



Northern Hawke's Bay Sustainable Land Management Strategy

Options Paper

Report prepared by Sean Weaver, Ekos,
for the Hawkes Bay Regional Council and the
Ministry for Primary Industries

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About the Author

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Terms Of Reference

The consultant was contracted to undertake the following:

Consult with local, regional and national stakeholders to explore options to address acute soil erosion in both a forestry and pastoral context for Northern Hawke's Bay. This will include scoping potential piloting approaches for broader application. The chronic and pervasive sustainable land management issues in the Wairoa District will require deeper, longer-term thinking, which the HBRC is working on in parallel and will have an emphasis on social process to influence land use decision making over time.

The consultant's role is to identify options and recommended priority actions for HBRC and MPI, in working with local stakeholders, to address the most serious near term contribution to degraded water quality. This will be executed by a close examination of immediate pressures and catchment hot spots that require action in the very near term, which can be seen as indicators of problems that a broader strategy will need to address.

The consulting report will focus on these immediate priorities, with a view to addressing them in a manner that will fit within a broader strategy for matching land use with land use capability over time.

The consultant is required to identify priorities for HBRC and MPI to focus its efforts in the near term, if more resources were to be made available, and identify potential benefits, costs, risks and opportunities that would be aligned with such an approach. This will include exploring how a pilot initiative could be designed to deliver a proof-of-concept and demonstration activity for potentially scaling up in the implementation of a broader strategy to address this regional problem.

Executive Summary

Acute soil erosion and nutrient loads in rivers are seriously degrading water quality in Northern Hawke's Bay and is resulting from land use that is incompatible with land use capability. This Options Paper presents a concept note on a sustainable land management strategy for Northern Hawke's Bay.

Conceptual Framework: Ecological Infrastructure

Human wellbeing depends on a combination of economic and natural capital in any given area. The eroding steep-lands of the Wairoa District are eroding the natural capital of northern Hawke's Bay, as a result of land use that is not compatible with land use capability.

Accordingly, there is a compelling need to reduce erosion and water quality degradation risk in the Wairoa District through targeted investments in "ecological infrastructure" capable of delivering the desired sustainable land management outcomes. Like engineering infrastructure, ecological infrastructure delivers beneficial services to human wellbeing ("ecosystem services") such as water quality and reduced flood risk (and associated cost). Like engineering infrastructure, ecological infrastructure can continue to deliver its services only when there has been sufficient investment in maintenance.

Integrated Approach

Effectively delivering this upgrade requires an integrated approach to a multifaceted problem - akin to a three-legged stool. The legs:

1. Financial Incentives (carrot)
2. Regulatory Refinement (stick)
3. Community Engagement (modality)

The goal is to create a dynamic synergy between incentives (carrots) and regulation (sticks) to generate an efficient outcome that poses low political risk to central and local government actors, and yet is capable of driving real behavior change at scale, to measurably reduce risk and enhance human well-being in northern Hawke's Bay and beyond.

An integrated approach will deliver more durable outcomes than cherry-picking certain components in isolation. It is strongly recommended to preserve the integrity of integration by means of a fully integrated pilot project, followed by refinement and scaling up to a wider area in the following stages:

- Stage 1: Detailed design and consultation (6-months)
- Stage 2: Pilot Project (1-2 years)
- Stage 3: Scale Up (multi-year roll-out)

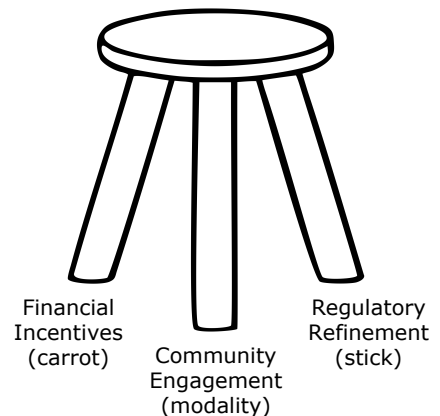
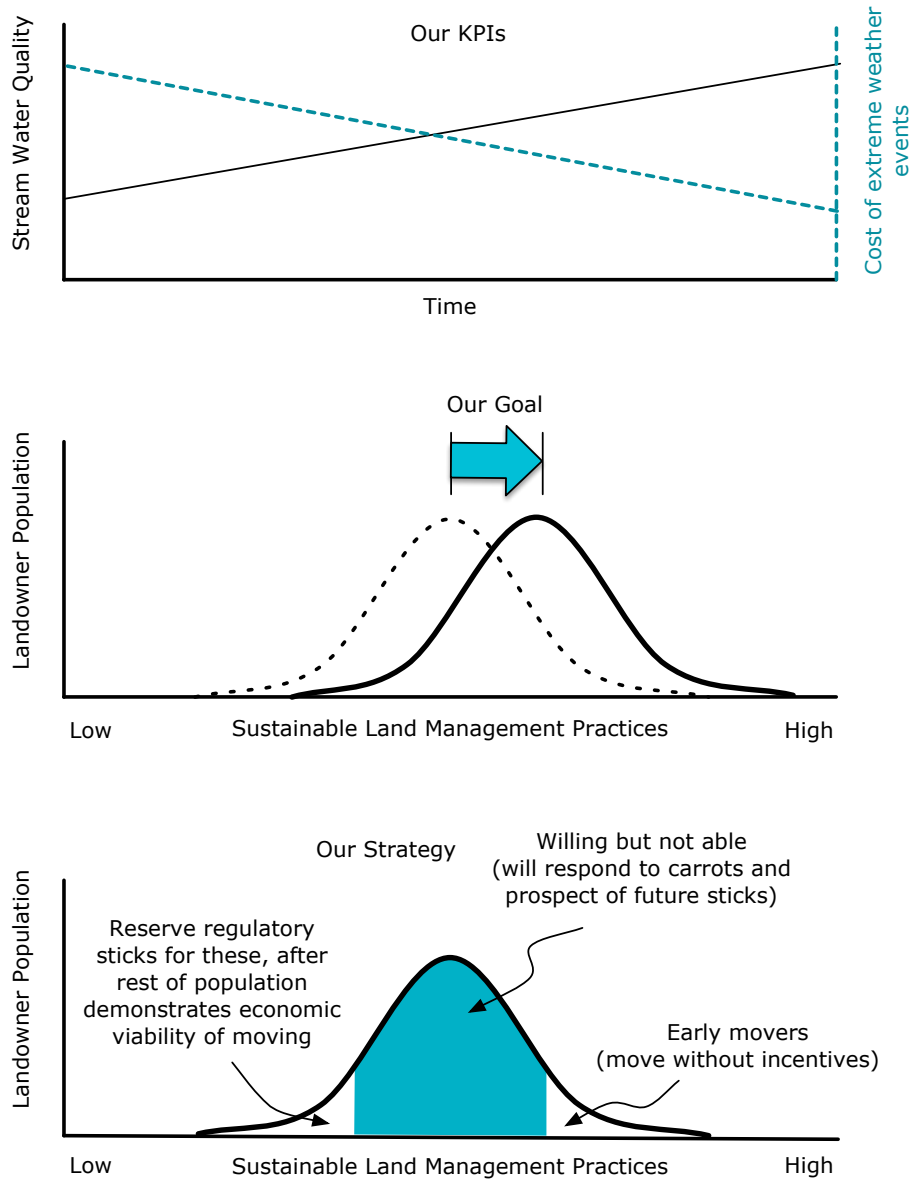


Figure 1. Concept diagram of strategic approach



Priorities For Action

Priorities for Hawke’s Bay Regional Council (HBRC) and the Ministry for Primary Industries (MPI) to consider in the near term include:

Community Engagement

1. **Partnership with Iwi:** MPI, HBRC, and the Wairoa District Council to continue to consult with iwi groups as an integral component of a sub-regional erosion control programme, with a view to exploring the leadership role that iwi can play in such a programme in partnership with central and local government.

2. **Upgrade Catchment Groups:** Hawke’s Bay Regional Council and MPI collaborate on defining targeted outcomes to be allocated/devolved to the catchment group sector in the Wairoa District as a component of a wider erosion control programme. Consult with those with experience in this sector to scope budgets for a) paid coordinators, b) contractors, c) volunteers, d) community consultation, and e) operational expenses (e.g. nurseries). Price budget lines sufficiently to cover the real cost to deliver targeted outcomes. Concurrently explore a co-financing model that engages funding from HBRC, MPI, philanthropy, and landowners with MPI/HBRC funding disbursed via a contestable grant. Then recruit catchment group/s to implement funded project/s. MPI and/or HBRC to allocate funding for the development of catchment group management tools (e.g. business management; performance measurement & reporting) to enable recruited catchment group/s to perform at a professional level of short, medium and long term outcome delivery.
3. **Wairoa Work Readiness Programme:** HBRC and MPI to coordinate the development of a Work Readiness Programme aimed at supplying a local (i.e. Wairoa) labour force for an integrated erosion control programme. HBRC and MPI to consult with the plantation forest sector, manuka honey sector, horticulture, agriculture, and catchment group sectors, the Ministry for Social Development, Ministry of Education, and the Wairoa District Council.

Regulatory Refinement

4. **Plantation Forestry Controls:** The National Environmental Standard for Plantation Forestry is yet to be released and may contain provisions that cover this section – so replication is a possibility. Nonetheless, it is recommended that HBRC develop/refine regulations requiring forestry operators in Northern Hawke’s Bay to be required to demonstrate:
 - Forestry road and river crossing engineering practices that minimize soil erosion risk.
 - Harvesting and re-planting design schedules (combined with road construction/maintenance plans) to enable a significant proportion of large plantation forestry catchments to be under forest cover at any one time. The details should be developed in close consultation with best practice players in the forestry industry.
 - Participation in public liability insurance (or equivalent) programme for rapid removal of forestry slash following high rainfall events.

HBRC to consult with the plantation forest industry in Hawke’s Bay to determine the most publically beneficial model for a public liability financing programme for rapid removal of forestry slash following high rainfall events. Options include a requirement for plantation forestry companies to a) self-insure for this form of public liability risk, b) take on public liability insurance either individually or as a sub-regional (i.e. Northern Hawke’s Bay) syndicate through a suitable insurance broker, or c) contribute to a public liability financing programme operated by the Hawke’s Bay Regional Council or subcontracted entity that generates financing co-benefits for social forestry in the Wairoa District.

5. **HBRC Policy Review:** HBRC to undertake a policy review of potential regulatory measures available for local implementation of the National Policy Statement on Freshwater Management 2014 combined with a voluntary incentive programme for strategic erosion control for Northern Hawke’s Bay. The purpose of such forthcoming regulation¹ is to a) send a behaviour change signal to private

¹ E.g. Coming into force 8 years after launching incentive mechanisms. Why 8 years? Long enough to not cause panic, but short enough to motivate farmers to get on with accessing incentives to avoid future regulation.

land managers to respond to opportunities to change behaviour through access to incentive mechanisms during a regulatory holiday window, and b) to implement command-and-control measures after a regulatory holiday window to cause required behaviour change that has not yet happened (e.g. compulsory retirement from grazing of lands classified as 'High Landslide risk – delivery to streams').

