to life from a 100-year return period event at each of the five settlements, prioritise the risks and quantify the benefits from risk mitigation works. The results showed that the calculated risk to life was intolerable in some areas, particularly at Waiomu. However, risk reduction could be achieved by implementing various engineering and treatment measures.

### **4. Technical Investigation**

A technical investigation quantified the existing river flood hazard at each of the five priority communities on the Thames Coast to develop a range of proposals to reduce them. The investigation involved information collection, hydrological assessment and hydraulic assessment.

### **Proposed Management Options**

The hazard and risk management issues on the Thames Coast are complex and involve a number of interrelated factors that combine to make the risk immediate and extreme. EW and TCDC (through the Peninsula Project) have been working with the communities and other key stakeholders involved to come up with this comprehensive and integrated approach.

The technical assessments outlined above allowed a series of management options to be developed including a full cost-benefit analysis for each option at each community under the following range of activities:

#### **1. Response and warning procedures**

Each of the five communities has a well-established and tested civil defence network in place. Community involvement includes river watches, evacuation plans, and emergency procedures in

campgrounds. Community focus groups have been established to ensure that procedures are kept current, plans are tested, and new residents informed of the risks.

*The calculated risk to life was intolerable in some areas*

## **2. Planning and Building Controls**

The total value of private property in the flood hazard zones within each community is around \$60 million. Some of these properties are located very close the stream's edge and are in the primary flood way. They therefore pose the highest risk to life in a 100 year flood event. Three options for the purchase of these properties were considered:

- Full purchase/removal of all properties within the flood hazard areas
- Partial purchase/removal and house-raising in the high hazard zone
- Targeted purchase in combination with other flood protection works

The purchase and removal of properties, however, did not provide a complete solution, as there would still be ongoing maintenance costs to ensure the capacity of the existing flood channels were maintained. The preferred option was to purchase those properties in the very high risk category only and undertake flood protection works as proposed (see below).

*"In the June 2002 flood, one person died. The direct and indirect costs associated with the five floods are estimated at \$56 million. For the June 2002 flood alone, there were \$13.2 million of direct costs to the Thames Coromandel District and other significant costs to the Crown, individual home owners, and businesses. Ministry of CDEM press release, 22 Sept 2004.*

The other method used was the necessity to implement stricter building and planning controls to prevent further development in the highest risks areas.

## **3. Flood protection works**

Both EW and TCDC closely examined the costs and benefits of each level of flood protection for the five communities. The proposed works have been undertaken in combination with the building and planning controls outlined above. The stream channels have limited capacity with uncontrolled overflows occurring quite frequently, and planning and building controls do not solely address those issues. Flood protection works are therefore deemed necessary to stabilise stream channels, keep the floodway clear, and reduce the extent of flooding up to and including a 100 year flood event.

## **4. State Highway 25**

State Highway 25 (SH25) is the main road linking the Thames Coast settlements. It crosses over a number of streams and rivers using bridges and culverts that vary in design and flood carrying capability. Parts of SH25 have been identified as significant impediments to the unrestricted passage of flood flows and debris. Adequate flood hazard mitigation could therefore not have been undertaken without addressing the impacts of the SH25 infrastructure.

## **5. Catchment Management**

Many of the catchments along the Thames Coast are steep and rugged and subject to very high intensity rainstorms. As a result, catchments are vulnerable to erosion and run-off, while downstream river systems are highly exposed to flash flooding and sedimentation. The vegetative

cover and condition of these catchments is a significant factor in the extent of erosion and flooding. The condition of significant areas of the forest is poor mainly due to browsing animal pests such as goats and possums. These issues increase the risks of flooding in the lower reaches and therefore need to be managed collectively.

## A Participatory Approach

A fundamental component in the success of this project has been the support and participation that has been gained by communities, other agencies and Iwi. This participatory approach has enabled an integrated approach to river and catchment management along the entire Thames Coast.

### **1. Community Meetings**

Our starting point was a series of community meetings held at each of the Thames Coast communities as a key means of seeking feedback on the above proposals and gaining community involvement in the decision making process. These meetings provided an ideal opportunity to bring together local residents, technical staff and elected representatives to discuss work that had been carried out since the weather bomb, to present and receive river and catchment management options, confirm cost and funding implications, and to establish a clear pathway forward.

