



Summary of the

Waiapu River Catchment Study

Final Report

MPI Information Paper No: 2012/09

ISBN No: 978-0-478-40449-4 (online)

ISSN No: 2253-394X (online)

November 2012

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Contents

Page

Key Messages	1
Background	2
Current status of erosion in the Waiapu catchment	2
Social, cultural, & economic aspects	4
Ngāti Porou's desired state for the catchment	5
Key findings and conclusions of the report	5
Proposed options for progressing towards the desired state	6

Key Messages

1. Erosion in the Waiapu catchment is of great spiritual, cultural, and economic significance to Ngāti Porou.
2. The Report confirms that rates of natural erosion and sedimentation are high in the Waiapu catchment and afforestation is the most effective method of controlling erosion. The total area of the catchment is approximately 174,000 hectares.
3. The Report estimates that effective treatment of up to a maximum of 28,000¹ hectares of highly erodible land (as at 2008) within the catchment is still required to address the erosion problem in the catchment and move toward achieving a desired state as envisaged by Ngāti Porou. This includes approximately 19,000 hectares grassland with a very severe to extreme erosion potential and approximately 8,000 hectares of the catchment areas surrounding gullies.
4. Gullies are responsible for approximately half of the sedimentation in the catchment and cover less than 1% of the catchment area.
5. The majority of the highly erodible land is in private ownership. The following table provides a breakdown of land ownership for the 19,000 hectares of the highly erodible land.

Tenure	Area (in hectares)
Crown land	350
DOC land	150
Māori title	6,000
General title	13,000

6. The East Coast Forestry Project (ECFP) and other government funded schemes have provided effective treatment over 54,000 hectares in the catchment. The ECFP's contribution is approximately 39,000 hectares.
7. The uptake of ECFP grants has been slow. Possible reasons for the slow uptake of the scheme include:
 - financial and economic barriers (e.g. bridging finance and comparative returns from pastoral farming);
 - complexity due to the multiple land ownership of Māori land;
 - limitations of the scheme (e.g. must establish in year of approval, covenants, restrictive forestry regimes, and compatibility with the ETS);
 - landowner perceptions of forestry and government (both central and local);
 - availability of information, support, and leadership; and
 - the absence of a co-management or co-governance model with Ngāti Porou;.
8. The Report proposes the following five options to address the erosion problem and to progress towards the Ngāti Porou desired state.
 - Option One: Afforest all gullies and their associated catchments.
 - Option Two: Afforest all ECFP target land.

¹ This number should be treated as indicative only as it is an estimate, based on a number of assumptions.

- Option Three: Afforest all ECFP target land plus all gullies and their associated catchments.
- Option Four: Afforest all Potential Erosion Severity 4 and 5 land.
- Option Five: Afforest all Potential Erosion Severity 4 and 5 land plus all gullies and their associated catchments.

Background

9. In October 2011, the Ministry for Primary Industries, in consultation with the Steering Committee, commissioned SCION to undertake a study of the erosion issues in the Waiapu catchment. In June 2012 SCION submitted the final report. The study investigated the geophysical, social, cultural, and economic dimensions of the erosion problem in the Waiapu River catchment. The study assessed the scope (size and scale) of the erosion problem in the catchment and evaluated the effectiveness of erosion mitigation measures. It also included possible options for addressing the erosion problem.

CURRENT STATUS OF EROSION IN THE WAIAPU CATCHMENT

10. About 19,000 hectares pasture land and approximately 8,000 hectares of other land surrounding the gullies (i.e. the entire catchments associated with (or surrounding) any gullies) are at risk of very severe or extreme erosion.
11. The Report uses the concept of **Potential Erosion Severity** (PES)² to assess the current status of erosion in the catchment. PES 4 and 5 areas make up 43% of the Waiapu catchment. *About two-thirds of the land with PES of 4 or 5 is already under vegetation cover (natural or planted forest cover) and approximately 19,000 hectares under low producing grassland.*
12. The following table shows the distribution of land under various PESs and land use class area (as at 2008).

² PES is a method of estimating erosion susceptibility in New Zealand. It uses the NZ Land Resource Inventory (NZLRI) and Land Use Capability (LUC) database. These erosion severities range from 0 (negligible) to 5 (extreme).

Potential Erosion Severity (PES) and land use class area

All areas are in hectares. Erosion severities are classified as UC-unclassified, 0-nil, 1-slight, 2-moderate, 3-severe, 4-very severe, and 5-extreme.

