

## Total Catchment Management

### What is TCM?

Institutions charged with the management of natural resources are increasingly coming under pressure to change their management approach. One concept which has gained credibility over the past decade is total catchment management. It is a process through which people can develop a vision, agree on shared values and behaviours, make informed decisions and act together to manage the natural resources of their catchment by considering the effect of the use of land, water and other environmental resources on all people within the catchment.

It is an approach to sustainable resource management from a catchment perspective in contrast to a piecemeal approach that artificially separates land management from water management. Ecosystems are recognised and there is a focus to understand the role of the ecosystems as habitat for flora and fauna. TCM seeks to take into account complex relationships within those ecosystems for example between flora and fauna, between geology and hydrology, soils and the biosphere and between the biosphere and the atmosphere.

Such an approach is reinforced by the Local Government Act (2002) which “provides for local authorities to play a broad role in promoting the social, economic, environmental, and cultural well-being of their communities, taking a sustainable development approach.” It is a vehicle to facilitate a key council responsibility of promoting the sustainable management of the region’s natural and physical resources for overall community wellbeing. It reflects a change in emphasis in the way that Greater Wellington approaches its work.

### The big picture

The way GW manages the region's natural resources has a fundamental bearing on the sustainability of the region. This is the cumulative impact of the way we live. Our use and consumption of natural resources and the disposal of our waste place pressures on the local environment. We also have an impact on the global environment, which supplies much of our food, fuel, cars and household goods

We are avid consumers; expenditure on household goods has underpinned much of the strength in the economy in the last decade. We are not particularly efficient in our use of water and in parts of the region the limits of what can be allocated are being reached. We are passionate about our native bush, landscapes, and beaches but have contributed to a massive decline in biodiversity and introduced thousands of exotic species, some of which have developed into expensive ecological pests (e.g., cats, goats, possums, old man’s beard).

The environmental impact of this way of life can be described as our “ecological footprint” – usually calculated as the amount of land needed to provide for an individual or country’s needs. Unfortunately, we are not treading lightly. At 5.9 hectares, New Zealand has the eighth highest per capita footprint in the world. We sit just below countries like Australia, Canada, and America, which share our economic characteristics of affluence and consumption. We are well above the world average of 2.23 ha. Wellington region’s footprint exceeds its available land area by 40% - the fourth largest footprint in the nation.

Economic growth creates our standard of living and underpins our quality of life. It is essential to fund community and public services, health care, education, and so on. However, if economic growth can be “decoupled” from its environmental impacts it will make a much greater contribution to our overall sustainability. This is achievable but it requires a new policy mix and perhaps a different set of attitudes.

There are sound economic reasons why moving in this direction is a good idea. New Zealand has an export oriented free market economy which competes to sell its products in the global market place. Many of these exports are generated by industries based on natural resources – farming, horticulture, fishing, forestry, and aquaculture. The country also has a buoyant tourism sector which relies on healthy, unpolluted ecosystems and stunning biodiversity for its image and the experience offered. We have long described New Zealand as “clean and green”; it has become the nation’s underlying brand. The health of the environment gives our exports their competitive advantage and is a critical factor in gaining market access.

With climate change and a growing environmental awareness impacting on the buying behaviour of overseas consumers, there is an even greater need for our products to be made and transported to the market place in a low-carbon, non-polluting manner. Products that meet these tests will be favoured by consumers. A more environmentally sustainable Wellington region will also add to its appeal as a desirable place to live and work in the competition for workers in a shrinking labour force.

A change to a TCM approach to the management of our natural resources will provide opportunities to assist in the reduction of GW’s carbon footprint.

### **What is sustainability?**

The purpose of the Resource Management Act 1991 is to promote the sustainable management of natural and physical resources. The Act’s definition encapsulates the central idea of environmental sustainability - natural resources can be used and developed for people and communities to provide for their material wellbeing, but in a way that ensures resources and ecological systems retain their life-supporting capacity and are not overly degraded.

