RANGAHAUA WHANUI NATIONAL THEME U

THE LAND WITH ALL WOODS AND WATERS

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WAITANGI TRIBUNAL

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LIST OF ABBREVIATIONS

AJHR	*Appendices to the Journals of the House of Representatives*
app	appendix
ch	chapter
doc	document
encl	enclosure
MA	Maori Affairs
MA-MLP-W	Maori Affairs – Maori Land Purchase Department – Wellington
NA	National Archives
NZPD	*New Zealand Parliamentary Debates*
p, pp	page, pages
pt	part
s	section (of an Act)
sess	session
vol	volume
Wai	Waitangi Tribunal claim

CHAPTER 1

OVERVIEW

> All was quite deserted; the land, the sea, the streams and lakes, the forests, the rocks, were deserted; the food, the property, the work, were deserted; the dead and the sick were deserted; the landmarks were deserted.[1]

The whenua guaranteed to Maori in the Treaty was the full estate, the land with its forests and rivers, its flora and fauna, its people whose ancestors were buried there. At 1840 each hapu had rangatiratanga over its whenua, that is, hapu were political units exercising autonomous resource management. The economy of each hapu was different. Ngati Kuri obtained the greater part of their livelihood from marine resources, trapping migrating kuaka on the strands of Parengarenga. Ngati Hine were forest and river people, weaving pouches from kiekie for the mokoroa caterpillars they used for eel bait. Hapu guarded land burnt for fern root and pits constructed for kumara storage because they regarded carbohydrate as the source of muscular strength. In the South Island, cabbage trees, fern root, and eels formed a staple diet, complemented by an abundance of bird life, while North Island tribes hunted kereru and kaka with an intricate technology. In no hapu, however, was agricultural land the predominant economic resource prior to the formation of capital markets.

Many New Zealand birds and fish secured their existence by ranging over territory greater than any hapu controlled. Kuaka migrate from Siberia; pipiwharauroa migrate from the tropical Pacific; kereru move between mountain and lowland forests; koaro, inanga, piharau, and tuna migrate into estuaries from the sea and travel through lowland swamps into mountain terrains. Sustained harvests depend, therefore, on tracts of forest and wetlands retaining the integrity to recover from human and natural disturbance. Maori achieved this as long as forests and swamps predominated over the portion of land burnt for fernland and cleared for agriculture and settlement. From 1840, however, the Crown's objective was to remove the forest to expedite the colonising economy and settlement. The Crown's allegiance was to England, not to its Maori partner.

From 1840, some hapu participated prosperously in two systems of knowledge, technology, and harvesting:

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1. Governor Gore Brown, 1860, quoting a letter composed by two chiefs to the people of Taranaki. This description delineates some components of whenua remaining after the departure of able-bodied men and women (Turton, 1883, Appendix F, p 31).

> Up-river, at Totoro and Kaiwaka and about Mahoenui the people grew wheat and all manner of other crops; they ground the wheat into flour in their own water-mill, and down at the heads they did the same. The harvest of the waters, too, they gathered in abundance. The fishing canoes, large and small, were out every day in the summer; the long flax seines were drawn in the estuary; the beaches were fragrant to the Maori nostril with long lines of shark drying in the sun, and snapper and other fish were smoke-cured in tons. Up-river there was the tuna, the eel . . . The Mokau and its creeks were famous for the silvery eels, which came along in enormous numbers in March and April especially. There were pa-tuna – eel-weirs – in every stream and at every place where a swampy watercourse emptied its brown waters into the main river. There was the harvesting of the wheat and the maize besides the usual mainstays of life, the potato, and in all this work the communal system of the tribe was at the apex of its value.[2]

In some respects there was a fine exchange between Maori and Pakeha. In 1838 a hive of honey bees was introduced at Hokianga. The bees shortly went wild, and established colonies in Northland forests. Maori responded by gathering the honey from hollow puriri trunks, and incorporating honey bees into the classification of forest fauna, as ngaro, a group which includes pollen-gathering native flies, native solitary bees, hover flies which hum harmoniously (ngaro paira), and spider-hunting wasps which buzz as they build mud cells for their prey (ngaro wiwi).

Some old people in Northland still use the original name given to honey bees, ngaro rere rangi, after their habit of rising high into the sky. Other families class honey bees with native stinging bush flies and call them all ngaro ngahere, while some have adopted Pakeha usage and call them hone or pi hone, from 'honey bee'. Nineteenth-century hives were woven from wickerwork, a skill at which Maori were adept. As beekeeping spread, Maori beekeepers developed a reputation for the craftsmanship of their hives and for their beekeeping skills.

Meanwhile, Pakeha settlers on the West Coast of the South Island, arriving with traditions of angling and netting, found shoals of migrating whitebait that 'covered the face of the waters' for miles in length; shoals several hundred feet long and varying from three to six feet in width were not uncommon sights as late as 1890.[3] Settlers responded by adopting Maori fishing technology.

Maori trap inanga both on their upstream migrations in spring, when they travel in vast shoals of multi-specied whitebait, and on their more hidden downstream migrations in autumn, when they return to estuaries to spawn, rich with roe. For Pakeha, however, the whitebait fishery has been overwhelmingly a capture of incoming shoals of transparent juveniles.

Maori fishing technology includes a range of diversion channels cut through S-bends and shingle banks, and weirs built out into the channel to deflect migrating

2. J Cowan, *Tales of the Maori Bush*, Dunedin (etc), A H & A W Reed, 1934, pp 64–65. Cowan is describing the Mokau River in Taranaki around the time when the ariki Wetere Te Rerenga died and was succeeded by his brother, the ariki Rangituataka.
3. G G M Mitchell, *Maori Place Names in Buller County*, Wellington, Reed, 1948, p 45; R M Mcdowall, *The New Zealand Whitebait Book*, Wellington, Reed, 1984, p 99. McDowall undertook a comprehensive search of the fisheries sources cited in this report.

shoals into woven traps. Each trapping method is suited to a local configuration of river and fish movement, and each trap has its own technical vocabulary (hinaki, kaka, koumu, pakau, and so on). Pakeha whitebaiters amalgamated elements of this technology into a method they called simply the 'trench'. This comprised a low dam built out into the river channel, often constructed from sacks filled with gravel. Set nets were placed at intervals, in gaps in the dam. Fish swimming upstream followed along the wall to the find the flow through a gap.[4]

By the 1860s Pakeha had joined Maori in selling whitebait commercially – sixpence a pint in Greymouth.[5] During the 1870s Chinese goldminers trapped, dried, marketed, and exported whitebait.[6] Commercial canning of whitebait by Pakeha began at Hokitika in 1891.[7]

In 1894 the Crown introduced regulations affecting whitebait harvesting.[8] The regulations prohibited use of diversion channels and 'trenches' – essential elements of Maori fishing technology:

> No scrim or whitebait net shall be used as a set net or be set or placed in openings made in the banks of rivers or streams or in dams constructed therein . . .[9]

With successive regulations, other aspects of Maori technology were outlawed, such as drafting fish towards the trap; and closed seasons were imposed, transferring control of the fishery to the Crown. All the while, commercial canning of whitebait by Pakeha enterprises – Irvine and Stevenson, Nolans, E C Frost – continued largely unregulated, the impact on the fishery passing unresearched.

By the 1920s the Chief Inspector of Fisheries, A E Hefford, was commenting dourly to the Marine Department: 'The regulations made in the past have been mainly for the purpose of adjusting matters between competing fishermen rather than from the point of view of conservation of the stock'.[10] In 1927 the Marine Department conceded that depletion of the whitebait fishery had been 'almost universal'.[11] The love affair had become a bitter loss of harvest.

In following the background to the Wai 262 claim it is next necessary to understand that from the 1870s on, the loss of harvest was observed, reported, and publicly debated as it happened, decade by decade, river by river. Upokororo (grayling) had been observed to 'assemble in the streams in immense numbers'.[12] In 1869 they were so abundant in one river that a mill wheel was brought to a

4. McDowall, *The Whitebait Book*, pp 139–140
5. C J Pfaff, *The Digger's Story*, Wellington, Wright and Carman, 1914, p 9; C Hunt, *Speaking a Silence*, Wellington, Reed, 1981; McDowall, *The Whitebait Book*, pp 98, 102
6. *West Coast Times*, 14 December 1875; R C Reid, *Rambles on the Golden Coast of the South Island of New Zealand*, London, Colonial Publishing and Printing, 1884, p 174; McDowall, *The Whitebait Book*, p 100
7. McDowall, *The Whitebait Book*, p 103
8. Whitebait Fisheries Regulations 1894, 1896
9. McDowall, *The Whitebait Book*, pp 129, 140
10. R M McDowall, *New Zealand Freshwater Fishes: A Natural History and Guide*, Auckland, Heinemann Reed and MAF Publishing, 1990, p 130, quoting Marine Department files
11. McDowall, *The Whitebait Book*, p 188
12. J Hector, 'Notes on the New Zealand Whitebait', in *Transactions and Proceedings of the New Zealand Institute*, vol 35, 1903, pp 312–319

standstill.[13] By 1874, upokororo had disappeared from the Waikato River.[14] By 1884 upokororo were 'by no means' any longer common in Otago rivers,[15] and in 1910 their disappearance from the Inangahua and Buller Rivers was announced.[16] Upokororo were last seen in the 1920s, in streams and rivers remote from Pakeha settlement.[17]

Many factors coincided to bring about the loss of harvest, but for a while scientists and public pinpointed isolated aspects of the colonial enterprise.