Land Use	UC	0	1	2	3	4	5	Total
Natural Forest Pre-1990	2	815	1,523	8,519	18,399	28,700	2,148	60,107
Planted Forest Post-1989	0	127	207	4,900	4,629	10,559	24	20,446
Planted Forest	0	386	314	6,277	4,684	11,476	149	23,287
Grassland with Woody Biomass	2	315	476	1,289	1,295	2,068	38	5,483
Grassland High Producing*	1	5,374	4,207	2,966	83	413	0	13,043
Grassland Low Producing	23	1,647	1,811	16,365	9,116	18,458	529	47,950
Other	33	2,500	343	43	99	353	129	3,500
Total	60	11,164	8,880	40,360	38,305	72,028	3,018	173,815

*Includes Cropland

13. Only about 3% of the catchment area has very severe or extreme (4 or 5) **Present Erosion Severity**³ and three quarters of this land is under natural or planted forest cover. Just over 1,200 hectares are under pasture as illustrated in the following table.

Present Erosion Severity (1995-1998) and land use class area (2008)

All areas are in hectares. Erosion severities are classified as 0-nil, 1-slight, 2-moderate, 3-severe, 4-very severe and 5-extreme.

Land Use	0	1	2	3	4	5	Total
Natural Forest Pre-1990	5,647	23,704	24,530	5,084	1,116	45	60,127
Planted Forest Post-1989	991	9,940	5,637	2,567	1,273	24	20,433
Planted Forest	1,387	8,036	8,033	4,064	1,695	76	23,291
Grassland - Woody biomass	815	2,075	1,781	669	143	2	5,485
Grassland - High Producing*	8,683	3,520	379	87	1	-	12,670
Grassland - Low Producing	4,490	21,447	13,634	7,157	1,142	71	47,941
Other	3,208	189	170	166	90	49	3,871
Total	25,220	68,910	54,164	19,795	5,461	267	173,817

*Includes Cropland

³ Present erosion severity measures the current status of erosion; not susceptibility.

14. Gully-derived sediment accounts for 49% of the annual suspended sediment yield. Current annual sediment yields from the Waiapu River are very large in comparison to other rivers in New Zealand.
15. Afforestation of general title land is largely being driven by commercial considerations, ECFP incentives, or mandatory requirements for planting of LO3A land, or combination of these. The uptake of treatment on privately-owned land is voluntary except in areas where it is required under the Gisborne Combined Regional Land and District Plan (i.e. LO3A). Afforestation of Māori-owned land is likely to be subject to a wider set of considerations, and the decision to reforest will probably involve more complex processes.

SOCIAL, CULTURAL, & ECONOMIC ASPECTS

16. The Waiapu catchment is of great spiritual, cultural, and economic significance to Ngāti Porou. The health of the catchment extends much further than the physical elements of the landscape.
17. Many Ngāti Porou consider that erosion is not an isolated problem and that integrated approaches are required to tackle the many problems the catchment faces. Future strategies should embrace Ngāti Porou values and aspirations fully.
18. Flood, sediment, and erosion damage to stocks and flows of critical natural capital compromises the ability of local people to meet their needs, especially with respect to abundant good quality seasonal food, fresh clean water, and other resources.
19. A lack of engagement in catchment management, decision making, and planning is perceived to be preventing the community from pursuing its own vision of the desired state for the Waiapu catchment and hindering community engagement in the resolution of the problem.
20. The present value of lost pasture productivity due to *slip erosion* is estimated at \$415,000 per annum in the Waiapu catchment. The value of lost pasture productivity due to *surface erosion* in the Waiapu catchment is estimated at \$440,000 per annum.
21. The Waiapu catchment faces many other costs as a result of soil erosion, through damage to infrastructure, insurance costs, recreational loss, and biological degradation. Some can be estimated but further research is needed to determine the full economic impact from soil erosion in the Waiapu.
22. The East Coast Forestry Project (ECFP), initiated in 1992, provides grants to landowners for erosion treatment. It has helped bring approximately 37,000 hectares under sustainable land management since its inception. The Gisborne District Council has a regulatory requirement to treat all erosion areas identified as LO3A.
23. The ECFP and LO3A do not have explicit social, economic, and cultural objectives. The number of indicators developed by the Report suggests that the challenges facing the catchment and its people are many and only a very small number of these are being addressed by current efforts.
24. The Report also finds that the uptake of ECFP grants has been slow though the scheme has achieved significant areas of afforestation, reversion, or wide-spaced tree planting. Possible reasons for the slow uptake of the scheme, as identified in the literature, include:

- Financial and economic barriers (e.g. bridging finance and comparative returns from pastoral farming).
- Complexity due to the multiple land ownership of Māori land.
- Limitations of the scheme (e.g. must establish in year of approval, covenants, restrictive forestry regimes, and compatibility with the ETS).
- Landowner perceptions of forestry and government (both central and local).
- Availability of information, support, and leadership.
- The absence of a co-management or co-governance model with Ngāti Porou.