Financial Incentives

6. **Erosion Control Afforestation Scheme:** Establish a pilot Erosion Control Afforestation Scheme (ECAS) initially limited to the Whakaki Catchment, to test and refine an incentive mechanism for the retirement and afforestation of lands classified as “High Landslide Risk – delivery to stream”. Finance the ECAS by establishing a ring-fenced portion of the Afforestation Grant Scheme, combined with a ring-fenced portion of the East Coast Forestry Project (ECPF) funding and allocate to a special ECAS Fund. The ECAS Fund to be justified (i.e. defended against criticism from other regions) on the basis of a) the special (long running) erosion and water quality degradation circumstances in the Wairoa District in general and the Whakaki catchment in particular, and b) the need for a pilot project to test this particular funding mechanism without having to change the entire AGS and the ECPF, and c) where the outcome of this pilot project could lead to redesigning the AGS and ECPF in a way that could benefit other regions. The ECAS to adopt disbursement rules specified in Section 3.6 of this Options Paper. If proven effective, the ECAS could be scaled up to target high erosion risk lands across a wider area in Hawke’s Bay and potentially nation-wide.
7. **Complementary Measures:** Establish a consultation process with farmers and iwi in the Wairoa District, Business Hawke’s Bay, manuka honey operators, horticultural operators, sheep dairy operators, MPI, and HBRC to scope out realistic support that the Crown could provide in a Rural Productivity Innovation Programme. Such a programme could function through a) Crown investment support for key enabling infrastructure, to stimulate private sector investment, and b) advisory support for farmers seeking to transition to more sustainable farm productivity innovations. Here access to advisory support is reserved for farmers who have already participated in the ECAS and the support for farmers functions as a reward for moving in a strategically desirable direction. Scoping the form of advisory support could be undertaken by means of a Wairoa District Sustainable Farming Innovation Workshop to bring together stakeholders in pastoral farming, manuka honey, horticulture, sheep dairy operators, biological farming, and iwi.

Climate Change Policy: HBRC, and the Wairoa District Council make a joint recommendation to the Minister for Climate Change on how the next version of the New Zealand Emissions Trading Scheme could function as an effective supporting infrastructure for erosion control. These entities could recommend that mechanisms be investigated to ensure that the carbon price for targeted erosion control afforestation is sufficient to stimulate such afforestation (e.g. \$20-\$25/tCO₂e in the near term). This could include an underwriting mechanism for afforestation activities under the ECAS.

8. **Sustainable Farming:** HBRC to fund a Wairoa District Sustainable Farming Programme that includes a desktop review of sustainable farming science and economics, a multi-stakeholder Wairoa Sustainable Farming Innovation Workshop to identify ways to support local farmers in a transition to more sustainable farming practices.

Integrated Pilot Project

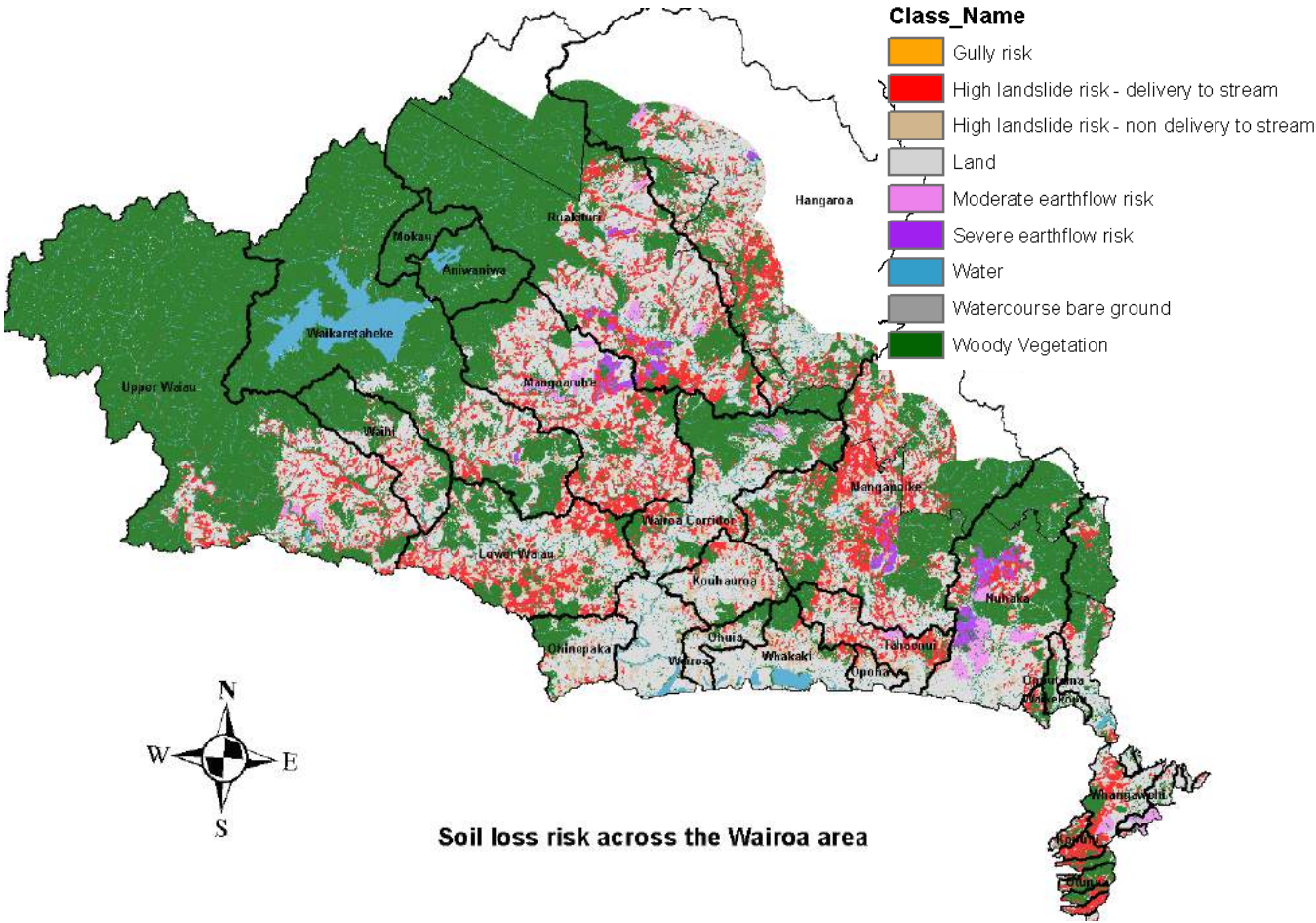
9. **Whakaki Ecological Infrastructure Project:** MPI and HBRC to fund the establishment of the Whakaki Ecological Infrastructure Project. This could involve funding the development of a Project Design Framework for presentation at a Multi-Stakeholder Project Design Workshop. MPI and HBRC to also fund the subsequent development of Final Project Design for presentation of an MPI-funded Project Launch event. The Final Project Design would contain a budget and funding requirements from different funding sources, including co-financing by a range of government entities and the private sector.

1. Problem: Erosion & Water Quality

1.1 THE STATE OF EROSION IN THE WAIROA DISTRICT

Soil erosion has contributed to declining water quality in Northern Hawke’s Bay for decades, with underperformance of erosion control and water quality improvement outcomes. According to Hawke’s Bay Regional Council, approximately 34% (47,000 ha) of farmland in Northern Hawke’s Bay (Mahia, Nuhaka and Wairoa catchments) is classified as ‘high landslide risk’.

Figure 1. Soil erosion risk map, Northern Hawke’s Bay.



Actions to improve water quality need an upgrade in scale and scope if water quality decline is to be reversed for the benefit of the regional economy. Steep pastoral farmland contributes to an on-going suspended stream sediment yield that is typically 3-4 times higher than equivalent streams flowing through plantation forests. Sediment yields from plantation forest may be lower than pastoral farmland for most of the timber rotation, but spikes to around 3 times the sediment yields from pastoral farming

during harvesting, even under best practice. Furthermore, there is a “wall of wood” projected to be harvested from plantation forestry lands in this sub-region in coming years. This significantly increases the potential risk of harvest-linked soil erosion, associated stream sediment loads and downstream damage from forestry slash if appropriate mitigation measures are not put in place ahead of time.

Stream water quality is also detrimentally affected by chemical degradation resulting from fertilizer runoff into streams (e.g. phosphorus). Resulting high nutrient content in fresh water causes rapid algal growth, then leading to algal death and decomposition, starving a waterway from oxygen. This causes the freshwater habitat to degrade, leading to reduction in macro-invertebrate food sources for fish, leading to slower fish growth, and reduction in the recreational fishing and amenity value of streams and rivers.

Degradation of stream water quality has a knock-on effect on estuarine and inshore marine environments. A recent review of the Hawke’s Bay coastal environment showed a decline in the condition of rivers and estuaries in the region with 40% of river-mouth and estuary areas classified as Moderately Polluted and in a worse condition than in 1965. This is coupled by increased sedimentation throughout rivers and estuarine systems in the region.

Clearly, reducing soil erosion and improving water quality in Northern Hawke’s Bay is a task for both pastoral farmers and plantation foresters. Water quality decline is also a symptom of lost economic opportunities for sustainable land management to drive sub-regional economic performance. Impediments to sub-regional rural economic performance include:

- Misalignment of land use with land use capability, with particular regard to erosion-prone hill country pastoral farming.
- Under-developed human resources in the local labour force, particularly in Wairoa.
- Lack of supply, and shortage of demand side infrastructure components capable of unlocking the potential for complementary industries (e.g. manuka honey, horticulture, aquaculture, sheep dairy, farm forestry), as well as more sustainable forms of existing beef and lamb farming.
- Insufficient risk management and risk mitigation protocols for forestry slash.

In short, solving the sub-regional erosion problem is linked to solving the rural economic development challenge in a way that is compatible with the physical landscape and waterways.

1.2 LOCAL CONTEXT

The Hawke’s Bay Regional Council (HBRC) seeks to reduce the sediment (including forestry slash) and nutrient loads in Northern Hawke’s Bay waterways in line with local application of the National Policy Statement on Freshwater Management, and the National Environmental Standard for Plantation Forestry.

Business-as-usual land management on erosion-prone hill country in Northern Hawke’s Bay has thus far failed to adequately address the water quality problem, due primarily to land use practices that are incompatible with land use capability for many steep land sites. The Hawke’s Bay Regional Council has concluded that a more comprehensive approach to strategically addressing this problem is now needed – hence this “Options Paper”. This multi-faceted problem requires an integrated solution that has the net effect of measurably enhancing water quality in line with local implementation of the National Policy Statement on Freshwater Management. Other key performance indicators in an integrated solution

include direct measurable economic growth and social improvement, in a manner directly aligned with activities that improve water quality and reduce flood risk.

Strategic realignment of land use with land use capability will need to include a combination of targeted land use change (non-forest to forest land use) and land use improvements focusing on high risk land classes.