Trout were introduced during the 1860s, and by the 1920s Maori and Pakeha commentators had connected fishery declines to colonisation of streams with a new, predatory fauna. Whitebaiting interests wrote to the papers: 'whitebait is being eaten out of New Zealand rivers by stocking them with imported trout to provide sport for comparatively few people'.[18] Canning interests protested to the Marine Department that trout 'will finish the whitebait as they have the greyling.'[19] Maori had made submissions to the Rotorua Town Board as early as 1897, advising that stocking the central plateau lakes with trout was destroying their koaro fisheries.[20]

Over-exploitation was pinpointed: 'Commercial interests are ruling in the whitebait industry'.[21] Further whitebait canneries were opened during the 1930s,[22] and Taranaki Maori made representations 'in regard to the fishing of whitebait by Europeans and to the decrease in supplies'.[23] Sometime in 1940 the Marine Department commented that 'it is undoubtedly the high cash value of whitebait that induces' over-exploitation.[24]

Impacts of an agricultural economy were recognised. Decline in populations of waikaka (mudfish) were attributed to forest clearance and swamp drainage.[25] Whitebait declines were attributed to loss of inanga spawning grounds, through trampling by stock and replacement of indigenous forest cover with introduced trees. In 1932 Captain Hayes advised the Marine Department:

> known spawning grounds should be fenced off . . . there are in many places areas of swamp which are of little or no value to agriculture, and in which permanent lagoons which would accommodate considerable numbers of inanga might be formed.[26]

13. B G Moss, 'Upokororo, New Zealand's Mystery Fish', in *Ammohouse Bulletin*, vol 1, no 5, 1958, p 5
14. E Best, *Fishing Methods and Devices of the Maori*, Wellington, Dominion Museum Bulletin, 1929, p 212
15. W Arthur, 'On the Brown Trout Introduced into Otago' in *Transactions and Proceedings of the New Zealand Institute*, vol 16, 1884, pp 467–512
16. J Drummond in *Otago Daily Times*, 23 March 1910
17. W J Phillipps, 'Life-history of the New Zealand Grayling', in *New Zealand Journal of Science and Technology*, vol 6, no 2, 1923, pp 115–117
18. *Otago Daily Times*, 6 March 1922
19. McDowall, *Natural History*, p 86
20. P J Burstall, 'Trout Fishery: A History of Management', in D J Forsyth and C Howard-Williams, *Lake Taupo: Ecology of a New Zealand Lake*, New Zealand Department of Scientific and Industrial Research, 1983, pp 119–131
21. D Hope in *The Press*, 5 September 1928; McDowall, *The Whitebait Book*, p 185
22. McDowall, *The Whitebait Book*, p 103
23. *Taranaki Herald*, 5 May 1930
24. McDowall, *The Whitebait Book*, p 186, citing Marine Department files
25. W Martin, *New Zealand Nature Study*, 'Volume 1 – The Fauna', Whitcombe and Tombs, [1929] p 173
26. McDowall, *The Whitebait Book*, pp 183–184

Spawning areas on the Manawatu River were fenced; otherwise McDowall could find no record of the Minister of the Marine Department responding to the advice. In sum, habitat was 'greatly diminished in the course of civilised settlement by the drainage of swamps and lagoons and their conversion into agricultural lands'.[27] Later, fisheries scientists attributed declines to indigenous forest clearance, noting that in occasional streams not modified by agriculture and pine forestry, koaro may still be found in dense populations.[28]

Lack of action from the Government and lack of research also received comment: 'The native fishes except those that are of economic value and subject to fisheries regulations are entirely unprotected'. There was a call for 'the cessation of chaotic and blindfold fishery control'.[29]

During the 1920s the voices of fisheries scientists combined with public opinion (expressed through the media) to distil acclimatisation, over-exploitation, lack of research, and destruction of habitat as salient factors in the loss of harvest.

It is next necessary to understand why, as the indigenous flora and fauna declined, representations by Maori and advice from scientists were not heeded. Here we encounter 'an incompatible and entirely unequal set of competing interests'.[30] Declines of indigenous flora and fauna had been accompanied by lively public debate; the problem was not with lack of awareness but with Crown bias. Nowhere, geographers comment, has acclimatisation been more extensive than in New Zealand.[31]

From 1867, acclimatisation societies were mandated by statute to secure the establishment of introduced flora and fauna.[32] In 1890 the Otago Acclimatisation Society reported destroying 1880 eels from the Waipahi Stream to protect stocks of trout,[33] and in 1929 the societies proposed a commercial eel fishery as a way of further protecting trout fisheries.[34]

Whitebait fisheries were also to be compromised in the interests of trout. With trout predation of whitebait now widely discussed, in 1922 the Southland Acclimatisation Society proposed: 'the taking of whitebait has grown to such proportion as to have a serious effect upon Trout . . . restricting the Whitebait Season to three months would be beneficial to the trout fishing'.[35] By 1916

27. McDowall, *The Whitebait Book*, pp 183–184
28. McDowall, *Natural History*, pp 105, 109
29. G Stockell, *Wild Life Control. Defects in Present Scheme Exposed. Some Constructive Suggestions*, Wellington, Blundell, 1941
30. R H Grove, *Green Imperialism*, Cambridge University Press, 1995, p 265
31. M M Roche, *Forest Policy in New Zealand*, Palmerston North, Dunmore Press, 1987, p 44, citing *Nature*, vol 6, 1872, p 219; N V Pears, 'Familiar Aliens: The Acclimatisation Societies' Role in New Zealand's Biogeography', in *Scottish Geographical Magazine*, vol 98, no 1, 1982, pp 23–34
32. Animals Protection Act 1867, 'An Act to provide protection of certain animals and for the Encouragement of Acclimatisation Societies in New Zealand'. Animals Protection and Game Act 1921–1922. Wildlife Act 1953. Conservation Law Reform Act 1990 (acclimatisation societies replaced with fish and game councils).
33. R M McDowall, *Gamekeepers for the Nation: The Story of New Zealand's Acclimatisation Societies*, Christchurch, Canterbury University Press, 1994, p 120
34. McDowall, *Gamekeepers for the Nation*, p 122
35. McDowall, *The Whitebait Book*, pp 176–177

acclimatisation societies had released around 50 million brown trout into New Zealand waterways.[36] The whitebait industry supported low-income households, Maori and Pakeha,[37] and during the 1920s speakers for the whitebait fishers stated the issue. Some went directly to Government: 'a choice should be made between trout for the privileged few . . . or an industry employing 2000 including pensioners and disabled'.[38] Some went public: 'whitebait is being eaten out of New Zealand rivers by stocking them with imported trout to provide sport for a comparatively few people'.[39]

In the Freshwater Fisheries Act 1983, acclimatisation societies wrote their own statute,[40] prompting a fisheries scientist to comment dourly that a body with interests in acclimatised game fish had been given responsibility for managing the habitat of native fish: 'No other agencies in New Zealand have ever been to the same extent self-regulating in a statutory sense, with such minimal government oversight' nor elected by such an 'exclusive user group' who are the sportsmen 'controlling the management of the resources they exploited'.[41]

In 1967 the Water and Soil Conservation Act accorded management of rivers to regional Water Boards and Catchment Boards, and accorded to the boards the ability to issue themselves with general authorisations. The boards are 'dominated by sectional interest groups, in particular, farmers'.[42] In 1977, the boards were criticised for the 'insidious whittling away of the freshwater fisheries . . . by thousands of individual rights to take water from our rivers and streams'.[43] In 1980 aquaculture scientists voiced their exasperation: 'In New Zealand [hydro-electric] schemes have been planned by government which . . . did not impose habitat restoration on itself'.[44] In 1983, during discussion of a National Conservation order to protect the Rakaia River from water abstraction for irrigation, the chairman of the Hearings Committee stated, 'The critical factor in this hearing is irrigation', that is, not wildlife and fisheries.[45] In 1990, a fisheries scientist commented: 'Sometimes the Crown seriously oversteps the mark' in failing to protect rivers and river flows.[46]

It is next necessary to ask how the interests of an extractive economy can override the interests of an indigenous people.