Internationally, recognition and understanding of the importance of the life supporting capacity of ecosystems (included in the New Zealand Act in subsection 5(b)) has grown hugely in recent years. As the world’s population heads towards 7 billion and the realities of climate change have become more certain, the “carrying capacity” of the planet - the

ability of its air, water, soil, and ecosystems to sustain life - has come into sharper relief. Scientific attention has been focused on the consequences for human society of the deterioration in the “services” provided by ecosystems. These include the provision of clean air and water, the conversion of the sun’s energy into useable biomass (trees, crops), changing carbon dioxide to oxygen, breaking down and absorbing wastes, cycling nutrients, creating and maintaining soils, providing pollination and pest control, and regulating the climate. Ecosystems provide the food we eat, timber for our housing, raw materials for industry and fibre for our materials and clothing.

As more and more examples of the global environment’s inability to absorb human impacts have occurred (e.g., climate change, fires, intense storms, drought, declines in fish stocks, polluted water bodies), there has been a sea change in the way people conceive of the notion of sustainability. To be sustainable now requires we develop an understanding of the biophysical limits inherent in the natural environment and find ways to live within them so that the essential services they provide are not undermined.

How close to these limits is the region we live in? This is difficult to judge. Many of the region’s rivers and streams are under serious pressure and large areas have fragile soils susceptible to erosion. Our lowland ecosystems are depauperate but the landscape is still green and the ‘collapse’ of ecosystems seems highly unlikely. Most of the region is free of air pollution but our emissions are contributing, if only in a very small way, to changes in the global climate. Some define sustainability as a community’s ecological footprint being less than its land area. The fact that it takes 1.4 times the region’s available land to supply our needs suggests we may not be sustainable. In summary we are probably ‘sustainable’ on some measures, but not on others, and on still more we do not have the information to say. There is no immediate crisis however as it is unclear where the limits lie. Now is the time to act so we avoid future crisis.

### **Why change?**

As outlined above the greater Wellington region ecological footprint exceeds its land area. GW has recently committed considerable funds to improving the transport system in the region so there is a requirement to deliver more without increased resources. We as a community produce a myriad of plans and strategies to cover varying aspects of catchment management e.g.

- Regional Policy Statement
- District plans
- Regional Plans e.g. freshwater, discharges to land, air, and soil plans
- Department of Conservation Management plans varying from site specific plans at a locality such as Lake Wairarapa to region wide assessments on biodiversity.
- Animal Health Board TB Control Strategy
- Regional Pest Management Strategy.

- Flood plain management plans
- Wellington Regional Strategy
- Iwi plans
- Fonterra Accord and other industry codes of practise
- Farm plans
- Sustainability plans
- Shelter plans
- Riparian management plans
- Biodiversity plans.
- Action plans varying from biodiversity, wetlands, rivers
- Wairarapa coastal strategy
- Regional water strategy
- Policies on managing and assisting private land owners and public land owners.
- Transport plans e.g. development of a mainland port.
- Health Board plans
- Parks and Recreational plans
- Emergency Management plans

Such a list suggests there is probably a lot of duplication. TCM by involving all the stakeholders presents an opportunity to make some efficiency gains.

Our current approach to catchment management in the broadest sense is primarily functional. We have separate (and unaligned) processes, in the main, for identifying pressures on the environment and for developing and implementing measures to address them. The regional plans water activities etc are grouped and are subject to the same process. Consultation processes can vary. Linkage of land use to water management has been problematic to date. Partial integration has only occurred when there has been a several issues identified for the same catchment e.g. Waiwhetu stream. The integration has occurred after the identification of common issues resulting from a functionally-based analysis of pressure, state and response rather than at the beginning of the process where there is the possibility of completing an integrated analysis of the pressure and state and identifying integrated solutions.

Topics such as climate change again are being dealt with functionally. Yet climate change has the potential to;

- Alter maximum and minimum flows in water bodies
- Change the dynamics of the river channel
- Cause changes in sediment input

All of these changes will have an effect on the ecological quality of water bodies. TCM will enable an integrated approach to developing climate change policy to be used in the strategic planning of water resources, flood risk management, land management, pest management, biodiversity and water quality.