2. Solution Framework

2.1 ECOLOGICAL INFRASTRUCTURE INVESTMENT

Human wellbeing depends on a combination of economic and natural capital in any given area. When either erodes, so too does the prospect for human wellbeing in that area. The eroding steep-lands of the Wairoa District are eroding the natural capital of northern Hawke’s Bay, as a result of land use that is not compatible with land use capability. This is increasing the risk of flood damage and water quality degradation, that in turn poses a threat to the region’s prosperity. When the physical impact of flood events increases, the cost to the regional economy also increases in the form of flood damage to downstream property and infrastructure, and loss of productivity both upstream and downstream. When freshwater and inshore marine water quality declines, the prosperity of industries dependent on such water resources also declines – e.g. fisheries and tourism.

Accordingly, there is a compelling need to reduce erosion and water quality degradation risk in the Wairoa District through targeted investments in “ecological infrastructure” capable of delivering the desired sustainable land management outcomes. Examples of beneficial ecological infrastructure in the Wairoa District include a) steep hill country covered in permanent forest; b) rivers, lakes and lagoons that have fenced permanent forest on their margins, c) pasture that does not deliver high volumes of nutrient and sediment to streams.

Like engineering infrastructure, ecological infrastructure delivers beneficial services to human wellbeing. These services are called “ecosystem services” and include water quality and reduced flood risk (and associated cost). Like engineering infrastructure, ecological infrastructure can continue to deliver its services only when there has been sufficient investment in maintenance. From an ecological infrastructure point of view, the hill country of the northern Hawke’s Bay is something like a dilapidated bridge and is in dire need of an upgrade.

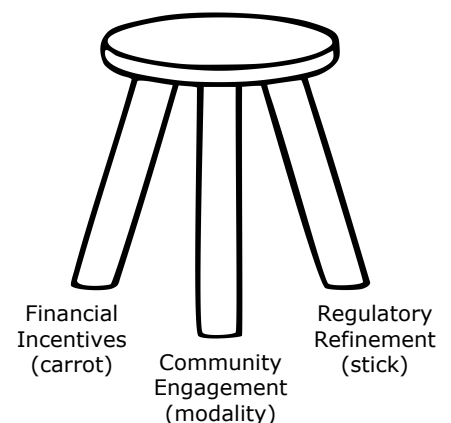
2.2 AN INTEGRATED APPROACH

Effectively delivering this upgrade requires an integrated approach to a multifaceted problem. If the problem were not multifaceted, efforts over the last few decades would have resolved it by now. Lessons learned during that time inform the current integrated approach - akin to a three-legged stool. The legs:

1. Financial Incentives (carrot)
2. Regulatory Refinement (stick)
3. Community Engagement (modality)

Remove a leg and it loses effectiveness.

The core strategic message is that an integrated approach will deliver more durable outcomes than cherry-picking certain components in isolation. In order to reduce financial risk to funding entities, it is strongly recommended to preserve the integrity of integration by means of a fully integrated pilot project, followed by refinement and scaling up to a wider area in the following stages:



Stage 1: Detailed design and consultation (6-months)

Stage 2: Pilot Project (1-2 years)

Stage 3: Scale Up (multi-year roll-out)

Some components of a pilot project (e.g. regulatory refinement) will have near-term impact across a wider geographical area in a no-regrets manner. Concurrently, specific actions in a defined catchment (e.g. Whakaki catchment east of Wairoa) will enable the methodology of an integrated approach to be refined prior to wider application, whilst making real progress on the ground from the outset.

2.3 INTEGRATED PROGRAMME OF ACTIVITIES

This integrated approach brings together a range of components that in aggregate are capable of causing measurable beneficial change to land management in the Wairoa District. The components are:

Community Engagement

1. Partnership with iwi.
2. Upgrade catchment groups.
3. Wairoa Work Readiness Programme.

Regulatory Refinement

4. Plantation forestry controls relating to erosion control.
5. HBRC Policy Review.

Financial Incentives

6. Erosion Control Afforestation Scheme.
7. Complementary measures.
8. Sustainable farming.

Integrated Pilot Project

9. Whakaki Ecological Infrastructure Project

3. Specific Recommendations

3.1 PARTNERSHIP WITH IWI

In May 2016 Te Tira Whakaemi o Te Wairoa signed its deed of settlement for a \$100 million Treaty of Waitangi claim, which now proceeds through ratification by local iwi and hapū. Iwi and hapū in the Wairoa District will accordingly play a central role in sustainable land management in the Northern Hawke's Bay. This includes existing and potential roles pastoral farming, plantation forestry, horticulture, honey, aquaculture, agribusiness, erosion control, as well as an upgraded catchment group sector.

The long-term economic development horizon of many iwi land management groups is deeply compatible with a sustainable land management agenda for the region, and Māori will very likely play a strong leadership role in partnership with the Crown and local government. It is important that a strategic approach to erosion control and water quality improvement in Northern Hawke's Bay is developed in close collaboration with iwi groups. Such partnership and co-management has shown to be successful with the Whangawehi Catchment project, which will have many insights to share with a broader sub-regional programme.

The particular way in which local iwi and hapū will be involved will need to be determined through transparent consultative processes that are ideally co-designed by those groups and other key stakeholders.

3.1.1 Recommended Near-Term Action

MPI, HBRC, and the Wairoa District Council to continue to partner with iwi groups as an integral component of a sub-regional erosion control programme, with a view to exploring the leadership role that iwi can play in such a programme in partnership with local government and the Crown.

3.2 UPGRADE CATCHMENT GROUPS

National and local governing entities that are serious about solving the problem of erosion and water quality in the Wairoa District will need to find the necessary resources to deliver a serious (professional) solution. Waterways are a common resource impacted upon by land management on adjacent private property. Waterways management therefore, requires coordination of direct and indirect activities associated with waterways (e.g. riparian plantings, pest and weed control, promoting sustainable farming practices).

Recruiting consulting firms to undertake these activities would likely be prohibitively expensive. Such an approach would also increase the risk of insufficiently engaging local communities because of the likely cost of such consultation/engagement when undertaken solely by the private sector. Catchment groups, on the other hand, present a least-cost approach through low-cost human resources (i.e. significant voluntary effort) combined with potentially high levels of local community buy-in (when well managed) that can enable (and is necessary for) sustaining such programmes beyond seed-funding windows.

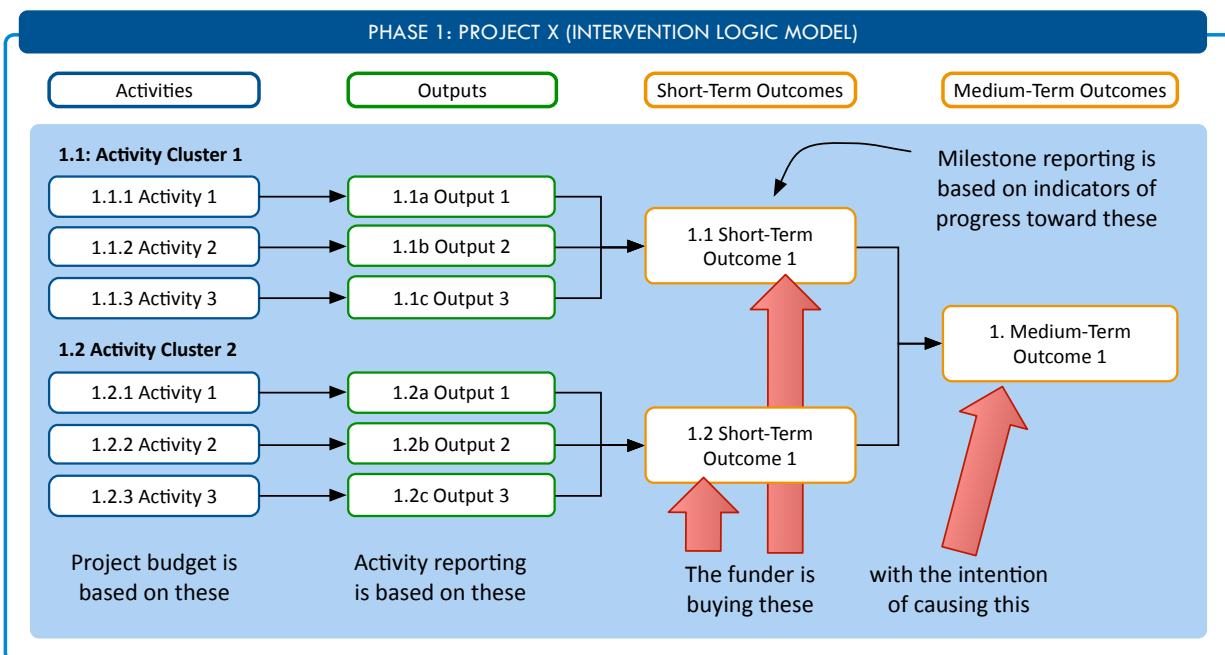
While catchment groups are often very good at mobilizing local voluntary labour, they are typically insufficiently resourced to deliver their full potential. They tend to cobble together funding from a variety of sources and operate on a shoestring. This can sometimes lead to poor governance and poor

financial discipline (i.e. not applying sound business practices), and reporting based on activity² rather than output and outcome delivery.

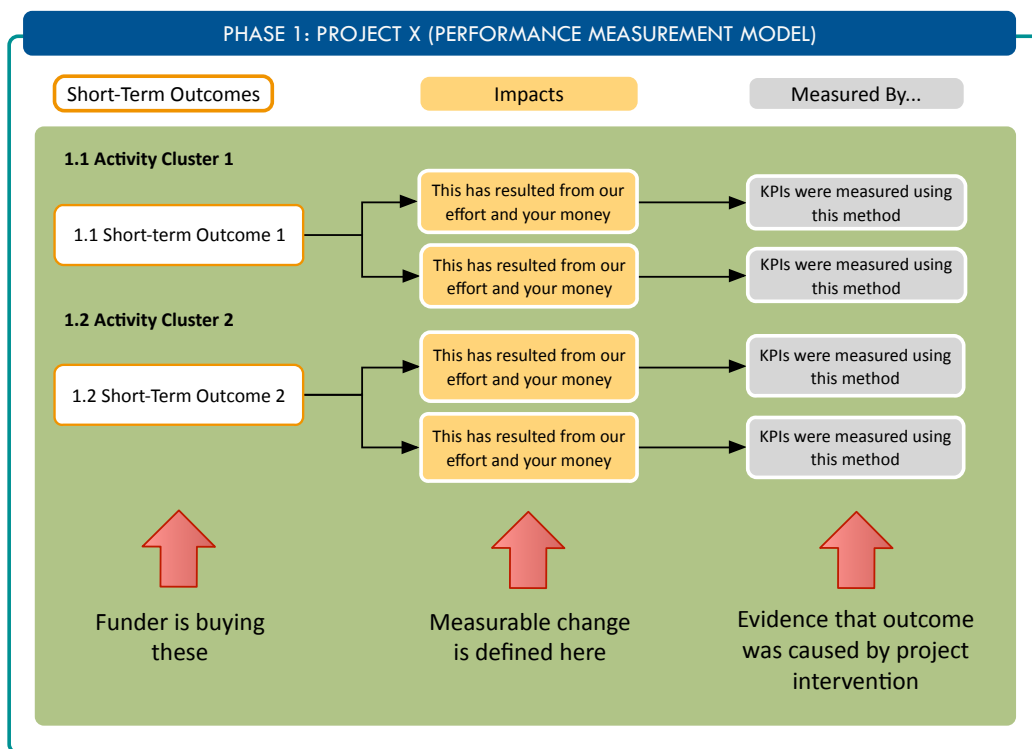
A middle path option presents itself for a (serious) Wairoa erosion control programme: professionalizing catchment groups by supplying additional resources to enable them to deliver a higher volume of measured outcomes in a disciplined manner and priced to cover the real costs of a least-cost approach. “Real cost” here refers to conservative budgets that adequately account for all necessary activities. This approach is somewhat counterintuitive for the community fundraising sector, which has a tendency to over-promise (“aim for the stars”) in funding applications, but under-deliver (“only land on the moon”) in outcome reporting (if outcomes are reported).