During 1993 the Waikato Regional Council (Environment Waikato) received an application from Coeur Gold New Zealand Ltd for a water permit (930923) and a discharge permit (930924) for drilling at Waitekauri. The application was opposed

36. G M Thomson, *The Naturalisation of Animals and Plants in New Zealand*, Cambridge University Press, 1922, p 215
37. In the 1930s ca 95 percent of whitebaiters on the Waikato were Maori (McDowall, *The Whitebait Book*, p 92).
38. McDowall, *The Whitebait Book*, p 45, citing Marine Department files.
39. *Otago Daily Times,* 6 March 1922
40. McDowall, *Gamekeepers for the Nation*, p 59, citing the Fisheries Act, 1983.
41. McDowall, *Gamekeepers for the Nation*, pp 18–23, 32
42. McDowall, *Natural History*, p 479
43. Ibid, p 505
44. P Dinamani and R W Hickman, *Proceedings of the Aquaculture Conference*, Fisheries Research Division, Occasional Publication, no 27, Wellington, New Zealand Ministry of Agriculture and Fisheries, 1980, p 44
45. McDowall, *Natural History*, p 477
46. Ibid, p 479

by Moehau Nga Tangata Whenua Trust Board, and by Te Ruunanga a Iwi o Ngati Tamatera. The water permit covered water extraction from 13 rivers and streams and their tributaries, in regenerating native forest. The discharge permit covered discharge of drilling materials. During 1996 Mr Ohomauri Mataia Nicholls, Mr Pitau Williams, and Mr Tewiremu Matai (Nicholls) made submissions stating that the intrinsic value of water could not be compromised for extrinsic, human, monetary values:

> They considered that the waters of the application area are of highest value and that this must be considered in relation to the entire area which contains these waters and which contributes to the essential nature of these waters. Protection of the 'whole' environment is necessary to protect the values of these waters. Ngati Tamatera considered that without a holistic approach, their Kaitiakitanga responsibilities to protect the overall intrinsic values of the ecosystem could not be appropriately exercised.

The Waikato Regional Council Hearings Committee decided:

> the stated purpose of the [Resource Management Act 1991] is to promote the sustainable management of the natural and physical resources . . . [and is] not an Act designed to protect and conserve natural and physical resources at all costs, but an Act with the express intention of facilitating the use of such resources in a sustainable way.

The Hearings Committee granted the resource consents sought by Coeur Gold.[47] The majority decision of the committee was:

> They do not believe allowing the activity under the restrictions placed by the Mining Licence and the conditions placed on this consent compromise the principles of the Treaty of Waitangi or any claims currently under consideration by the Waitangi Tribunal.[48]

Whether Maori participated or did not participate and benefit from acclimatisation, timber milling, forest clearance, swamp drainage, water extraction, mining, and stock retention, the Crown had already vested its own interests in an extractive economy, through legislation which conferred rights explicitly on those who cleared forest and 'cultivated' land, and not in its partnership with an indigenous people. Against Maori interests in indigenous flora and fauna, New Zealand statutes encouraged clearance of native forest through timber licensing regulations; encouraged planting of exotic plantations through the Forest Trees Planting Encouragement Act 1871; and revoked 623,257 acres of state forest lands for settlement purposes between 1890 and 1919.[49]

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47. Environment Waikato, ref 60 14 20A. The hearings took place at Paeroa on 27 and 28 May 1996, and were reconvened on 18 September 1996 'for presentation of the results of the consultation with tangata whenua'. The resource consent was dated 23 October 1996.
48. Councillor Livingston stated that granting the applications would contradict section 2.1.5. of the Act, 'Tangata whenua relationship with natural and physical resources'.

It is finally necessary to understand that forest cover provided the nursery conditions which secured the phenomenal abundance of freshwater fisheries up to 1840,[50] and that the greater part of Maori harvests from forests and fisheries were derived not from the mountain forests but from the lowland swamp-forests. However, the warm, berry-rich, bird-rich lowland forests occupied the plains intended by Pakeha for clearance for an agricultural economy.[51] From the perspective of historical geographers, what took place was a 'cultural confrontation between a land-hungry colonial state and an indigenous culture' whose economic base was the land with all its woods and waters.[52]

Roche comments that the 'prevalent view was of indigenous forests as providing a transitional landscape for a sawmill industry and generally as a hindrance to the progress of settlement'.[53] In 1841 the British Colonial Land and Emigration Office sent advice to the Colonial Office:

> to reserve the forest is to reserve the land, with whatever object it is made Crown Reserves of land in a new Colony are in our opinion impediments to the progress of settlement and hurtful to the interests of settlement.[54]

On the signing of the Treaty the lowland forest, which had long sustained Maori harvests from flora and fauna, was to yield a final crop.[55] In the deed of sale negotiated at Mokau in 1854, between Ngati Pehi and the Chief Land Purchase Commissioner, Donald McLean, the terms were those of an extractive economy:

> There is no reserve whatever in this land now entirely given up by us to Victoria the Queen of England under the shining sun of the present day for ever and ever with all its Lakes, rivers and waters as well as all its trees all its stones and everything either above or under the land and every thing connected with it now surrendered by us for ever.[56]

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49. Roche, pp 50–51, 96
50. McDowall, *Natural History*, p 331: 'loss of forest cover from the catchments of many New Zealand waterways has had profound effects on the fish fauna.'
51. G Park, *Nga Uruora / The Groves of Life: Ecology and History in a New Zealand Landscape*, Wellington, Victoria University Press, 1995
52. Grove, p 265
53. Roche, p 88
54. Roche, p 21, quoting Colonial Land and Emigration Office to Colonial Office, 7 January 1841, No 8, Enclosure 2 G 1/1.
55. Roche, p 23
56. Park, 1995, pp 132–137

CHAPTER 2

RESOURCE RIGHTS

2.1 The Wai 262 Claim

In 1769 the mature kahikatea forests on the plains of Hauraki yielded to Maori a sustained harvest of berries and birds, timber, cordage, matting, clothing, materials for housebuilding, weapons, utensils, canoe construction, torches, cosmetics, and medicines.[1] Roche, examining colonial forest policy, concluded that from 1841 the Crown regarded New Zealand forests as a single valuable crop.[2] Forests which had recycled for the duration of Maori occupation, disappeared in less than 100 years. The Wai 262 claim is about control of indigenous resources for the harvests and the economic return they yield.

Among the concerns of the Wai 262 claimants is the Crown's current policy of resource management. The statement of claim made in 1991 reads:

> 1. In 1840 the Iwi of the named claimants exercised manawhenua over all of the land in the following regions . . .
>
> 2. Within those regions they exercised te tino rangatiratanga to protect and ensure the economic, political, social and cultural welfare of their people, and to conserve and manage the resources which they controlled in their whenua and kainga.
>
> 3. Today they exercise very little effective authority in relation to the welfare and protection of their people, and they have been excluded from and denied access to, and control over, the resources of their whenua and kainga.
>
> . . . . .
>
> 5. They have, in effect, been dispossessed of a major spiritual, cultural and scientific resource in te ao turoa, and alientated from an important economic and sustaining resource in their mahinga kai.[3]

Several philosophies of resource management are currently debated in New Zealand. A philosophy of preserving biodiversity, adopted by the Department of Conservation, aims to preserve New Zealand's ancient Gondwanaland flora and fauna as a bank of genetic resources. Indigenous flora and fauna are kept apart from

1. G Park, *Nga Uruora/Groves of Life: Ecology and History in a New Zealand Landscape*, Wellington, Victoria University Press, 1995, pp 27–31
2. M M Roche, *Forest Policy in New Zealand*, Palmerston North, Dunmore Press, 1987, p 23
3. From the statement of claim received by the Waitangi Tribunal, 9 October 1991.

human interaction on offshore refuges, and protected from interaction with acclimatised species.[4]

A philosophy of eco-system restoration has developed out of third world critiques of western resource management, and is a dialogue between ecologists and indigenous peoples. It aims to restore an indigenous character to the landscape, and implies restructuring of industrial societies, and limitations to the power of capital enterprises.[5]

A philosophy of kaitiakitanga proposed by Maori regards the natural world as part of the social universe; wildlife can be beneficially stimulated by human caretakership, and the abundance harvested.