By involving the community and the various stakeholders early in the process there is the opportunity to create and develop partnerships. These partnerships have the potential to develop the joint ownership of natural resources management within a specific catchment. This is likely to result in increased commitment of those responsible for completing actions. There is the opportunity for greater recognition that an action in one area within a catchment may impact on another area within the same catchment e.g. better joined up thinking.

Catchment management is the management of complex relationships. Again by involving all parties early in the process and harmonising objectives, time scales and participation processes we will all be better able to understand the key sustainable development issues within the catchment. Timely decision making will result in improved prioritisation of actions.

In summary TCM will ensure sustainable development occurs, create a vibrant environment for people and wildlife and integrate the management of land and water by being strategic:

- Involving and listening to the community
- Implementing an integrated long term approach to catchment management
- Working closely with our partners and providing increasing opportunity for stakeholder involvement
- Aiming to achieve environmental, cultural, social and economic benefits concurrently
- Directing limited resources to where they will bring about the greatest benefit.

## **Guiding Principles for Total Catchment Management**

The following principles will be used to achieve a total catchment management approach;

- Community led process which encourages active and early involvement of a broad group of stakeholders from within the studied catchment.
- Focus at a catchment level noting that in large catchments some planning may be required at a sub-catchment level. Large catchments can be determined by size, diversity of communities and/or complexity of issues.
- Set out a clear and transparent process of analysis and decision-making.
- Integrate and streamline plans and processes e.g. WRS, RPS, District Plans, Regional Plans, Floodplain and DOC management plans
- Work in partnership with other regulators.
- Take an ecosystem approach to resolving the issues.
- Only use regulation when it is necessary and in a way which is proportionate to the risk being addressed.
- Develop objectives to deliver sustainable development which consider environmental, cultural, social and economic priorities and prioritise action over successive planning cycles.
- Take a balanced approach across different sectors of society and sectors of industry.
- Strive to be even handed and transparent in the management of uncertainty.
- Develop methodologies and refine analyses as more information becomes available.

## **Implementation of TCM**

Three work streams are seen as necessary to implement TCM, as follows;

1. At the governance level,
2. At the operational level building how we will work to break down the silo mentality.
3. A pilot project.

### Governance Level

The Regional Policy statement has included total catchment management as a method. This approach needs to cascade down into any new plans.

There is also the opportunity when considering new projects through the LTCCP process to weight support for projects delivered in alignment with the TCM principles e.g. regional water strategy, land management, biodiversity initiatives or the Wairarapa irrigation project.

Co management of projects offers the opportunities to both broaden the involvement of stakeholders and may also result in identifying other funders, e.g. Lake Wairarapa.

Some basic training in ecosystems may be appropriate.

### Operational level

Staff often currently work in vacuums. They are unaware of projects or work streams which might be of benefit to them. The biodiversity groupings have been the first attempt to create forums where staff interested in a specific work stream such as rivers or wetlands meet on a regular basis. Their success has been patchy to date.

Staff have not always had the time to commit to the meetings. Once a policy has for example been developed and initiated the motivation of the individual members of the group has varied. The goals/objectives of the groups have not always been clear. Perhaps this shows that we are good at developing policy and implementing it but are not so good at either being strategic nor inclusive in both explaining what we do, communicating the results of what we are doing and knowing what data is available from a specific area of study. As a result of inadequate information sharing opportunities to make a difference are being lost by both staff and politicians e.g. the Mangatarere River which has slipped down the water quality rankings despite starting close to 50<sup>th</sup> in the initial surveys.

With the development of our Geographic Information System within GW it is possible to obtain, store and use data in ways which could only dreamed of in the recent past. Models of sediment generation for example can assist GW to target its land management activities to the areas of greatest need. The Land Environment New Zealand data base similarly can be of assistance in biosecurity and biodiversity projects. The recently developed groundwater model will be used to understand the relationship between rivers and groundwater levels and, groundwater levels and water levels in springs and wetlands.