NGĀTI POROU'S DESIRED STATE FOR THE CATCHMENT

25. The Report has developed the Ngāti Porou desired state for the Waiapu River and the catchment based on a limited consultation with Ngāti Porou. The desired state can be summarised as:

- Improved water quality and condition of the Waiapu River to:
 - enable the river to once again be used as a source of abundant food, drinking water, and for recreation;
 - contribute to the re-invigoration of the relationship between Ngāti Porou and the environment through an ability to interact more closely with the river;
- Restoration of the intimate relationship between Ngāti Porou and the river to:
 - enable greater responsibility for land use choices and the impacts of these on the river;
 - create economic opportunity through innovation and sustainable use of the resources of the catchment;
 - to ensure that future generations sustain and feed the connection between the people and the river;
 - to record and pass on oral history and mātāuranga connected with the river.
- Rangatiratanga over the river and catchment as kaitiaki with the ability to decide and influence the protection and sustainable use of the river through the use of mātāuranga.
- The protection of existing natural forest and the restoration of natural forests within the catchment to slow the erosion.
- Restoration of economic independence through the re-invigoration of sustainable economic opportunities based in the catchment.
- At least no further deterioration of the river and catchment from its current state.

KEY FINDINGS AND CONCLUSIONS OF THE REPORT

26. Rates of natural erosion and sedimentation are high in the Waiapu catchment. Deforestation during the late 19th and early 20th centuries has exacerbated the high natural rates of erosion and sedimentation. It resulted in a significant and growing erosion problem.
27. The Report estimates that the effective treatment of up to about 28,000 hectares of grassland within the catchment is still required to address the erosion problem and move toward achieving the desired state. If the area is not treated, sediment yields will continue to increase, as unplanted gullies continue to grow in size.
28. Research and experience confirm that land use/vegetation change is the most effective method of controlling erosion. Afforestation, reversion, and wide-spaced planted trees are all known to be effective in reducing erosion.

29. River cross-section data show that while some headwater streams where afforestation has occurred have begun to incise, larger rivers are still aggrading and their channels are continuing to widen.
30. The majority of the highly erodible land under grassland within the Waiapu catchment is in private ownership (general and Māori title). Therefore, the uptake of treatment will be voluntary except in areas where it is required under the LO3A.
31. The rate of uptake of existing incentive schemes (e.g. the East Coast Forestry Project) will need to be increased. The rate of uptake in the past has not been very high.
32. The gaps in existing knowledge limit SCION's ability to identify the amount, mix, and spatial distribution of erosion mitigation measures (afforestation, reversion, and wide-spaced tree planting) required to improve geophysical conditions sufficient to achieve the desired state as identified by Ngāti Porou.
33. Interventions to date, based on this brief and provisional assessment, have not fully addressed or embraced the aspirations of Ngāti Porou as far as can be assessed or reflected in their holistic view of the interconnectedness of the wellbeing of the community and environment — that the health of the river and the people are one.
34. Many Ngāti Porou seek mana motuhake over the river and catchment, and its restoration. This is supported by a view that the catchment needs a strategy that fully represents the aspirations and values of the community.
35. Any attempt to develop and implement interventions to address the erosion problem in the Waiapu catchment without the direct and active participation of Ngāti Porou and local communities is unlikely to be successful.
36. In defining future courses of action and interventions to reduce the erosion and its effects, it should be recognised that they may lead to undesirable as well as desirable socio-economic and cultural impacts. Future proposed catchment management policies or erosion control programmes will therefore require careful environmental and social impact assessment and be informed by the perspectives, values, and experiences of Ngāti Porou.

PROPOSED OPTIONS FOR PROGRESSING TOWARDS THE DESIRED STATE

37. The Report finds that afforestation leading to rapid canopy closure is generally expected to be the most effective approach to treating areas of eroding and erosion-prone land within the Waiapu catchment. Therefore, the Report proposes afforestation, as the default approach, to treat the areas involved. However, the Report recognises that a suitable mix of afforestation, reversion, and wide-spaced tree planting may offer acceptable site-specific solutions. The proposed options are:
 - Option One: Afforest all gullies and their associated catchments.
 - Option Two: Afforest all ECFP target land.
 - Option Three: Afforest all ECFP target land plus all gullies and their associated catchments.
 - Option Four: Afforest all Potential Erosion Severity 4 and 5 land.
 - Option Five: Afforest all Potential Erosion Severity 4 and 5 land plus all gullies and their associated catchments.