2.2 PRESERVING BIODIVERSITY

During the twentieth century, as collapses of ecosystems, sudden declines of populations, and extinctions of species, have been observed globally, New Zealand scientists attempted to persuade Government that preservation of habitat was a neccessary strategy to secure the survival of indigenous flora and fauna. By the 1980s entomologists at the Department of Scientific and Industrial Research had estimated that New Zealand has 20 thousand species of native insects and terrestrial arthropods, with beetles comprising 50 percent of the known New Zealand insect fauna.[6] Most indigenous beetles are confined strictly to native forest:

> Before man began destroying the original vegetation, the Auckland area was clothed almost totally in forest . . . as Dr Kuschel has found in his Lynfield survey, over 94 percent of the 646 species of native beetles do not occur outside the forest. Apparently they cannot adapt even to gardens in which there are a substantial number of native trees and shrubs growing. The remaining 6 percent are mostly species such as tiger beetles (*Neocicindela tuberculata*) adapted to open country . . . These figures serve to emphasise the total dependence of most native beetles on forest cover for survival.[7]

Fisheries scientists had established that two of the whitebait species, koaro, *Galaxias brevipinnis*, and banded kokopu, *Galaxias fasciatus*, disappear from streams where ever indigenous rain forest has been cleared, but abound in streams where margins remain forested.[8] The forest controls light quality and water quality; it provides nourishment for the insects and snails native fish feed on. When forest is cleared for pasture, the water warms from exposure to light; it becomes laden

4. For example, the Department of Conservation has asked people to remove their baches from Rangitoto Island. Department of Conservation scientists have won world attention for their vermin eradication techniques, and for recovery programmes such as the Chatham Islands black robin.
5. R E Grumbine, 'What is Ecosystem Management?' in *Conservation Biology*, vol 8, no 1, 1994, p 34
6. J C Watt, 'New Zealand Beetles' in *New Zealand Entomologist*, vol 7, no 3, 1982, p 216
7. J C Watt, 'Beetles (Coleoptera) of Auckland' in *Tane*, vol 29, 1983, pp 31, 32
8. R M McDowall, 'Designing Reserves for Freshwater Fish in New Zealand', in *Journal of the Royal Society of New Zealand*, vol 14, no 1, 1984, pp 18–19

with silt and chemicals from farming practices; stock destroy overhanging plants along banks and break down the banks where koaro and kokopu hide and forage. When natural streams are turned into drains, culverted, and dredged, indigenous fish lose their habitat.

Forestry scientists had established that most North Island forest remnants were approaching sudden decline.[9] Acclimatised stock (cattle, sheep, goats, pigs) had eaten out understories, destroying the future regeneration of the forests, and opening up the forests to draughts which dry out leaf litter, destroying the habitat of ground insects. Acclimatised animals – rats, stoats, ferrets, weasels, rabbits, deer, possums – were destroying flora and fauna faster than they could regenerate. Introduced birds and insects had penetrated the forests, and were out-competing native fauna for food resources. Wasps and possums were eating berries before they were ripe enough for native birds to eat; wasps were competing with birds for caterpillars and other insects.

In 1992 New Zealand signed the United Nations Convention on Biological Diversity. The convention became the statutory basis of resource management and conservation policies administered by the Department of Conservation. From this perspective, some New Zealand scientists felt that the fight to save mainland flora and fauna was already lost, and on this advice the Department of Conservation adopted a strategy of creating refuges on offshore islands, where indigenous vegetation is being restored and acclimatised species eradicated. This predator-free habitat will provide circumstances for survival of species, sub-species, and strains:

> The near-shore and off-shore islands have become a critical element in conserving New Zealand's biodiversity . . . The concept of using islands as refuges for species that may otherwise be doomed . . . is a fundamental component of conservation in New Zealand.[10]

When the New Zealand Government restated its strategy of habitat preservation as a policy of preserving bio-genetic diversity, it allied with a global discourse. State science has its basis in philogenetic evolution: life forms are named and classified so as to record a search for the origins of life on the basis of genetically defined species. Alpha-systematics, using observed physical features, has been supplanted by molecular (DNA) determination of genetic blueprints, and on this basis the Crown has accorded legal protection to two species of tuatara, and to two strains in one of the species. In effect Crown policy maintains a bank of genetic resources:

> In recent years concern has grown worldwide that the natural genetic variability and knowledge of traditional uses of plants be safeguarded to prevent their loss to humankind. Out of this has sprung the Commonwealth Science Council's Biological

9. K R Hackwell and D G Dawson, 'Designing Forest Reserves', in *Forest and Bird*, vol 13, no 8, 1980, pp 8–15
10. R Barker and P Simpson, *Developing a National Strategy for Ecological Restoration*, Wellington, Department of Conservation, Discussion paper, 1995, p 2

Diversity and Genetic Resources Project. In New Zealand/Aotearoa the DSIR has accepted the responsibility of implementing Project aims.[11]

Expenditure on a policy of preserving biogenetic diversity is accounted for as a safeguard against future contingencies when new medical cures may be found in the genetic resources of plants and animals, when specialised breeds of commercial crops and livestock may be backbred to counter disease,[12] and when changes in climate may give advantage to species other than those currently selected for commercial use. Crown research institutes support research on genetic engineering, and participate in the copyrighting of genetic resources.

Indigenous peoples have challenged this account. As large tracts of colonised landscapes are cleared of species-rich forests and wetlands, a small range of domestic animals and plants has come to occupy a disproportionately large territory, in the interest of a western economic system which indigenous peoples describe as 'selfish and destructive'.[13] A policy of preserving biodiversity collaborates with, rather than challenges, the Government's investment in its current economic policy.

Under Department of Conservation policy, wild native species are preserved for future use as a genetic resource, and removed from present use as a harvesting resource. The landscape is partitioned. The Department of Conservation creates off-shore refuges, while global markets and capital determine the development of the mainland landscape (such as drainage of swamps and conversion of scrubland to pasture on privately owned farmland, mining in the conservation estate).

Thus a resource management policy based on protecting biodiversity supports the Government's investment in particular systems of science and economy, and fulfils its commitments under the International Convention on Biodiversity, 1992. Maori however harvest natural resources for sustenance, commerce, trade, and presentation at ceremonial feasts.[14] While preserving biodiversity retains flora and fauna which has its origins in Gondwanaland, 70 million years ago, the policy does not address achieving sustainable harvests for human society. Further, to Maori, the history of their landscapes is a history of interaction amongst themselves and all life forms in a changing world, te ao hurihuri. Hence Maori value specific localities as places of ancestral history and healing force (marae, wahi tapu, urupa), as places of abundant harvest (mahingakai), as places of economic resource (an eel-weir, a whitebait-run, a quarry, an ochre source, gardening soil), and so on. The land is partitioned by a different geographical paradigm.

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11. D Scheele and G Walls, *Harakeke, the Rene Orchiston Collection*, Havelock North, Department of Scientific and Industrial Research, Botany Division, 1988, p 3
12. The genetic base and the number of species is currently so narrow that agricultural economies require back-up stocks of wild species to be viable, should they be challenged by climate change, disease, hybrid sterility, or resistence to pesticides. Agricultural scientists have outwitted nature by selective breeding, and outwitted time by genetic engineering.
13. World Ecology Summit, 1996
14. H Beattie, *Tikao Talks: Traditions and Tales told by Teone Taare Tikao to Herries Beattie*, Auckland, Penguin Books, 1990, pp 140–141

2.3 ECO-SYSTEM RESTORATION

Eco-system restoration is based on a vision of the landscape as comprising eco-systems, each of which contains a different diversity of life forms: coastal forests, lowland forest-swamps, dunelands, natural shrublands, wetlands, lowland grasslands, alpine herbfields, off-shore islands, pasturelands of ryegrass and clover, and so on. The aims are to re-establish an indigenous character to the landscape, and to restore past ecological processes so the natural world again produces an abundant harvest.[15]

Grumbine has characterised the goals of ecosystem management as:

(a) maintaining viable populations of all native species in situ (protection of habitat, protection of biodiversity);
(b) representing, within protected areas, all native eco-system types across their natural range of variation (ecological representativeness);
(c) maintaining evolutionary and ecological processes such as nutrient cycles, and use of fire (ecological restoration);
(d) recognising that pigeons and whales have evolutionary needs, such as viable populations and corridors to move through to reach seasonal resources, equally with humans; and
(e) valuing eco-systems as living systems to which respect and admiration is due (stewardship).[16]

Under eco-system management, the state of the ecosystem determines what use may be made of natural resources for human goods and services. In Maori terms, a rahui may be placed on a locality until the habitat has been restored; stewardship (kaitiaki) of eco-systems may be translated as recognition of the mauri of the natural world, and so on.