The key to making a change is to ensure staff are aware of the data available within the databases within GW. This requires training and the exchange of knowledge. To achieve this it is proposed that field staff operating on private land, in the first instance, will be given training initially in ecosystems followed by training in topics such as, biosecurity, biodiversity, iwi matters, land and water management and the use of the GIS. The approach will be trialled using an ecosystem approach to biodiversity.

Work has already commenced on developing a training module. The training will be similar to that which should be given to new staff joining the organization. Thus these field staff will be both generalists and specialists. They will have their field of expertise and be able to assist land owners with the identification of other issues without providing technical advice outside their area of expertise. Specialists will provide the technical advice as required. Currently there is funding available for corporate training. The proposed training could fall within the scope of corporate training.

Prior to going out into the field staff will be expected to collate all the available information for a particular property. This could be in the form of maps or stored within a “notebook” laptop. A desired outcome for example is the identification of wetlands which could be restored or biodiversity values which might be worthy of protection.

As well as training it is proposed that a field staff forum be created which would meet twice a year. Such forums would discuss the results of recent research/issues with the objective of keeping staff up to date with what is happening within GW. There is also an opportunity to develop and implement specific action plans. A broadsheet could also be prepared on an as required basis.

In addition the issue of climate change and the impact of severe storm events has reinforced linkages, e.g. between lack of tree cover and highly erosion prone land, stimulating central government to produce new policy initiatives. Shortly national policy statements are likely to be released for submission on Flood Risk and Fresh Water Management. These new initiatives are built around the total catchment approach and offer opportunities for GW to secure additional funding from central government e.g. the Hill Country Erosion Fund and the Afforestation Grant Scheme

To date land management issues have not always focussed on the impact of sediment on fresh water systems, be it the silting up of river channels reducing flood capacity, destroying habitat or reducing the productive capacity of the land. The high sediment load of our rivers is likely to be having a significant effect on inshore fisheries. This highlights the need to step back and look at all the linkages within our natural systems.

#### Pilot project

GW needs to trial the TCM approach. This will enable council to assess the ability of such an approach to develop the benefits suggested. There will be challenges such as managing a multi skilled group outside of their departments and developing and maintaining partnerships with key stakeholders. Such an approach was tried on the Hutt River in the late 80’s and did not deliver. It appears in hindsight that the project became too big with the result that not enough resources were available to complete the project.

Potential trial catchments are;

- Waikanae River
- Pauatahanui Stream
- Mangatarere River

On selection a three year trial would commence. There is a strong possibility that Massey University would wish to participate in the pilot. Professor Russ Tillman has indicated an interest in total catchment management for a number of years. One of his students has just completed a resource inventory for the Ruamahanga River catchment. The university would probably be able to assist in providing economic analysis for example.

The first 4-6months would advertise and promote the project and establish a local steering committee that would gain an initial understanding of the catchment management issues and develop the process. The local committee would be supported by a working party of staff of local authorities and interested stakeholders. By 12months the main pressures and impacts within the catchment would be identified along with a set of economic, environmental, cultural and social objectives. A summary of the significant issues and a high level strategic assessment including possible scenarios for consideration will also be completed.

After 24-30 months different scenarios will have been studied including an analysis of their cost effectiveness and possible alternatives. A draft TCM plan would be prepared.

At the end of three years the draft TCM plan will be reviewed and the final scenarios and objectives decided. The TCM plan would then be implemented.

The role of the steering committee will be to make data available, have regular meetings with key stakeholders and formally consult with the general public. It will push for more efficient use of both resources and those of the stakeholders. In direct negotiations between different interest groups the committee will facilitate these negotiations. Producing a realistic and achievable TCM plan will have a high priority.

It is likely that the plan will require significant shifts in practise for some parties. This will involve the achievement of best industrial practise, may require different approaches between the rural and urban areas, and change in public behaviour. Regulation will only be used when absolutely necessary.