Professionalizing catchment groups through realistic funding can be accompanied by a transition to the kind of performance measurement promoted by the State Services Commission for government agencies. This could include the application of disciplined intervention logic models (example below) that clearly identify long-term, medium-term, and short-term outcomes (the latter purchased by funders).

Key performance indicators (KPIs) of progress towards (or delivery of) these outcomes can then be measured using best practice measurement methods in collaboration with central and local government entities (see example below). KPIs for short-term outcomes can then be used as the basis for the determination of outputs, activities and associated project budgets in funding proposals.



² For example, weed control performance measurement that is activity-based can enable a weed control operation to appear cost-effective whereby it targets high weed density areas, where the marginal cost of weeds-killed-per-unit-effort are low. But when the marginal cost increases (as the weed density decreases in response to weeding effort), there may be a tendency to relocate to other high weed density areas rather than eradicating weeds from the first area. This can lead to situations where activity performance is high but where strategic value is relatively low. Conversely, the *prima facie* cost-benefit of effective weed eradication can have the appearance (to non-experts on funding panels) of being comparatively inefficient because of this (commonly hidden) marginal cost element. But when measured against the avoided future cost of weed control, a strategically effective model can show a favourable cost-benefit.



Professionalizing catchment groups presents an opportunity for efficient central and local government spending on community-based partner organisations that are upgraded to operate as efficient, effective and transparent community enterprises. In turn, enabling catchment groups to become ready to operate as efficient community businesses will establish foundations for such entities to potentially become self-financing. This is because an efficient community business will have greater value as a professional but least-cost service provider in the sustainable land management sector.

3.2.1 Recommended Near-Term Action

HBRC, MPI and MFE collaborate on defining targeted outcomes to be allocated/devolved to the catchment group sector in the Wairoa District as a component of a wider erosion control programme. Consult with those with experience in this sector to scope budgets for a) paid coordinators, b) contractors, c) volunteers, d) community consultation, and e) operational expenses (e.g. nurseries). Price budget lines sufficiently to cover the real cost to deliver targeted outcomes. Concurrently explore a co-financing model that engages funding from HBRC, MPI, philanthropy, and landowners with MPI/HBRC funding disbursed via a contestable grant. Then recruit catchment group/s to implement funded project/s. MPI and/or HBRC to allocate funding for the development of catchment group management tools (e.g. business management; performance measurement & reporting) to enable recruited catchment group/s to perform at a professional level of short, medium and long term outcome delivery.

3.3 WAIROA WORK READINESS PROGRAMME

An integrated erosion control programme in the Wairoa District will need (and benefit from) a labour pool capable of supporting management activities on the land. Such activities (elaborated somewhat below) include hill country afforestation, nursery management, pest and weed control, manuka honey production, and contributions to a better-managed plantation forestry sector and other potential growth sectors (e.g. horticulture, aquaculture).

One of the challenges faced by entities seeking a local labour force (e.g. as already experience by the plantation forestry sector) is the lack of a sufficiently work-ready labour pool from within the Wairoa District. This has led the plantation forestry sector to recruit employees from outside this sub-region. This is indicative of a broader problem that an integrated erosion control programme could help address: enhancing local employment and associated multipliers.

3.3.1 Plantation Forestry Case-Study

There is a certain resistance to the current model of plantation forestry among a significant proportion of the local population in the Wairoa District, and it appears to relate to the following issues:

- Forestry is perceived as an absentee land management practice that removes land from farming employment opportunities.
- Plantation forestry is seen locally as the main cause of waterways disruption through downstream movement of forestry slash (logs and woody debris) onto lowland areas including, farms, bridges and beaches.
- Forestry currently recruits most of its labour force from outside Northern Hawke’s Bay.
- Forestry is not particularly visible in the local community in terms of community engagement.

Concurrently the plantation forest industry has an aging staff population with the average age in the harvesting segment of the industry of around 35-37 years and older for roading. The forest industry needs future recruitment, not just as a function of demographics, but also because a large area of plantation forest is coming on-stream for harvesting in coming years.

The experience of the plantation forest industry in seeking to employ local people from the Wairoa District is the lack of a labour force that is “work-ready” combined with a “work culture” that poses barriers to employment uptake. An example of a “work culture” barrier on the demand is the very early start time for forestry workers (e.g. 6am). If the plantation forest industry wants to attract younger workers, it may need to consider later daily start and finishing times – especially for new recruits that have yet to experience the lifestyle benefits of employment.

An example of a “work-readiness” barrier on the supply side is a potential labour force in the Wairoa District that currently lacks a suitable work ethic and work-related habits. Work-readiness amongst this demographic could be enhanced from the implementation of a work-readiness programme targeting senior school students and school leavers. The purpose could be to build a work ethic, positive workplace habits, vocational training, and entrepreneurship skills to enable participation in the plantation forest, manuka honey, horticulture, and pest and weed control sectors.

Such a work-readiness programme could potentially be co-financed by a public liability financing programme as mentioned below (3.4.3), combined with co-financing from the relevant employer sectors, and government agencies such as the Ministry for the Environment, Ministry for Social Development, Ministry of Education, Ministry for Primary Industries, Hawke’s Bay Regional Council, and the Wairoa District Council.

3.3.2 Recommended Near-Term Action

MPI and HBRC to consult with the plantation forest, manuka honey, horticulture, and environmental management sectors, the Ministry for Social Development, Ministry of Education, and the Wairoa District Council to develop a Wairoa Social Forestry Programme that targets community engagement

through a) a “work readiness” programme for recruitment into these sectors, b) other industry-funded community engagement actions arising from consultation with Wairoa District Council.

3.4 PLANTATION FORESTRY CONTROLS

3.4.1 Physical Geographic Context

During certain high rainfall events (and earthquakes) some larger landslide types will happen regardless of the vegetation on that land, and regardless of human activity. Here localised soil liquifaction occurs down to bedrock and the slope fails, taking everything above with it. Such events will happen in a plantation forest, natural forest or on pasture – they have been happening for many thousands of years as evidenced by sediment profiles in the bed of Lake Tutira. In the same rainfall events, smaller scale erosion can be lower under forest cover than under pasture where (in the latter) surface and rill erosion rates can be higher.

In the absence of extreme rainfall events, plantation forestry and pastoral agriculture both contribute to soil erosion but at different rates at different times. Suspended sediment in streams flowing through pastoral farmland can be 4 times higher than in streams flowing through a well-managed plantation forest. This higher pastoral sedimentation rate continues annually for decades.

Suspended sediment concentrations in streams flowing through plantation forest will spike during activities associated with harvesting (road building and harvesting) to around 3 times the rate of sedimentation under pastoral farming. But this increase in the sedimentation rate in plantations lasts for the 2-3 years of the harvest window, after which time sedimentation rates return to pre-harvest levels and correspondingly higher water quality.

When high rainfall events coincide with timber harvesting, there is an increased risk of downstream movement of forestry slash (logs and woody debris). Such rainfall events will also move logs and woody debris from pastoral land stream margins.

Reducing stream sediment overall, will benefit from:

- a. Afforestation of erosion-prone pastoral hill slopes.
- b. Plantation forestry management practices that reduce erosion risk associated with:
 - i. Forestry road engineering including river crossings.
 - ii. Retaining riparian margins of protected forest vegetation.
 - iii. The use of best practice timber-harvesting technologies that reduce soil disturbance.
 - iv. Rapid replanting following harvesting.
 - v. Catchment-based harvest planning to enable a significant proportion of a plantation catchment to remain under vegetation at any one time.

These actions will also reduce but not eliminate the risk of downstream movement of forestry slash, which pose a significant public liability to downstream property, infrastructure, and amenities. In fact, the movement of forestry slash was a key factor triggering this Options Paper.

The National Environmental Standard for Plantation Forestry (NES-PF) was not publicly available at the time of writing and will likely address several (if not all) of these issues in one way or another. This makes it difficult to make recommendations that will not be superseded by the NES-PF. In particular, it is not yet clear how forestry operators will efficiently demonstrate compliance to the NES-PF or where locally specific conditions can be imposed by the HBRC.

3.4.2 Fire Control

A warming climate is projected to bring more intense drought conditions to eastern New Zealand increasing fire risk in the plantation forest sector in coming rotations. It would be useful to review fire control plans in the plantation forest industry and compare with the NES-PF and existing regulations. If fire control infrastructure is inadequate there may be merit in exploring the potential for adding/requiring water reservoirs in plantation forestry catchments as a consent condition or as a condition for forestry to operate as a permitted activity. If reservoirs are added to the forestry landscape there may be opportunities to develop koura aquaculture in these reservoirs.

3.4.3 Public Liability

Downstream movement of forestry slash in high rainfall events, represents a public liability risk to downstream property, infrastructure and amenities. This can be seen as a form of debris trespass to downstream property owners. A sustainable land management programme needs to include a mechanism to finance the rapid removal of forestry slash from downstream areas in a way that does not pose additional costs to ratepayers. Options for a financing mechanism for rapid removal of forestry slash from downstream property include:

- a. Forestry company self-insurance through demonstrated cash reserves,
- b. Requirement for forestry companies to hold public liability insurance with a commercial insurance provider – potentially as a syndicate, or
- c. Requirement for forestry companies to participate in a public liability financing programme operated by Hawke’s Bay Regional Council.

Some larger forestry companies will be more likely to afford to carry self-insurance cash reserves, but some may not have factored this kind of cost into investment portfolio budgets. Smaller plantation operators may be unable to afford sufficient cash reserves to cover the costs of any single event (e.g. ~\$100,000), but could be required to contribute to either a public liability insurance policy with a commercial insurance provider, or a public liability financing programme operated by the Hawke’s Bay Regional Council or a subcontracted entity.