Achieving self-sustaining habitat for indigenous flora and fauna possibly invites legislation for: reduction in the area allocated to pastoral farming; constraint of capital development and urban-industrial expansion onto good soils; cessation of cutting firewood (and other activities) on marginal lands; scrublands acting as nurseries for regenerating native vegetation and as refuges for surviving animals; cessation of indigenous forest felling; restricting stock to pasture lands; fencing of forest stands; fencing of the Queen's chain; coastal management; and pest management.

Many statutes protecting wildlife habitat have been drafted without consulting Maori; existing statutes are not being enforced. For example, the Fisheries Act 1983 requires freshwater fish to have uninterrupted passage along waterways, but farmers, regional councils, and hydro-electric companies have not been required to conform with the legislation. Private companies, representing Maori and Pakeha interests, are transforming extensive areas into pine plantation, a monocrop which creates an ecosystem antithetical to 90 percent of the indigenous flora and fauna.[17]

15. 'Where once we thought endangered species were the problem, we now face the loss of entire ecosystems' (R F Noss, E T Laroe, J M Scott, *Endangered Ecosystems of the United States*, Washington, United States Fish and Wildlife Service, 1994).
16. Grumbine, pp 31, 34

Further, Maori cosmology projects a different set of ecosystems: Tumatauenga, domain of human society and mastery of fire and stone-napping; Tanemahuta, domain of forest biota; Tangaroa, domain of aquatic biota; Rongomaraeroa, domain of cultivated and stored crops; Haumiatiketike, domain of staples (bracken fernroot, flax, koromiko, nikau, ponga, edible ferns); Tawhirimatea, domain of physical forces.[18] Conventionally in the Pacific, politically inconvenient gods are dispatched to the underworld (the abode of gods whose work is finished), or are subjected to restructuring. The domain of Tane may encompass willow trees, peach trees, pine trees, chestnut trees, and valuable new tree crops; or it may be a zone of ecological inter-connectedness in which pine trees are intrusive, according to resource management philosophy. It is likely that tussocklands, flax swamps, and fernlands (domain of Haumiatiketike) were prevented from reverting to forest through periodic burning; Maori do not separate themselves from the natural world.

2.4 MANAWHENUA/KAITIAKITANGA

In 1840 the whenua of each hapu provided resources which sustained its existence. Maori society, with its allocation of whenua amongst the many hapu, was itself a system of resource management. Each hapu had authority over its own whenua. Property rights were resource management rights:

> Forests in the wildest part of the country have their claimants. Land apparently waste is highly valued by them. Forests are preserved for birds, swamps and streams for eel-weirs and fisheries . . . Over the uncultivated portions of territory held by a tribe in common every individual member has the right of fishing and shooting.[19]
>
> It was a custom with the Maoris in ancient times to eat the rat – a rat indigenous to this country, and caught in traps set on the top of the mountain-ranges. This was a source of part of their daily food, and it was, therefore, with them a point of great importance to occupy every available portion of their lands with these traps, and as most of the tribal boundaries are along the range of the highest hills or mountains, and as these were the common resort of the rat, every New Zealand chief soon naturally became acquainted with the exact boundary of his land claims.[20]

Resource management by hapu is sometimes described as an ethos of 'kaitiakitanga'. Some aspects can be delineated. It is a practice of reciprocal resource management. Humans stimulate the intrinsic vitality (mauri) of life-forms, and receive in return abundant harvests: 'We are all descended from Papatuanuku; she is our kaitiaki and we in turn are hers'.[21] Tai Tokerau elders recall being taught

17. This encroachment into the last stands of North Island indigenous forest can be seen from the summit of the Coromandel (Te Paeroa) and Kaimai Ranges, for example from Castle Rock.
18. J White, *Ancient History*, Wellington, Government Printer, 1887–1891, folding plate no 1(d), 'Maori Mythology' in vol 1, 1887
19. Swainson, 1859, in H H Turton, *Epitome of Official Documents Relating to Native Affairs and Land Purchases of the North Island*, Appendix F, 'On the Tenure of Native Lands', p 23
20. John White, 1861, in Turton, p 50

when planting crops, to allocate the outside rows 'for the rats and the insects to have their share'.[22] Harvesting is sustainable: large captures of eels and lampreys are taken when the fish congregate to migrate, when many will escape predation. There is an order in which foods are harvested in succession, leaving life-forms unmolested for the remainder of the year: some hapu trap inanga not as whitebait, but as adults when they congregate in spawning migrations, when they are rich with roe.[23] When the resource needs respite from harvesting it is protected through rahui. The protection is placed and lifted according to circumstance. Protection is placed by an ariki, that is a person with descent from ancestors of sacred lineage and thereby inherently sacred, or by a tohunga, a person able to handle sacred forces. Sustaining the abundance of the natural world requires ariki and tohunga who have the power to propitiate the mauri of the forests and of the life forms: the Tohunga Suppression Act 1907 impacted on loss of knowledge, and loss of resources.

2.5 CLAIMANT CONTENTIONS

Maori interests in flora and fauna are realised or compromised through statutes and through resource management. New Zealand's participation in the International Convention on Biological Diversity, and the Department of Conservation's resource management policy were effected without Maori advice and participation. In 1840 each hapu exercised a resource management policy based on accumulated experience of local ecology. Present statutes do not allow hapu to exercise independent management, appropriate to local resources; the statutes pre-empt rangatiratanga.[24]

2.6 HAPU AUTONOMY

Records describe residential social groups engaged in constructing massive lamprey and eel weirs;[25] an entire village feasting on a harvest of lake-locked koaro;[26] two closely related hapu contesting their right to an eel weir;[27] canoe crews

21. M Roberts, et al, 'Kaitiakitanga: Maori Perspectives on Conservation', *Pacific Conservation Biology*, vol 2, 1995, p 13
22. However the reasons may be subtle. Economic entomologists advise planting shelter belts with species which will attract insects pests away from the main crop.
23. R M McDowall, *The New Zealand Whitebait Book*, Wellington, Reed, 1984, p 86
24. R Cooper, 'Maori Customary Use of Native Birds, Plants and Other Traditional Materials', report presented at the Annual Conference of the Australasian Wildlife Management Society, Christchurch, 1995. Concerns of the Wai 262 claimants include 1. the Crown's alliance with market economy interests and not with Maori interests in flora and fauna; 2. the Crown's exclusion of Maori practices and perspectives from resource management policy; and 3. the pre-emption of Maori property rights in flora and fauna.
25. T W Downes, 'Notes on Eels and Eel-weirs (Tuna And Pa-tuna)', in *Transactions and Proceedings of the New Zealand Institute*, vol 50, 1918, pp 296–316; H F Johnston, 'Report of the Royal Commission Appointed to Enquire into and Report On Claims Made By Certain Maoris in Respect of the Wanganui Rover', AJHR, 1950, G-2, pp 1–19

on Lake Taupo working cooperatively to net koaro.[28] There was concordance between the size of the harvest, and the size of the social group holding property rights in the technology of the harvest, and into the early twentieth century large harvests were sometimes still reaped.[29]

As colonisation proceeded, statutes legislated European concepts of individual property rights. Land sales and land confiscations were accompanied by loss of authority over resources. Urban migration was accompanied by loss of leadership on rural marae. Harvests dwindled as the forests were cleared and burned, so the social activity of harvesting became less frequent.

In 1996, intellectual property rights are vested in social groups which have formed in response to modern social life. For example, the National Body of Maori Traditional Healers views the country as divided into nine iwi, each of whom holds intellectual property rights over its own pharmocopoeia. The National Body is composed of representatives from the nine iwi, and speaks on behalf of all practitioners in matters relating to policy advice to Government.

The current importance of iwi may reflect a fragmentation of Maori authority and an effort by Maori to regroup in effective political bodies. Historical records strongly suggest that in 1840 hapu had greater autonomy.[30] Overall, control over the alienation of intellectual property rights may have been vested in an individual, or in whanau, hapu, and iwi. Practices differed from region to region, and altered with changing political circumstances.