### **2. Key Stakeholders**

Supporting community consultation was relationship building with some of the key stakeholders in the project. This included:

- Discussing pest management issues with DOC, as the landowner of significant parts of the upper (forested) catchments, and Transit NZ, as the owner/operator of State Highway 25
- Working with insurance company IAG, which has entered into a partnership arrangement with EW and TCDC to proactively reduce both current and future flood risks on the Thames Coast, including a climate change assessment
- Forging positive working relationships with local Iwi (supported by the successful partnership with the Hauraki Maori Trust Board)

### **3. Council-Community Working Parties**

Another extremely valuable and effective project management technique was the establishment of a working party in each of the five priority communities. These working parties comprised community representatives, local Councillors and EW and TCDC staff. Their purpose is to work with the Councils to determine and recommend preferred management options to address catchment and flooding issues. They act as a conduit of information to and from their communities and share information and ideas with staff.

### **4. Newsletters**

A key means of keeping the wider community informed on

developments with this project and ensuring awareness of Council 'accessibility' has been a series of newsletters. These are regularly produced and distributed across the Thames Coast to keep residents up to date on latest developments (particularly in regard to the construction of flood protection works and channel clearance), present any new proposals, confirm upcoming community meetings, and to provide an opportunity for feedback.

### **5. Information Days**

The opportunity has been provided on two occasions for the public to attend information days on the Thames Coast proposals. The agencies have collectively displayed information on flood protection, river management and animal pest control proposals, with staff available to answer questions.

### **6. Economic Study**

Separate to, but in support of the proposals being developed by EW, TCDC and the five Thames Coast communities, a report was commissioned by the New Zealand Climate Change Office (Ministry for the Environment) to investigate the social and economic impacts following the June 2002 Weather Bomb event. The report evaluated direct and indirect costs, gave a macroeconomic view of the event in terms of its region-wide economic effects, and to improve the understanding of the impact on the community affected in terms of their preparedness and perception of risk. The data collected for the study was primarily achieved through household surveys and personal interviews.

### **7. River Flooding – Reducing the Risk Report**

This document was the first in a programme to help people understand some very complex issues about river flooding on the Thames Coast – and what can be done about it. More importantly, it also outlined the proposed management options and likely funding implications at each of the five communities. This publication effectively provided the platform for putting together a strong case for central government assistance.

### **Key Challenges**

A range of challenges and issues made progress difficult at times. These included:

- Diverse & scattered communities (some with preconceived ideas)
- Absentee ratepayers
- Changing needs and expectations
- Defining affordable/feasible solutions
- Relative priority of different communities
- Pressure to 'do something' - less talk more action
- The emotional element
- Who should pay
- Bringing in central government.

## Central Government Involvement

***“I am impressed that EW through its CDEM partnership, is factoring climate change into mitigation options, developing flood management protocols for assessing risk, river management planning, and increasing community awareness”.***

*The Hon George Hawkins, Minister of Civil Defence Emergency Management, letter to EW dated 2 May 2005 (re: Waikato CDEM Group Plan 2005).*

On 22<sup>nd</sup> April 2004, the “*Reducing the Risk – River Flooding on the Thames Coast – A Business Case to Central Government*” was submitted to the Minister of Civil Defence and Emergency Management, the Hon George Hawkins, for Cabinet’s consideration and approval. The Business Case specifically sought central government assistance to address the flood risks on the Thames Coast. EW and TCDC, with support from DOC, collectively developed a proposal that sought assistance from the Government in three key areas:

- Central government agencies (DOC and Transit NZ) meeting their responsibilities as a landowner and infrastructure manager by addressing the adverse effects of their activities
- Funding assistance to support removal of high-risk properties, establishment of flood pathways and associated flood protection works
- Support for the overall strategy and work programme (i.e. Peninsula Project) to address soil conservation, river and catchment management and pest control issues over the entire Peninsula.