If considering a requirement for forestry companies to take out public liability insurance with a commercial insurance provider (including as a syndicate), it would be sensible to scope a proposal with an insurance broker with international experience and capable of providing an international insurer given the specialised insurance product required. Examples of New Zealand brokers with this kind of experience include AON, Crombie Lockwood, Marsh, Willis, or Rothburys. The upside of commercial insurance providers is that they will administer the insurance programme. The downside is that they will likely charge up to 30% commission and premium deposits will not be available for reinvestment in a sustainable land management programme.

This is where a public liability financing programme could be established locally and operated perhaps by HBRC or a subcontracted entity. This could take the form of a Crown grant and an annual premium from all forestry companies at a rate in proportion to their size, and the financial scale of the risk burden. Then the rapid removal of forestry slash (e.g. immediately following a flood) becomes the responsibility of the HBRC in partnership with a suitable contractor. An advantage with this approach worth considering is the lack of up to 30% commission charged by an insurance brokerage, and an opportunity to use interest on premiums to co-finance an aspect of social forestry (e.g. a forestry work-readiness programme in schools and for school leavers in Wairoa). For example, a deposit of \$1 million invested at 3.36% will generate \$37,000 in interest annually that could be used to co-finance a work-readiness programme (see below).

3.4.4 Recommended Near-Term Action

HBRC develop/refine regulations requiring forestry operators in Northern Hawke’s Bay to be required to demonstrate:

- Forestry road and river crossing engineering practices that minimize soil erosion risk.
- Harvesting and re-planting design schedules (combined with road plans) to enable a significant proportion of large plantation forestry catchments to be under forest cover at any one time. The details should be developed in close consultation with best practice players in the forestry industry.
- Participation in public liability insurance (or equivalent) programme for rapid removal of forestry slash following high rainfall events.

HBRC to consult with the plantation forest industry in Hawke’s Bay to determine the most publically beneficial model for a public liability financing programme for rapid removal of forestry slash following high rainfall events. Options include a requirement for plantation forestry companies to a) self-insure for this form of public liability risk, b) take on public liability insurance either individually or as a sub-regional (i.e. Northern Hawke’s Bay) syndicate through a suitable insurance broker, or c) contribute to a public liability financing programme operated by the Hawke’s Bay Regional Council or subcontracted entity that generates financing co-benefits for social forestry in the Wairoa District.

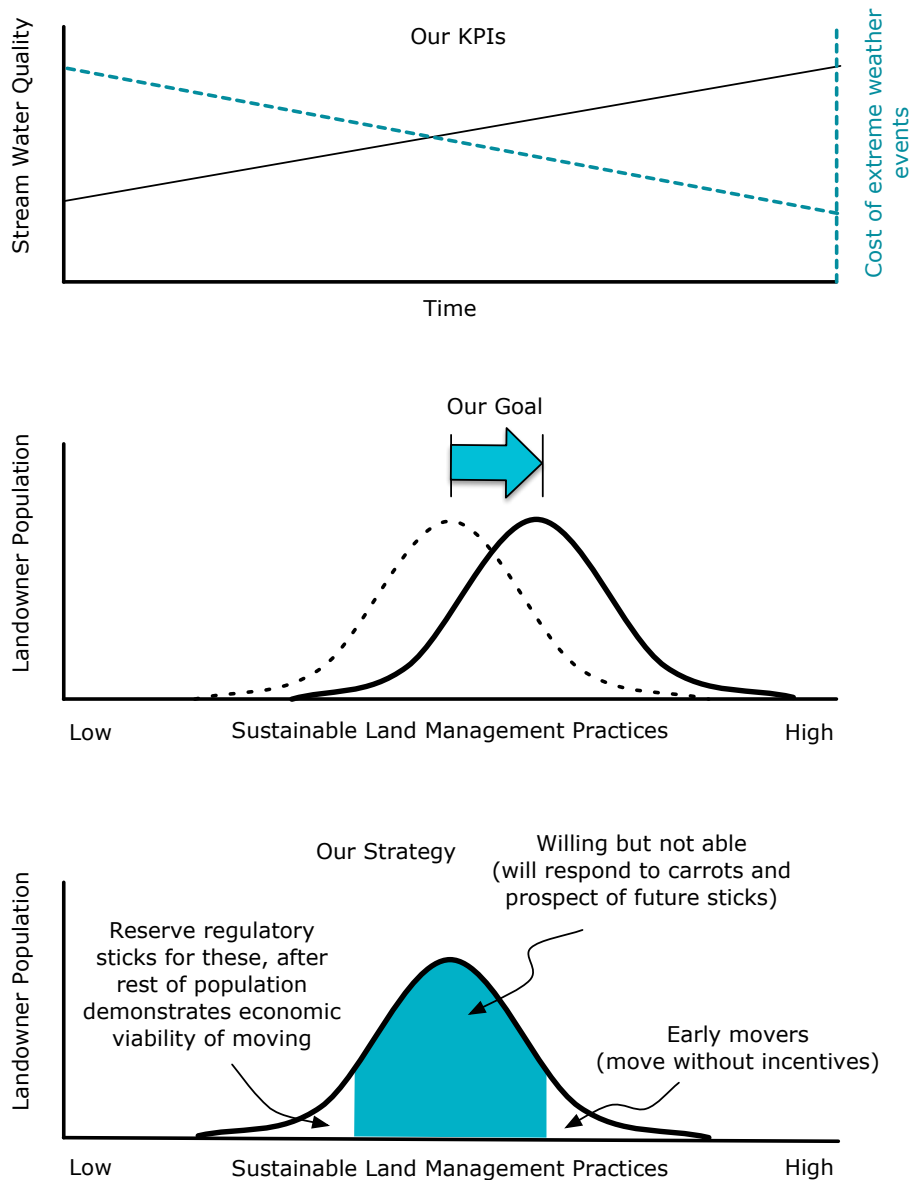
3.5 HBRC POLICY REVIEW

Resource management behaviour change can be efficiently and effectively brought about through the administration of a combination of “carrots and sticks” working in unison. The threat of future regulation can work to stimulate voluntary uptake of incentive mechanisms on offer, and when co-designed with incentive mechanisms, can help to make incentive mechanisms more efficient and effective. This can have the net effect of minimizing the number of landowners/land managers faced with command-and-control measures. In turn, this reduces the electoral risk of strategic sustainable land management programmes locally and nationally. The concept diagrams below (Figure 3.5) depict an overview of strategic outcomes sought from a sustainable land management programme.

Regulatory instruments available to central and local government would ideally be integrated into a sustainable land management programme to maximise the synergy with incentive mechanisms. The details of such regulatory instruments would ideally be determined during the design phase of a pilot initiative (see below).

Such regulatory measures could be based upon a requirement for Farm Environmental Management Plans for all properties in the Wairoa District to be completed by a certain deadline, and then use Farm Environmental Management plans as the basis for required retirement from grazing of lands classified as ‘High Landslide risk – delivery to streams’ by a certain date. During the intervening period (e.g. an 8 year window) land managers will have an opportunity to voluntarily respond to incentive mechanisms to change land use to more sustainable forms.

Figure 3.5. Concept Diagrams depicting the goal and strategy for sustainable land management and water quality improvement for Northern Hawke’s Bay.



3.5.1 Recommended Near-Term Action

HBRC to undertake a policy review of potential regulatory measures available for local implementation of the National Policy Statement on Freshwater Management 2014 combined with a voluntary incentive programme for strategic erosion control for Northern Hawke’s Bay. The purpose of such forthcoming regulation³ is to a) send a behaviour change signal to private land managers to respond to opportunities to change behaviour through access to incentive mechanisms during a regulatory holiday window, and b)

³ E.g. coming into force 8 years after launching incentive mechanisms.

to implement command-and-control measures after a regulatory holiday window to cause required behaviour change that has not yet happened (e.g. compulsory retirement from grazing of lands classified as ‘High Landslide risk – delivery to streams’).

3.6 EROSION CONTROL AFFORESTATION SCHEME

A direct financial incentive mechanism could be developed for afforestation of land in the Wairoa District classified as “High Landslide Risk – delivery to stream”. This could be developed, tested in a pilot project (see Section 3.9 below) as a second-generation financing instrument for erosion control called the Erosion Control Afforestation Scheme (ECAS). The ECAS could then be refined and rolled out as a nationwide erosion control funding mechanism targeting high erosion-risk lands. The ECAS could have the following attributes:

- A single purpose of incentivising new permanent forest establishment on erosion-prone land (Class VIe, VIIe, VIIIe) and classified by the Hawke’s Bay Regional Council as “High Landslide Risk – delivery to stream”, with a national carbon co-benefit.
- Ring-fence a portion of the Afforestation Grant Scheme and combine with a ring-fenced portion of the East Coast Forestry Project (ECPF) funding and allocate to a special ECAS fund specific to a nationally significant pilot project in the Whakaki catchment (see Section 3.9 below). Change disbursement rules of the AGS to overcome the existing barriers to uptake relating to cash flow risk of landowners in the Wairoa District. Currently the AGS supplies funds ex post in order to reduce non-delivery risk to the Crown. But this reduces funding accessibility to landowners in the Wairoa District that tend to face cash flow challenges. The ECAS should have a performance-based funding model designed to keep non-delivery risk low, but should also have disbursement rules that lower the bar to access. This could be delivered in the form of an ex ante (up front) interest free loan that matures into a grant when the applicant provides evidence of performance. More details on this are presented below under ‘ECAS Design Features’.
- The NZUs sourced from land registered in the ECAS (but only after a 5 year afforestation establishment window) would have a specific erosion mitigation and water quality co-benefit value and could be marketed accordingly in the ETS (carbon + erosion control value).
- HBRC and MPI could assign a suitable entity to play a “match-making” role with forestry land offsetting, matching a party (potentially from another region) seeking land for afforestation (demand) with the supply of erosion-prone lands in the Wairoa District. Both demand and supply sides of this “market” could apply to the Crown (or designated entity) for access to each other through a special provision in the Erosion Control Afforestation Scheme.
- Land registered in the ECAS becomes ineligible for any future timber harvesting due to its erosion-prone status targeting land classified by the Hawke’s Bay Regional Council as “High Landslide Risk – delivery to stream”.
- Land registered in the ECAS becomes eligible for additional funding for fencing if retired pasture for inclusion in the ECAS does not coincide with existing fencing boundaries.

3.6.1 ECAS Design Feature Recommendations

The ECAS should apply to land currently classified as 'non-forest land' but which has had plantation or indigenous forest prior to 1990 (lands classified under Article 3.4 of the Kyoto Protocol or equivalent). This would avoid perversely excluding high priority erosion-prone land that happened to have been classified as "forest land" as of 31 December 1989. This particular land could remain ineligible for crediting under the ETS (unless and until the Crown brings Kyoto Protocol Article 3.4 forestry (forest carbon stock change on pre-1990 forest land) into the ETS carbon accounting boundary).

Include land without a "sufficient natural seed source" provided the land is to be planted in indigenous trees (e.g. manuka). Include rules requiring manuka plantations to meet per hectare planting rates compatible with erosion control ecosystem service priorities. This is to avoid manuka plantations taking advantage of erosion control afforestation funding without providing the level of erosion control required to reduce stream sediment loads in the target area.