In 1859 property rights in land were understood by the Attorney-General as follows:

> Land is held by them either by the whole tribe, or by some family of it, or sometimes by an individual member of a tribe. Over the uncultivated portions of a territory held by a tribe in common every individual member has the right of fishing and shooting.[31]

Tribal negotiations were concluded as a compromise between customary practice and innovation to meet the contingencies of the immediate circumstance, and they differed in each district. Gore Brown reported, 'We found that the Natives had no fixed rules applicable to all the tribes and to every locality, and we adopted

26. C A Whitney, 'Minnows and Inanga', in *New Zealand Fishing and Shooting Gazette*, vol 14, no 5, 1941, p 10
27. J Cowan, *Tales of the Maori Bush*, Dunedin, Reed, 1934, pp 256–261
28. E Best, *Fishing Methods and Devices of the Maori*, Wellington, Government Printer, 1929, p 205, fig 80
29. In 1947 the Perano family caught 250 kilogram of whitebait in seven hours on the Wairau River, Blenheim. McDowall, *The Whitebait Book*, p 123.
30. In 1883 H H Turton collected 15 documents written between 1843 and 1861 which describe codes of transfer of property rights, most written expressly for the information of the Crown. In the following discussion, it should be noted that nineteenth century commentators use the word 'tribe' for a land-holding group that was frequently a hapu: 'in the Tainui District, on the Wairoa River, there has been located for a long time a little tribe called Ngatitai . . . this little hapu is related by marriage to the Ngatipaoa, Te Akitai, and Ngatimaru, which are adjoining hapus and *iwi* . . . in reference to the tribe which now reside at Orakei, called the Ngatiwhatua (which is a hapu of the great Kaipara Tribe, the Roroa), this hapu does not admit any tribal right to be exercised over it'. John White, 1861, in Turton, p 58.
31. Swainson, 1859, in Turton, p 23

as our guide in each district the customs that were in force among the people themselves'.[32] Edward Shortland noted that 'each of the grand divisions into which the Natives of the Northern Island may be divided has its own characteristic dialect',[33] while an anonymous comment was, 'there was no tribunal, external or common to all the tribes, to which appeal could be made'.[34] Reverend Hamlin confirmed 'Each party or tribe seems to have been guided by existing circumstances in the management of their affairs',[35] and McLean was insistant that tribal convention 'varies so much in different parts of the country, I should wish to know what part of the country you refer to.'[36] In 1854, A S Thomson found that different medicinal remedies were used in different areas, and concluded there was no national pharmacopoeia.[37]

2.7 THE ORIGINAL POSSESSORS OF THE LAND

Territory claimed by conquest frequently changed hands, yet in 1840 the North Island tribes recognised enduring historical divisions of the landscape; any change in tribal boundaries dispossessed people of their ancestral burial grounds, their placenames, their history – the keys to their songs, poetry, and oratory:[38]

> At what time the boundaries of the districts of the respective chiefs of the Island were defined as we now find them, it is impossible to ascertain . . . The Ngapuhi, notwithstanding their extensive conquests, obtained within the last twenty-five years, still confine themselves to their ancient territorial rights, and the Ngatiwhatua, although ofttimes defeated and almost annihilated, still assert their claim to the territorial possessions of their ancestors.
>
> . . . . .
>
> Several sales of land about the Kaipara belonging to the Ngatiwhatua were effected during the time [that Ngapuhi chiefs were sheltering Ngati Whatua who had been defeated by Hongi] but reference was always made to those who had placed themselves under protection, and their title as the original owners of the soil invariably acknowledged . . . Again, in gratitude for services performed, a piece of land might be presented . . . In the event of such cultivation being abandoned it would revert to the person who had granted it . . . Possession of land, even for a number of years, does not give a right to alienate such property . . . without consent of the original donor of the land; but it may be continued in the possession of the descendants of the grantee to the latest generation.[39]

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32. T Gore Browne, 1860, in Turton, p 46
33. Edward Shortland, 1843, in Turton, p 1
34. Anonymous, 1860, in Turton, p 11
35. Reverend F Hamlin, not dated, in Turton, p 20
36. Donald McLean, 1860, in Turton, p 17
37. L K Gluckman, *Tangiwai, a Medical History of Nineteenth Century New Zealand/Medical History of New Zealand Prior to 1860*, Auckland, L K Gluckman, 1974, p 157
38. When the Tongan 'eiki Ma'atu Ngongo defeated the local chiefs of Niuatoputapu Island around 1830, he secured his new territory by punishing with death any discussion of the land's former history (G A Rogers, 'Kai and Kava in Niuatoputapu', PhD thesis, University of Auckland, 1975).

According to Edward Shortland:

> A chief when speaking of the title by which he holds his lands, never fails to make a distinction between those which he has inherited from his ancestors and those which he or his ancestors have obtained by conquest . . . The claim which he advances [for land claimed by conquest is] that they are the *utu*, or compensation for the death of his relatives who perished in the fight.[40]

John White, however, in 1861 described how Ngati Whatua ki Orakei do not conform:

> Again, in reference to the tribe which now reside at Orakei, called the Ngatiwhatua (which is a hapu of the great Kaipara Tribe, the Roroa), this hapu does not admit any tribal right to be exercised over it by the Waikato, Tainui, or Ngatipaoa Tribes. This hapu took possession of this district by force of arms from the Tainui and Ngatipaoa Tribes. All the fishing-grounds on the Waitemata River belong to them, and none of the surrounding tribes would attempt to fish on them unless permission were granted by the Ngatiwhatua; nor do they pay any tribute of fish or other thing to the original owners of the district . . .[41]

Aperahama Taonui described a Ngati Whatua practice of making an offering to Hine Kui, the original possessor of the land, who manifests in the hump-backed tiger beetle grub (*Neocicindela tuberculata*): 'that grass is sacred because it is food which is taken [to Hine Kui]. That is the true chief of the land'.[42] In the 1980s, children of Tai Tokerau still 'fished' for Hine Kui by poking grass straws down the burrows of tiger beetle grubs.

As a hapu buried its members in its whenua, the land became filled with spiritual forces controlled by that hapu, beneficial to itself, and dangerous to others. The loss to a hapu of not being granted the boundaries it had designated can be read in a record left by the commissioner for determining titles to land in 1846:

> in the case of Native reserves great difficulty has been found in getting Natives belonging to one family to go on a reserve made within the boundary of the land belonging to another family, although it has been fully explained to them that the reserves were made for the benefit of the Natives generally, and not for any particular tribe or family . . . in several instance that have fallen under my notice they have positively refused to cultivate a Native reserve so situated, although at the time in actual want of a spot to grow their potatoes upon.[43]

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39. George Clarke, 1843, in Turton, pp 3, 4, 5
40. Edward Shortland, 1843, in Turton, p 1
41. John White, 1861, in Turton, p 58
42. D R Simmons, *The Great New Zealand Myth*, Wellington, Reed, 1976, p 29
43. Mr Spain, describing the Port Nicholson District, in Turton, pp 18–19. Polynesian people widely desire to live on the land where their ancestors, the original possessors, are buried. 'My four main ancestors are resting here in Niuafo'ou and they are not transferable. My family lands are here and they are not transferable. This is my island and here I intend to stay' (Ongoloka, 1967, in G A Rogers, *The Fire Has Jumped*, Fiji, University of the South Pacific, 1986, p 127).

Thus, a number of records suggest that when whenua (land with its flora and fauna) was transferred, the original possessors were acknowledged to have a continuing influence in its well-being (mauri). Contemporary claims by Maori that as the original possessors of the land, they are the kaitiaki of the whenua, its flora and fauna, are consonant with these records.

2.8 BOUNDARIES

John White, interpreter in the Native Office, in 1859 commented: 'There is not an inch of land in the Islands which is not claimed, nor a hill nor valley, stream nor forest, which has not a name'.[44] However, Edward Shortland, Protector of Aborigines, noted in 1844 that some tracts of forest were left unclaimed: 'there are large districts on the borders of different tribes which remain uncultivated. These *kainga tautohe* (debatable lands) are a never-failing cause of war till one party has lost its principal men'.[45]

Many boundaries were demarcated by claims to floral and faunal resources:

> Most of the tribal boundaries lay along the highest ridges; and, as these were the resort of the rat, every chief became acquainted with the exact boundaries of his land [through setting pit-fall traps]. Where a creek was the dividing boundary this was occupied with eel-dams, not made of wickerwork that might be carried away by a flood, but of such construction that generations might pass and each put the eel-baskets down by the carved and red-ochred post which its ancestors had placed there. Where the dividing boundary between two tribes ran along a valley, landmarks were erected, generally of cairns, to which names were given.[46]
>
> I will allude to the mode in which a tribe asserts and maintains its rights over a large district. It was a custom to go at certain times to the utmost limit of the land claimed, and partially clear and cultivate a portion here and there. This was called *uruuruwhenua*.[47]

Ecologists have observed that the location of some pa suggests they were positioned to guard valuable resources.[48]

Titles to land were given to specific food-producing resources, rather than to just the land itself,[49] and each member of a hapu held defined resource rights:

> Because resources were so closely defined, a man usually held a number of different titles: one might be for a village space . . . another for a plot in a plantation, another for a specific tree in common land for bird snaring . . . The same tree could be subject to several different titles: one for fowling and another for the edible roots of