The Business Case hinged on the importance of:

- Developing a comprehensive and integrated package of proposals that would largely eliminate the present high risks to life, and establish a sustainable foundation for these communities in the future
- Central Government involvement being a critical component
- Agencies and the communities all working together
- A model for the rest of the country
- Central government could not afford not being there

On Wednesday 22 September 2004, the Government announced it had agreed to fully support the Business Case by contributing a multi-million dollar package to the integrated flood management package for the Thames coast. In doing so, the Government accepted responsibility in being both a landowner (DOC - pest control) and an infrastructural manager (Transit NZ - State Highway 25) to play its part in assisting EW, TCDC and more importantly the five Thames Coast communities address the flooding issues head on.

The Government viewed our integrated plan as being the key tool in lowering the high risks to life, while establishing a sustainable foundation for these communities over the longer term.

The Business Case would not have been successful if EW, TCDC and the five communities had not made concessions and sacrifices in accepting its share of the costs. The success of this project was also largely due to Central, Regional and Local Government developing a partnership to work together with communities to address a problem. This project has no doubt set the benchmark for future cases, whether they be within or outside the Waikato Region.

***“The government announced today that it will be contributing a multi-million dollar package to an integrated flood management plan for the Thames Coast”.***  
*Ministry of CDEM press release, 22 Sept 2004.*

## **What would we do differently?**

Be more realistic about the timeframes - perhaps pick off the two priority communities first and spread the rest out over a few more years (so that we could really do them well and in a shorter timeframe, take the communities with us more and learn from them before moving onto the next ones).

Retain greater control over the working parties initially – EW chair them for the first year for example. They have worked really well where there has been strong rational leadership.

## **Adaptability/Transferability**

In terms of river flood and catchment management, the issues facing the Coromandel are no different than in many other parts of New Zealand. There are no doubt other catchments across the country exhibiting similar characteristics, such as high intensity rainfall, steep/short river systems, unstable slopes and damage caused by animal pests.

We believe our approach to this project has been revolutionary resulting in good long term outcomes which could quite easily be applied by other Councils/Agencies. The preconditions to watch out for which may indicate that such an approach is warranted include unstable catchments, channel infilling (sedimentation, debris flows etc), high risk to life and property, frequent and increasing magnitude of flood events, and changing rainfall trends.

## **Conclusions/Successes**

The Weather Bomb event of June 2002 was a significant event for the Coromandel, particularly the Thames Coast. It ultimately led to the establishment of a broader (longer term) integrated and inter-agency catchment management programme known as the Peninsula Project.

While we are only part way through implementing this 20 year programme, we are making excellent progress in achieving our long term goal of healthy, stable catchments and reduced risks to life and property. These gains have been achieved through:

- A commitment from Central Government who are actively supporting our approach (through their responsibilities in pest management, roading and emergency management)
- A catchment wide river and stream maintenance programme that aims to improve the stability of river channels
- Increasing biodiversity and health of the catchment and river systems across the peninsula
- Flow-on effects to other projects (through establish relationships and sound processes)
- Provision of information and advice in the current review of the

#### Thames Coromandel District Plan

- Establishing good working relationships and cooperation between agencies
- A well informed community that now better understands the issues enabling them to be involved in the decision making process.

Due to the cooperation of agencies and the agreed work programme which is now in place, the communities on the Coromandel Peninsula are now beginning to see the benefits from having healthier, more stable catchments such as reduced costs and lower risks.

#### **Contacts for Further Information**

Name: Scott Fowlds  
Title: Group Manager, River and Catchment Services  
Local Authority: Environment Waikato  
Street Address: 401 Grey Street, Hamilton East  
Postal Address: PO Box 4010 Hamilton East  
Phone: (07) 859 0999  
Fax: (07) 859 0998  
Email: [scott.fowlds@ew.govt.nz](mailto:scott.fowlds@ew.govt.nz)

Name: Julie Beaufill  
Title: Programme Manager, Coromandel Zone  
Local Authority: Environment Waikato  
Street Address: 33-35 Albert Street, Whitianga  
Postal Address: PO Box 192, Whitianga  
Phone: (07) 866 0172  
Fax: (07) 866 0173  
Email: [julie.beaufill@ew.govt.nz](mailto:julie.beaufill@ew.govt.nz)