Include a requirement for applicant to furnish a covenant (e.g. a 'Memorandum of Encumbrance') on the land title preventing grazing for a 50-year period and requiring that the target land is fenced from grazing stock. A Memorandum of Encumbrance is a form of mortgage recognised under the Property Law Act 2007 and the Land Transfer Act 1952 and can function as an "administratively light" version of a covenant. A covenant of this form will reduce non-delivery risk to the Crown on ECAS funding. The "Beneficiary" of the Memorandum of Encumbrance could be the Minister for Primary Industries or the Minister for the Environment (or both). One of the conditions in the Memorandum of Encumbrance is that the landowner relinquishes any carbon rights during years 1-5 of participation in the ECAS funding cycle (reason given below).

An ECAS Reversion Grant of \$2,000/ha could be awarded if the land is afforested by allowing retired pasture to revert naturally to native woody vegetation. An ECAS Planting Grant of \$2,500/ha could be awarded if afforested with indigenous plantings. An ECAS Fencing Grant could be awarded if retired pasture does not coincide with existing fence lines, or is contained in the same paddock as a significant area of non-erosion-prone pasture necessary for pastoral farming or horticulture.

The ECAS Reversion Grant could be disbursed in two instalments with the following details:

Instalment 1: 70% of the total grant (i.e. \$1,400/ha) disbursed as an interest-free loan upon registration of the land with the ECAS and execution of the Memorandum of Encumbrance. The purpose of Instalment 1 is to co-finance pest and weed control on the retired pasture for two years following pasture retirement.

Instalment 2: 30% of the total grant (i.e. \$600/ha) disbursed as an interest free loan two years after execution of the Memorandum of Encumbrance, and after the applicant has submitted the first Pest and Weed Control Report. The first Pest and Weed Control Report needs to provide evidence that pest and weed control activities have been undertaken, and evidence of the outcome of those activities for a full two year period following execution of the Memorandum of Encumbrance. This two-year period is the first Pest and Weed Control Period.

Loan Becomes Grant: The applicant submits the second Pest and Weed Control Report providing evidence of pest and weed control activity and evidence of the outcome of those activities for a full two-year period following the first Pest and Weed Control period. This two-year period is the second Pest and Weed Control Period.

Approval of the second Pest and Weed Control Report triggers the transformation of the interest free loan of \$2,000/ha into a grant.

The end of the second Pest and Weed Control Period marks the beginning of eligibility for the Afforestation Area to be registered under the ETS. Applicants can then issue NZUs, the first vintage of which corresponds to the first year following the end of the second Pest and Weed Control Period.

The ECAS Planting Grant of \$2,500/ha could be disbursed in three instalments. Instalments 1 & 2 comprise a Forest Establishment Loan (80% of the total grant); Instalment 3 targets Pest and Weed Control (20% of the total grant). Disbursements could be made with the following possible details:

Instalment 1: Performance-based interest-free loan of 70% of the Forest Establishment Loan (i.e. 70% of \$2,000/ha = \$1,400/ha) after registration with the ECAS and execution of the Memorandum of Encumbrance. This loan becomes a grant when the recipient completes all three stages of the grant cycle, but remains a loan if the three stages are not completed. The first instalment is an ex ante (up front) payment to provide cash flow to enable landowners to get the planting done at minimal additional cash flow risk.

Instalment 2: The landowner completes the planting activity and prepares a Forest Establishment Report containing a) the start and end date of planting activity (Forest Establishment Period), and evidence that the plantings have been completed as specified in the original grant application. Failure to submit a Forest Establishment Report within two years of receiving the Forest Establishment Loan triggers the Crown to execute loan recovery proceedings and issue penalties if penalties are included in funding conditions. The Forest Establishment Report contains evidence of the number of hectares actually planted. On acceptance of the Forest Establishment Report the status of the first instalment shifts from a loan to a grant, and the applicant receives Instalment 2 – i.e. 30% of the \$2,000/ha (i.e. \$600/ha) as an interest-free loan.

Instalment 3: Once the applicant has become fully registered in the ECAS (i.e. fulfilled the requirements of Instalments 1 & 2), they become eligible for Instalment 3 in the form of an interest-free loan of \$500/ha for Pest and Weed control. A “Pest and Weed Control Support Period” of four years is defined after the Forest Establishment Period. After the Pest and Weed Control Support Period has ended, the applicant submits a Pest and Weed Control Report, providing evidence of pest and weed control activity and the outcomes of that activity in the Afforestation Area. Upon approval of the Pest and Weed Control Report the status of the entire interest free loan of \$2,500/ha changes to a grant and the applicant receives a Verification Report stating that all obligations under the ECAS grant have been fulfilled.

The end of the Pest and Weed Control Support Period marks the beginning of eligibility for the Afforestation Area to be registered under the ETS. Once registered under the ETS ECAS registrants could become eligible to be issued NZUs, the first vintage of which corresponds to the first year following the end of the Pest and Weed Control Support Period.

Non-performance risk could be addressed by litigation against the Memorandum of Encumbrance and appropriate penalties for non-delivery.

The ECAS Fencing Grant could be awarded on a case-by-case basis at a rate yet to be determined.

3.6.2 Recommended Near-Term Action

Establish a pilot Erosion Control Afforestation Scheme (ECAS) initially limited to the Whakaki Catchment, to test and refine an incentive mechanism for the retirement and afforestation of lands classified as “High Landslide Risk – delivery to stream”. Finance the ECAS by establishing a ring-fenced portion of the Afforestation Grant Scheme, combined with a ring-fenced portion of the East Coast Forestry Project (ECPF) funding and allocate to a special ECAS Fund. The ECAS Fund to be justified (i.e. defended against criticism from other regions) on the basis of a) the special (long running) erosion and water quality degradation circumstances in the Wairoa District in general and the Whakaki catchment in particular, and b) the need for a pilot project to test this particular funding mechanism without having to change the entire AGS and the ECPF, and c) where the outcome of this pilot project could lead to redesigning the AGS and ECPF in a way that could benefit other regions. The ECAS to adopt disbursement rules specified in Section 3.6 of this Options Paper. If proven effective, the ECAS could be scaled up to target high erosion risk lands across a wider area in Hawke’s Bay and potentially nation-wide.

3.7 COMPLEMENTARY MEASURES

In practical terms, direct land use change on high-risk land classes will be more enabled when undertaken in conjunction with complementary measures to help address opportunity costs and (real or perceived) risks to farm cash flows. Such complementary measures can include innovative activities on lower-erosion-risk land classes that add value and cash flow to the farm business, and enhance opportunities for local economic growth. Complementary activities potentially include:

- Conversion of lowland pastoral farmland (flats) to intensive horticultural land uses such as olive oil, avocado oil, and citrus (e.g. lime) production.
- Sheep dairying (for infant formula) on low risk hill country pasture.
- Manuka honey processing infrastructure support.
- Emissions Trading Scheme design that supports afforestation of erosion-prone pasture.
- Integration of plantation forestry catchment fire control water reservoirs with koura (freshwater crayfish) aquaculture for export (relevant to plantation forest industry rather than farmers).
- Eel production coastal wetland areas like Whakaki lagoon.

Such activities can be justified under a framework of stimulating rural economic growth in a sub-region that suffers from low economic performance and related social indicators. There is also potential to link economic growth stimulus with erosion control if offered as a combined package, where eligibility to access support for new industries and enhancement of existing farming practices (including beef and lamb production) is linked to erosion control performance under a Rural Productivity Innovation Programme.

For example, each of the potential rural growth sectors mentioned above, and the existing beef and lamb sector would benefit from some level of Crown support to stimulate uptake on the supply side, facilitate access to markets on the demand side, and provide support for strategic infrastructure to enable each to realise their full potential. In the olive oil, avocado oil, and lime sectors there is plenty of demand but current problems with supply. Favourable supply contracts will boost the level of operation and potentially add considerable value to flat land in the region. With sheep dairy there is a big opportunity to access value added export niche markets that have significant growth potential, but it requires processing plant investment that would benefit from keystone investment from the Crown. With beef and lamb there are opportunities to migrate most if not all farms in the Wairoa District to

industry best practice for sustainability and maximising returns per unit effort with the aid of appropriate enhanced advice and support.

Iwi have shown strong support for koura farming in forestry fire control dams in the South Island, and the same could be true for Northern Hawke’s Bay. Providing support for Hawke’s Bay Iwi to learn from Iwi experiences in the South Island and potentially form a larger supply partnership may help to provide a better security of supply arrangement to satisfy export buyers in China.

3.7.1 Manuka Honey

The Erosion Control Afforestation Scheme as described above could function as the co-financing seed capital covering the establishment costs of carbon and manuka honey production on erosion controlled land that is retired from beef and lamb production. The establishment period of afforestation in manuka for example, would have access to a total of \$2,500/ha during manuka establishment, and then access to annual carbon and manuka production that in aggregate can potentially compete with a baseline of beef/lamb production on the same lands.

Table 3.7.1 provides an indication of the comparative annual per hectare revenue potential under an ECAS approach.

Table 3.7.1. Approximate comparative economic productivity of manuka honey + carbon in comparison with beef and lamb on steep lands.

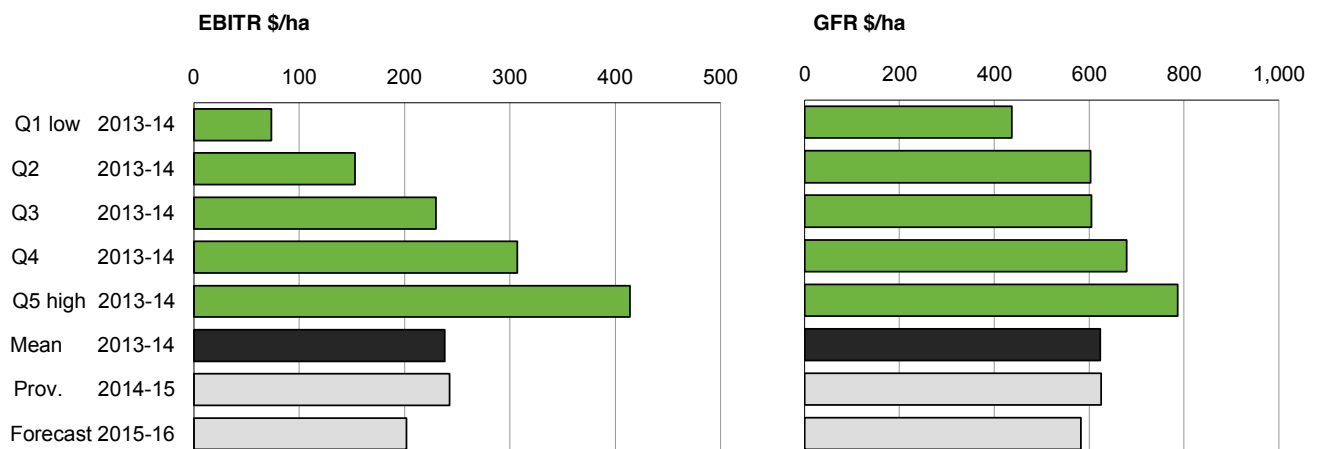
Activity	Detail	~ \$/ha/yr	yr
Forest Establishment	Years 1-5 @ \$2,500/ha	\$500	1-5
Carbon*	North and South-facing slopes	\$100	6+
Carbon + Manuka **	North-facing slopes	\$400	6+
Beef/Lamb***	North & South facing slopes	\$250-\$350	Baseline

* Based on assumption of 6tCO₂e/ha/yr excluding administrative costs.

** Estimate based on a combination of yield, UMF, % of revenue to farmer, and carbon.

*** Estimate based on EBITR using data from the Beef & Lamb.

Figure 3.7.1 Beef and lamb productivity per ha for ‘Hard Hill Country East Coast’ – Source: Beef + Lamb NZ. EBITR = Earnings before interest, tax and rents; GFR = Gross Farm Revenue.



The manuka honey industry also has significant potential for growth. The ECAS proposed above would stimulate supply, but for this industry to grow to its potential and sustain cash flow benefits to landowners, there is a need for investment in infrastructure to strategically unlock opportunities on the demand side. One example is the need for a high quality toll processing plant to open the industry, where many different suppliers can either sell to the processor or on-sell processed product to a range of potential demand channels. Crown investment on the supply side through an ECAS without complementary investment on the processing and demand side would risk an over-supply situation and all of the associated problems. The Crown could act as a keystone investor to stimulate private sector investment in a high quality toll processing plant in the Hawke's Bay region (e.g. Hastings).

3.7.2 Carbon Market

The Crown is currently reviewing the New Zealand Emissions Trading Scheme, and now has the opportunity to redesign it to create conditions that are favourable to private sector investment in erosion control. Such investment can take the form of buyers in the carbon market seeking to align themselves with erosion control, and private investors seeking to support the scale-up of erosion control activities when combined with complementary production such as manuka honey. The ideal outcome from an erosion control perspective is an Emissions Trading Scheme that generates sufficient demand and price stability at a level sufficient to stimulate wide-scale afforestation of erosion-prone lands. This would also serve to assist the Crown in accessing a sufficient domestic supply volume of carbon units required for intergovernmental emissions trading obligations in the current and forthcoming commitment period/s. The benefits of afforestation to the New Zealand net position in its intergovernmental commitments would complement the sustainable land management benefits of a well-functioning ETS. In this way, the NZETS could deliver substantial water quality co-benefits and provide an enabling infrastructure for local government to more efficiently deliver outcomes consistent with the National Policy Statement for Freshwater Management.

3.7.3 Recommended Near-Term Action

Rural Productivity Innovation Programme

Establish a consultation process with beef & lamb farmers in the Wairoa District, Business Hawke's Bay, iwi, manuka honey operators, horticultural operators, sheep dairy operators, MPI, and HBRC to scope out realistic support that the Crown and HBRC could provide in a Rural Productivity Innovation Programme. Such a programme could function through a) Crown keystone investment in enabling infrastructure to stimulate private sector investment, and b) advisory support (from HBRC, MPI, Business Hawke's Bay and other suitable agencies) for farmers seeking to transition to more sustainable farm productivity innovations. Scoping the form of advisory support could be undertaken by means of a Wairoa District Sustainable Farming Innovation Workshop to bring together stakeholders in pastoral farming, manuka honey, horticulture, sheep dairy operators, sustainable farming, and iwi.

Access to advisory support could be reserved for farmers who have already participated in the ECAS beyond a certain trigger point (e.g. executed a Memorandum of Encumbrance on retired pasture). Such farmers could then become eligible for government support in the Rural Productivity Innovation Programme on a performance-basis and as a complementary measure to the erosion control efforts they have already undertaken and as a reward for moving in a desirable strategic direction. The Rural Productivity Innovation Programme could provide advice to farmers seeking to transition to more sustainable farming practices including other production types (e.g. moving from beef to sheep dairying) and/or more sustainable approaches to existing production. The point is to reward good behaviour in a

way that reduces transition risk for the participating farmer and creates sustainable land management farm business success stories. An additional condition for gaining access to government support could include the farmer agreeing to eventually participate in mentoring other farmers that are new entrants to these support programmes.

Carbon Market

HBRC, and the Wairoa District Council make a joint recommendation to the Minister for Climate Change on how the next version of the New Zealand Emissions Trading Scheme could function as an effective supporting infrastructure for erosion control. These entities could recommend that mechanisms be investigated to ensure that the carbon price for targeted erosion control afforestation is sufficient to stimulate such afforestation (e.g. \$20-\$25/tCO₂e in the near term). This could include an underwriting mechanism for afforestation activities under the ECAS.

3.8 SUSTAINABLE FARMING

Farmland erosion control, riparian plantings, more sustainable pasture management practices, and stock exclusion from streams will make a contribution to water quality by reducing stream sediment loads. But these actions are not sufficient to reduce stream nutrient levels necessary for water quality improvement. Soluble fertilizer applications onto pasture can be a significant source of increased stream nutrient levels that can degrade water quality. For this reason, reducing the volume of soluble fertilizer discharge into streams is an important part of the equation for reversing chemical degradation of waterways.

Sustainable farming practices have received much attention in recent decades with research and development of farming practices that reduce detrimental impact on the environment (including stream water quality). It would be useful to capitalize on such research and development by means of a Wairoa Sustainable Farming Programme. This could include a desktop review the available science and economics of the range of sustainable farming practices in New Zealand to identify different options for supporting an upgrade of existing farming types (e.g. beef and lamb production) to lower their environmental impact. The results of such a review could then be presented at a Wairoa Sustainable Farming Innovation Workshop that brings together local farmers and iwi groups, farmers and industry leadership groups from around the country with experience in sustainable farming, sustainable farming scientists and economists, and organisations supporting sustainable farming, MPI, HBRC, and MFE. The purpose of the workshop could be to identify ways to support local farmers in a transition to more sustainable farming practices, to identify real and perceived risks of such transitions and ways to mitigate these risks.

3.8.1 Recommended Near-Term Actions

HBRC to fund a Wairoa District Sustainable Farming Programme that includes a desktop review of sustainable farming science and economics, and a multi-stakeholder Wairoa Sustainable Farming Innovation Workshop to identify ways to support local farmers in a transition to more sustainable farming practices.

3.9 WHAKAKI ECOLOGICAL INFRASTRUCTURE PROJECT

This Options Paper recommends an integrated approach to erosion control and water quality in the Wairoa District. Preserving the integrity (and internal synergies) of an integrated approach can be enabled whilst reducing financial risk to funding agencies by reducing the scale of activity to a pilot project in a defined geographical location.

Consultations with local stakeholders including Hawke’s Bay Regional Council, Wairoa District Council, and local Māori have settled upon the Whakaki Catchment as a suitable pilot project area. The reason Whakaki presents an ideal opportunity for a geographically defined pilot project relates to it being a relatively small catchment with a relatively small number of landowners, supporting plantation forestry and pastoral farming, located in close proximity to State Highway 2, and with a large lagoon area in much need of water quality improvement. This catchment has also benefited from previous work under the SLMHCE Project – Wairoa Sediment Reduction Initiative and Catchment Facilitation Programme. This pilot project area is also located relatively close to the Whangawehi Catchment project on the Mahia Peninsula from which valuable lessons can be learned.

Figure 3.9a. Whakaki Catchment location.

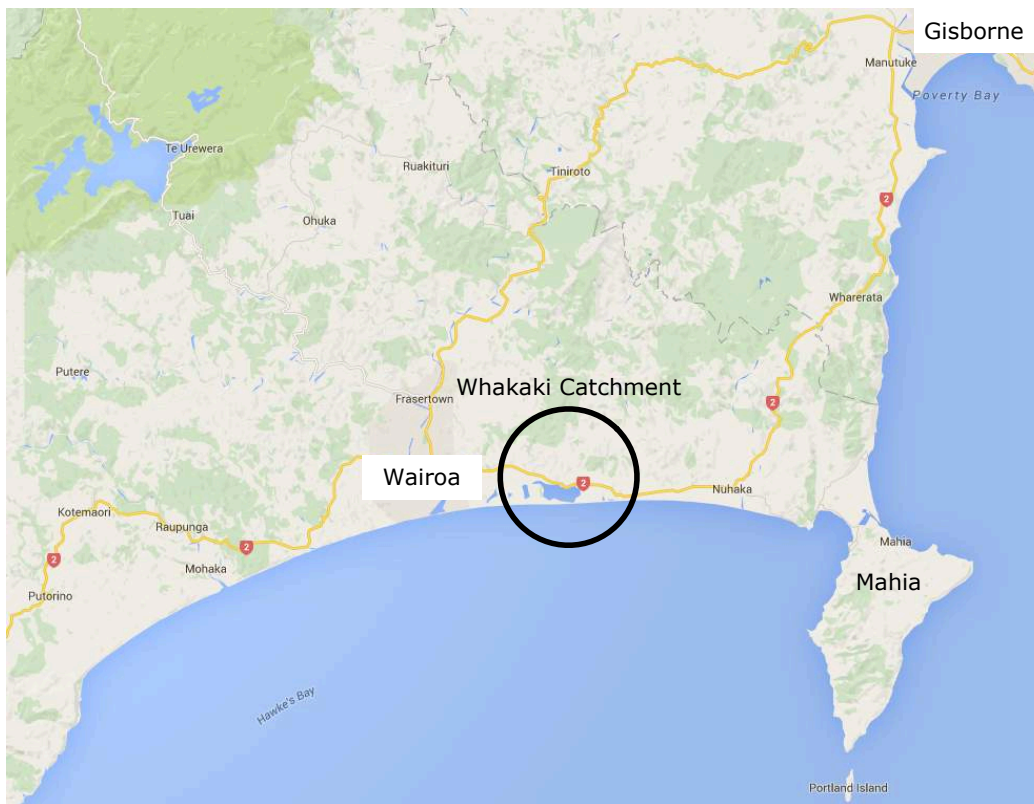
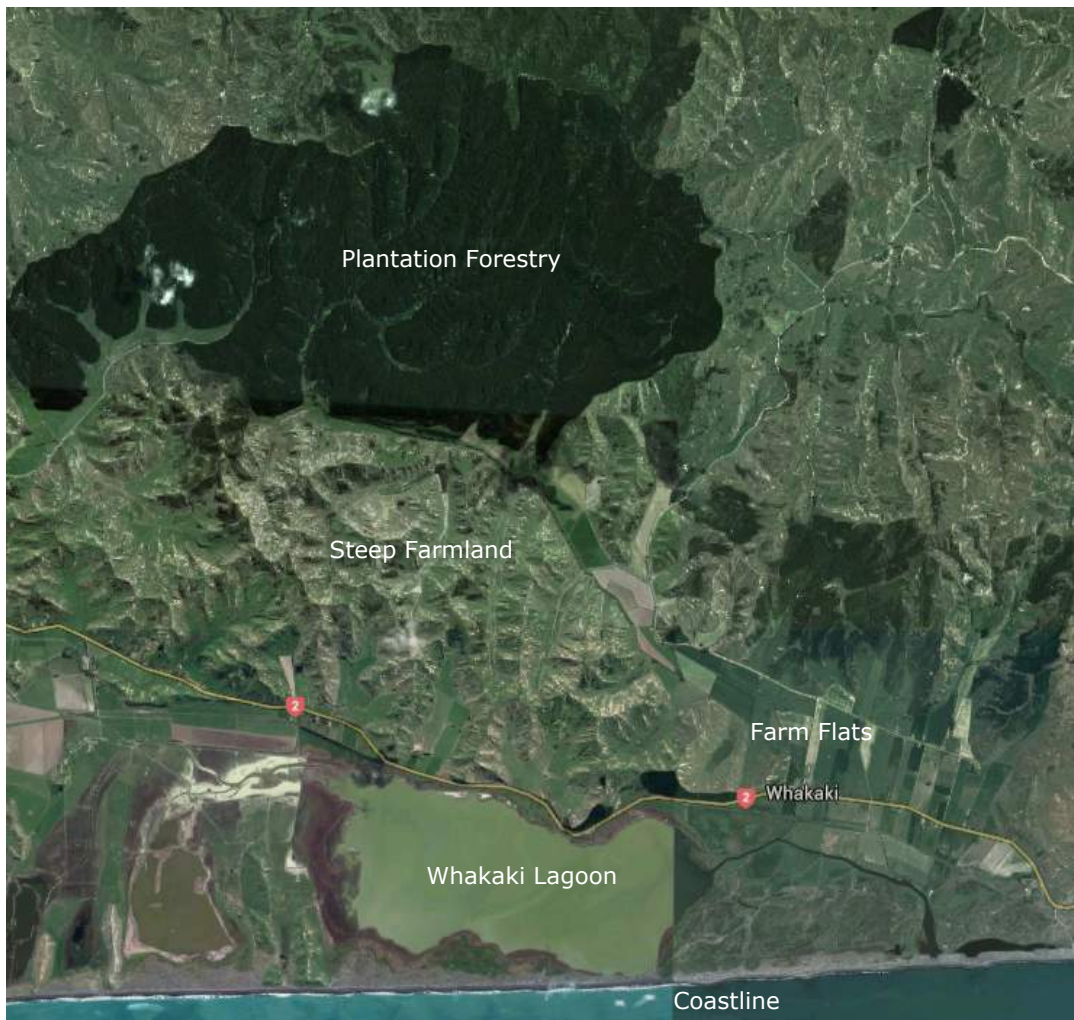


Figure 3.9b. Whakaki Catchment land use.



The “Whakaki Ecological Infrastructure Project” could apply all components of an integrated approach (outlined in this report) to this area in an intensive “test-drive” of these tools. The reason to focus on the language of ‘ecological infrastructure’ is to get this concept onto the regional policy and economic development radar, and use it as a lens for viewing sustainable land management as a strategic mechanism for rural economic growth and human wellbeing. This kind of framework makes it easier to highlight the linkages between a) beneficial ecosystem services (delivered by ecological infrastructure such as indigenous vegetation on erosion-prone land) and b) economic performance and human wellbeing. It also provides a logical framework for pricing the value of ecological infrastructure investment (e.g. publicly funded incentives for afforestation). This can be done by calculating the costs to the economy of not investing in such infrastructure (e.g. the cost/risk/exposure to extreme weather events), and comparing this with the net cost of mitigation actions.

Aside from the Christchurch earthquake, New Zealand’s most expensive civil calamities have tended to be and will likely continue to be flood events. Pricing the benefits of reducing the impact of future floods is one component of pricing the benefit of ecological infrastructure investment capable of reducing flood damage (e.g. reducing hill slope and streamside erosion and forestry slash risk). In turn, this helps to determine an efficient scale of ecological infrastructure investment, particularly when the form of such investment generates co-benefits such as positive near-term cash flows (e.g. carbon and manuka honey turnover), and a strategic realignment of the rural economy towards a more durable model given the physical environment it must operate within.

Note also that climate projections signal a likely increase in the intensity of droughts and storm events in coming decades. Building resilience to these risks can be seen as a prudent investment by conservative planners. Future-proofing landscape infrastructure for enduring economic prosperity in the face of global challenges, can also have greater electoral appeal both locally and nationally compared with a narrative of “looking after nature”. Under this approach, nature also gets “looked after,” but delivering human wellbeing is the politically and economically enabling framework. This approach is also in line with the Millennium Ecosystem Assessment, the Economics of Ecosystems and Biodiversity (TEEB), and the UN Sustainable Development Goals.

3.9.1 A Multi-Stakeholder Approach

The Whakaki Ecological Infrastructure Project could be used to design, test and refine the combined efficiency of the following:

- Direct financial incentives in the form of an Erosion Control Afforestation Scheme, that could thereafter be scaled up.
- The existing NZ ETS (with the hope that the Crown protects the carbon price to enable carbon to be a realistic cash-flow proposition for erosion control activities).
- Indirect complementary measures (e.g. to support sustainable beef and lamb farming, the manuka honey, sheep dairy, olive oil, avocado oil and lime horticulture sectors).
- Allocating key responsibilities to an upgraded catchment group model.
- Stronger plantation forest industry performance rules as a best practice demonstration of the National Environmental Standard for Plantation Forestry (including public liability measures).
- Measurement, reporting and verification of key performance indicators for catchment water quality to test the efficacy of interventions. This should involve quantitatively comparing baseline (before intervention) water quality KPIs (e.g. stream sediment and phosphorus yields) with project (after intervention) KPIs.
- Use this catchment as a training location for a “work-readiness” programme.
- Close collaboration overall and in certain areas co-management with iwi, non-Maori private landowners, the plantation forestry industry, local government, and community organisations.

The Wakaki Ecological Infrastructure Project could be designed and implemented by means of a staged, multi-stakeholder consultation process led by a facilitation team with HBRC functioning as the secretariat. This could be rolled out through stages similar to the following:

Event	Purpose	Strategy	Timing
Project Signing	Symbolic partnership announcement to raise awareness in the wider community and receive initial stakeholder feedback	High profile event with key partner stakeholders and the public.	Q4 2016
Multi-stakeholder Project Design Workshop	Determine project design features	Presentation of a Project Design Framework prepared prior. Breakout group consultation to refine key components. Result: multi-stakeholder mandate & raw material for final Project Design.	Q1 2017
Project Launch	Showcase final design and launch implementation actions	Presentation of Final Project Design and assign roles and responsibilities (all prepared prior).	Q2 2017
6-monthly Project Reporting Workshops	Project milestone reporting, highlighting lessons learned, results, and any modifications for following period	Keep the project stakeholders interacting regularly and sharing experience. Provide a context for monitoring results to be presented, and adaptive management to be applied.	Q4 2017 Q2 2018 Q4 2018 Q2 2019 Q4 2019

3.9.2 Measurement, Reporting and Verification (MRV)

The effectiveness of strategic interventions in sustainable land management can only be unequivocally established if such interventions directly and indirectly cause/enable outcomes that are real, measurable, and additional (i.e. would not have happened anyway). Measurement, reporting and verification (MRV) of key performance indicators are central to the demonstration of the value of such interventions and associated investments. This safeguards against inefficient investment in poorly targeted actions and can help discipline the design and implementation of interventions. MRV can also enable adaptive management by helping to identify interventions that make the largest measurable difference at least cost.

It is recommended that the Whakaki Ecological Infrastructure Project include the development and refinement of an MRV system that is compatible with and complementary to the National Policy Statement for Fresh Water Management, the National Environmental Standard for Plantation Forestry, and existing monitoring regimes undertaken by local government and other research agencies.

3.9.3 Evaluating Ecological Infrastructure Investment

An Ecological Infrastructure investment lens provides a conceptual framework for benefit-cost analysis that takes into account the strategic economic contribution of such investment against factors such as a) avoided future cost of extreme weather events, and b) engineering investments required to provide the equivalent event mitigation services. Such analysis can provide valuable information for policy, business, and private sector investment stakeholders within and beyond the borders of a pilot project.

It is recommended that the Whakaki Ecological Infrastructure Project include an investment analysis of pilot project interventions applying an 'Ecological Infrastructure Investment' and 'The Economics of Ecosystems and Biodiversity' (TEEB) lens. Such an analysis should be structured to maximize relevance for local, regional, and national policy on sustainable land management.

3.9.4 Recommended Near-Term Action

MPI and HBRC to fund the establishment of the Whakaki Ecological Infrastructure Project. This could involve funding the development of a Project Design Framework for presentation at a Multi-Stakeholder Project Design Workshop. MPI and HBRC to also fund the subsequent development of Final Project Design for presentation of an MPI-funded Project Launch event. The Final Project Design would contain a budget and funding requirements from different funding sources, including co-financing by a range of government entities and the private sector.

Appendices

APPENDIX 1. CONSULTATION RECORD

Those consulted during the preparation of this Options Paper include the following:

Name	Organisation
James Palmer	Hawke's Bay Regional Council
James Powrie	Hawke's Bay Regional Council
Nathan Heath	Hawke's Bay Regional Council
Brendan Powell	Hawke's Bay Regional Council
Barry Lynch	Hawke's Bay Regional Council
Craig Little	Wairoa District Council (Mayor)
Jamie Cox	Wairoa District Council
Helen Montgomery	Wairoa District Council
Allen Smith	Wai Consultants
Christine Smith	Wai Consultants
Katarina Kawana	Wai Consultants
Brett Gilmore	Pan Pac
Keith Dolman	Hawkes Bay Forestry Group
Nick Caviale-Delzescaux	Whangawehi Catchment Management Group
Oliver Hendrickson	Ministry for Primary Industries
Kevin Steel	Ministry for Primary Industries
Elizabeth Heeg	Ministry for Primary Industries
Rebecca Lyon	Ministry for Primary Industries
Gillian Mangin	Ministry for Primary Industries
Annette Carey	Ministry for Primary Industries
Peter Lough	Ministry for Primary Industries
Maya Hunt	Ministry for Primary Industries
Tim Grafton	Insurance Council of New Zealand
Kay Harrison	Ministry for the Environment
Catherine Rusby	Business Hawke's Bay
Richard Barley	Melita Honey
Allan McPherson	Manuka Farming NZ

APPENDIX 2. KEY STAKEHOLDERS

Key stakeholders for a sustainable land management programme in Northern Hawke's Bay could include but not be limited to the following:

- Farmers
- Iwi
- Plantation Forestry Industry
- Manuka Honey Industry
- Catchment Groups
- Horticulturalists
- MPI
- Wairoa District Council
- Hawke's Bay Regional Council
- MFE
- Landcare Research
- Scion
- Business Hawke's Bay
- NZ Landcare Trust
- Beef + Lamb NZ