44. Turton, p 25
45. Shortland, in Turton, p 24
46. John White, 1859, in Turton, p 25
47. John White, 1861, in Turton, p 52
48. Park, p
49. I H Kawharu, *Maori Land Tenure*, Oxford University Press, 1977, p 59

> the fern growing around it. Or if the tree bore a big crop of berries, attracting a lot of birds, it might carry a number of snares.[50]

In the South Island, 'Bird preserves were kept in families and trespassing was a grievous offence. Boundaries were called wakawaka and preserves rauiri, as were also eel reserves in the rivers'.[51]

Rights in an eel-weir, a pit-fall trap, a miro tree, or a watering-place of pigeons, were transferred by genealogical succession: 'With the exception of . . . cases of forfeiture they descend from father to son in regular succession.'[52] Edwin Stanley Brookes, Government Surveyor, reported in the 1880s that along the Awakino River bank (Taranaki), the daughter of Te Wetere had sole right to the 'farming' of kiekie fruit.[53] Tai Tokerau who worked in the Ahipara gumfields during the 1930s recalled that harvesting forest resources sustained their livelihood. They would tie up the ripening kiekie heads (tawhara heads) to prevent the rats from eating them; each person knew their own ties and did not take a head tied by someone else.

During the hearing of the Muriwhenua claim in 1985, fishermen gave evidence of their rights in named fishing grounds, and the succession of fish they caught there. Much of this evidence was given in confidence. Hapu contend with each other for resources and prestige, and because rights can be usurped, the locations of resources are often kept secret. Ngati Hine had extensive kumara gardens along the Waiomio River banks, visible to the public, but they also planted smaller plots of early maturing kumara and special varieties in a warm, sheltered location which was kept secret.[54] In another instance, small preserves of banded kokopu near a pa were kept secret from Pakeha.[55] In 1988 a Ngati Whatua woman was criticised by members of her marae because she would not teach a weaving technique she alone has knowledge of.[56] She had a conventional right to guard a skill which was an exclusive prerogative of her lineage.

Land sales destroyed long-established hapu boundaries. Further actions by the Crown deprived hapu of their economic and social interests in flora and fauna resources:

> Hapu lost treasured resources through the Crown denying their choice of boundaries when creating reserves. In 1852 hapu of Ngati Maniapoto negotiated with the Crown's land purchase agent, George Cooper, to sell a block along the banks of the Manauira stream, notifying the sites they desired to retain; these included Te Kauri, the kainga of the chief Ngataua (Takerei); the mission station at Te Mahoe; and a stand of ancient kahikatea trees at Tauwhare which had become sacred. Cooper

50. Kawharu, pp 60–61
51. Beattie, p 136. The New Zealand Wildlife Service won world renown for its recovery of the Chathams black robin, but Tikao noted wryly that nowhere were there boundaries for woodhens and ordinary bush birds.
52. George Clarke, 1843, in Turton, p 3
53. E S Brookes, *Frontier Life: Taranaki, New Zealand*, Auckland, Brett, 1892, p 179. The fruit is tawhara, *Freycinetia banksii*.
54. Personal observation, 1988
55. W J Phillipps, *The Fishes of New Zealand*, New Plymouth, Avery, 1940
56. Personal observation, 1988

> reported that the areas reserved by the hapu included '300 acres of the best cultivable land in the block'. The Colonial Secretary, Alfred Domett, instructed Cooper not to make any purchase until Ngati Pehi agreed 'to dispose of the extent of the country required by the Government'. Ngati Pehi desired the settlement of Europeans at Mokau, and the Crown held exclusive right of purchase. The deed of sale negotiated at Mokau in 1854 between Ngati Pehi and the Chief Land Purchase Commissioner, Donald McLean, states: 'There is no reserve whatever in this land now entirely given up by us . . .'.[57]

Productive reserves became weakened by fragmentation, die-back,[58] illegal timber cutting and grazing, invasion by stock and acclimatised species, and so on, when the Crown pepper-potted Maori reserves amongst allocations made to Pakeha settlers for agricultural clearance.[59]

Knowledge of the limits to title was the responsibility of elders and priests, and youths of senior families were usually given thorough instruction in boundary lore;[60] the Tohunga Suppression Act 1907 contributed to loss of knowledge of flora and fauna resources.

2.9 COMMISSION: IN PARTICULAR, WHO CONTROLLED THE TRANSFER OR ALIENATION OF RIGHTS TO FLORA AND FAUNA

Some nineteenth-century commentators described alienation of rights as an issue of sovereignty. 'Attributes of sovereignty' included administration of justice, the right of declaring war, the power of temporary alienation of land belonging to the tribe, and were 'all vested in the tribe generally, and although often exercised by chiefs or *tohungas*, were so exercised with the consent, either express or tacit, of the whole tribe'.[61] Thus, each landholding group acted as a consultative body with respect to justice, war, alienation of land and resources, and projects requiring joint labour. Along with:

> the right of the tribe to require service from all its members, the necessity of keeping up their own numbers, and of preventing strangers from acquiring landed property to be used to the injury of the tribe . . . rights of ownership, whether in one or many joint proprietors, were not alienable without the consent of the tribe.[62]

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57. Park, 1995, pp 132–137, citing Mokau District Land Survey records, box file, item no 12
58. When a stand of native forest is fragmented, species which grow in the heart of the forest become exposed along the new boundaries, where they are no longer protected by the species which thrive on forest edges. Inroads of wind and stock further debilitate the forest biota.
59. M K Watson and B R Patterson, *'The White Man's Right: Acquisition of Maori Land by the Crown in Wellington Provincial District of New Zealand, 1840–1876*, Wellington, Victoria University, Department of Geography, Working Paper No 3, 1985, p 523
60. Kawharu, p 60
61. Anonymous, 1860, in Turton, p 11
62. Bishop of New Zealand, 1860, in Turton, pp 17,18

George Clarke, Chief Protector of Aborigines, in 1843 concluded that principles determining rights in land applied to almost all other property: 'This common right and title to property is not confined exclusively to land, but embraces almost every other description of property. A canoe generally belongs to a family, and sometimes to a hapu, in consequence of each individual assisting in its formation or advancing a portion of his property for its payment. A cow or horse may have twenty claimants'.[63] Clarke in 1843 described how alienation of property rights was controlled by the hapu:

> The families have in common with the chiefs, the right of keeping pigs, gathering flax, shooting or snaring pigeons, catching rats, ducks, kiwi, digging fern-root, etc., or of gathering the natural productions of the woods and open country for the purpose of food, etc.; every individual of the tribe having and exercising these privileges in common, but still acknowledging the rights of some family or individual member of a family to dispose of such property – that is, as president, head of the family, or chief of the tribe or hapu, to make the first proposal for such alienation – yet they would not consider the purchase valid without the consent of the majority of the principal men of the tribe, and of the payment for the same every individual would expect to receive his appropriate share.[64]

In 1856 a board of inquiry examined evidence dating back to 1822, and confirmed the autonomy of land-holding groups:

> Each Native has a right, in common with the whole tribe, over the disposal of the land of the tribe, and has an individual right to such portions as he or his parents may have regularly used for cultivations, for dwellings, for gathering edible berries, for snaring birds and rats, or as pig runs . . . Generally there is no such thing as an individual claim, clear and independent of the tribal right. The chiefs exercise an influence in the disposal of the land, but have only an individual claim like the rest of the people to particular portions.[65]

Within the territory of a hapu, members of other tribes often had claims:

> it frequently happened that one tribe gave land within their own limits to the members of another tribe for assistance rendered in times of danger, which gifts were held most sacred . . . claims to land were made by one tribe and admitted by another as compensation for the murder of a chief thereon, or another injury . . . an accidental death of a chief on the land of another tribe gave his family a claim to it[66] . . . a tribe will give a spot of land to another, either as a marriage portion or to induce them to reside, etc. The former are still *take* ['root', the original possessors of the land], but the latter may, if they like, sell; only they generally hand over the payment to the former, reserving to themselves the honour attendant on the transfer.[67]

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63. George Clarke, 1843, in Turton, p 3
64. George Clarke, 1843, in Turton, p 3
65. Turton, p 19. Best expressed reservations about Maori holding land in common, but did not give examples that would challenge the generalisation (Elsdon Best, *The Maori*, Wellington, Board of Maori Ethnological Research, 1924, p 394).
66. Board of Inquiry, 1856, in Turton, p 19

In many districts a chief could not alienate a tract or a resource claimed by another member of the hapu:

> The . . . chief, Hongi, was urged to give up a small piece of cultivated ground to a Mr. Stack . . . but, though he wished much to oblige his friends the missionaries, and was . . . by far the most influential chief of the northern portion of the Island, he distinctly stated that he could not do it: if the missionaries wanted the land they must treat with the people who cultivated it, to whom alone it belonged.[68]

An ariki did not have 'any beneficial rights or any power of disposal or control over the property in the land without, or contrary to, the assent, expressed or implied, of the body of the tribe. The customs about this . . . were by no means uniformly the same in all tribes'.[69] However, Reverend Hamlin understood that the person from whom a land-holding group traced its descent, could sell the tract: 'this person can sell if he likes without the consent of his party; the party selling without his consent would be a *hoko tahae*.'[70] Archdeacon Hadfield understood that while a chief could not alienate 'any land which has become vested in the tribe by long possession' he could 'deal with lands obtained by conquest'.[71]

Edward Shortland, Protector of Aborigines, in 1844 commented on the settlement of disputes:

> When a dispute arises between members of the same tribe as to who is the rightful owner of a piece of land, the principal persons on both sides meet together to discuss the affair: their pedigrees are traced, and the ancestor from whom either party claims is declared; and proof that any act of ownership (such as cultivating, building a house, setting pit-falls for rats, or making eel-weirs) was once exercised without opposition by one of their ancestors, is considered sufficient evidence of the right of his descendants to the land.[72]

Hapu at times invaded each other's resources. In 1847, A S Thomson observed counter-claims to tracts of fern-root:

> The Waipa County is noted for its fine fern root (aruhe), which is generally found in rich alluvial soil on the banks of rivers, or in deep valleys. Some of the choicest spots are made tapu to ensure a supply, and fierce quarrels have happened between different tribes from the spots having been set on fire.[73]

Lineages contest resources in many Polynesian societies. A group whose claim rested on historical precedence might lose out to a group who demonstrated brilliance of oratory, or political force, or cunning manipulation; a feat of surpassing skill confirms the favour of the gods. Edwin Stanley Brookes,

67. Archdeacon Maunsell, 1840, in Turton, p 19
68. George Clarke, 1843, in Turton, p 5
69. Anonymous, 1860, in Turton, p 12
70. Reverend J Hamlin, not dated, in Turton, p 20
71. Archdeacon Hadfield, 1860, in Turton, p 23
72. Turton, pp 24–25
73. Christine Mcdonald, *Medicines of the Maori*, Collins, Auckland, 1973, p 108

Government surveyor in Taranaki during the 1880s, noted that 'any marked skill would be fully appreciated'.[74] Reverend Benjamin Yate Ashwell witnessed a challenge between two hapu contesting rights to the eel harvest at Lake Whangape, on the Waikato River near Maunga Taupiri. Lake outlets are points of congregation for migrating fish, and this is where the contested weir was sited. Ngati Pou led by the chief Uira had the strongest claim to the harvest, but were challenged by their kin, the related hapu Ngati Mahuta led by the chief Kepa, brother of Te Wherowhero (Potatau). Both sides were armed with muskets, tomahawks, and stone clubs, and war challenges were issued. Then a Ngati Pou warrior broke out into the verse of a psalm. A Ngati Mahuta warrior answered him with the second verse; each side responded with successive verses, and a peaceful resolution was agreed to.[75]

Political relationships were encoded in presentations by hapu of the resources they conventionally controlled. During the nineteenth century, the Banks Peninsula chiefs sent an annual presentation of marine products to Kaiapoi. Kaiapoi contended that the Banks Peninsula chiefs were in a state of vassalage to their chief, Maiharanui (the upoko-ariki of Ngai Tahu at Kaiapoi), and received the presentation as tamatama, that is as tribute. Kaiapoi then sent back a presentation of kauru,[76] saying it was done as a gesture of courtesy. Tikao, however, a chief of Banks Peninsula, contended that the return presentation of kauru signified an exchange between equals.[77]

2.9.1 Summary

Writers in the period 1843 to 1861 commented on 'how very tenaciously [Maori] maintain their customs and usages on all subjects connected with their lands'.[78] Land-holding groups had a strong sense of property rights over the resources of their rohe. Transfer of rights to flora and fauna within the hapu was by genealogical succession or by exchange; where the rights were alienated outside the hapu, the hapu controlled the transfer. Contemporary iwi claims for the return of rangatiratanga to the land-holding group in respect to resource management are supported by these records.

Individual rights were established by accepted conventions: the first discovery of a tree, the shooting of a pigeon, constructing an eel-weir, digging fern root, making a path, the accidental loss of a friend at a place, receiving a wound there, recovering from sickness there, and so on.[79] Maori claims to intellectual and material property

74. Brookes, p 178
75. Cowan, pp 256–261
76. Kauru is a preserved food, produced by steaming the stems of young cabbage trees (*Cordyline* spp) in an umu ti. P Simpson, 'Relating Ecological and Human Values in the Cabbage Tree, Ti Kouka', *New Zealand Studies*, v 1, 1997, in press.
77. Beattie, pp 140–141
78. George Clarke, 1843, in Turton, p 5
79. George Clarke, 1843, in Turton, p 4

rights in indigenous flora and fauna are consonant with these conventions; Maori are the original possessors and users of the resource.

2.10 COMMISSION: IN PARTICULAR, WHETHER THE INTERESTS WERE HELD BY THE GROUPS AND INDIVIDUALS WHO POSSESSED THE RIGHTS TO THE LAND ON WHICH THE FLORA AND FAUNA WERE LOCATED

As noted, Attorney-General Swainson described in 1859 how interests in flora and fauna are synonymous with land-holding, where the group is a tribe or hapu, and the individual land-holder a member of a hapu:

> Their territorial claims are not confined to the land they may have brought into cultivation . . . Forests in the wildest part of the country have their claimants. Land apparently waste is highly valued by them. Forests are preserved for birds, swamps and streams for eel-weirs and fisheries . . . Land is held by them either by the whole tribe, or by some family of it, or sometimes by an individual member of a tribe. Over the uncultivated portions of territory held by a tribe in common every individual member has the right of fishing and shooting. When any member of a tribe cultivates a portion of the common waste he acquires an individual right to what he has subdued by his labour; and in case of sale he is recognised by the tribe as the sole proprietor. If undisposed by sale it generally descends from father to son.[80]

However, White in 1861 described specific instances where one group of people held interests in flora or fauna, while another group retained possession of the land:

> There are . . . lands which are ceded to a tribe for a specific purpose with certain restrictions, and the tenure of such lands depends on the conditions being fulfilled . . . sometimes only the right of fishing or hunting was granted, and, in order that the owners of the district might keep the mana or right to the land, the tribe who had received permission to fish or hunt had to render the proceeds of their first day's sport to the owners of the land. Nor was the time for this acknowledgement optional with the giver; for on the morning of the day after the first fishing or hunting excursion certain men of the tribe were obliged to take the fish or game to the owners of the land, and the rest of the tribe were not to fish or hunt again until the present so sent was acknowledged by the return of the messenger. There are lands held on these conditions to this day.
> . . . Sometimes, also, a permission was given to cultivate in consideration of a few of the best kumaras or taros being sent immediately on the crops being gathered. Lands have been used in this way by father and son for many generations.
> . . . As a general law it was not allowed to bury the dead of the occupying tribe on land held by such tenure.[81]

80. Swainson, 1859, in Turton, p 23
81. John White, 1861, in Turton, p 55. White advised, 'it must be borne in mind that I have spoken of the Maoris of the past'.

White did not record the intense interest and pleasure of the participants in these arrangements, nor the sacredness inherent in the presentation of first fruits to the possessors of the land; but he did describe a festival that finalised the fulfilment of a contract:

> if a chief is drowned, his surviving relatives demand from the owners of that part of the river or coast where his body may be found that for a certain period no fish or shell-fish shall be collected from it. This proceeding is called a *rahui*, and continues until the next shark-fishing season. The owners of the shark-fisheries then collect all the sharks taken at that season and dry them, when the tribe of the drowned chief are sent for and entertained with a feast at which the sharks are given to them. By this act the *rahui* is taken off, and the fish or shell-fish can thereupon be again taken from any part of the river or coast. Should the *rahui* be broken by the resident tribes, the relatives of the drowned chief then claim an equal right to the land.[82]

Where an outside group held interests, they suffered a loss when the land was sold. The interest of these outsiders was sometimes recognised:

> A chieftainess, who was taken slave from the South by the Ngapuhi and other northern tribes, became the wife of a Ngapuhi chief; her claim stood in the way of completing a sale of the land, and it was not until the consent of her son by the Ngapuhi chief was gained that the land could be disposed of by the Natives residing on it; and to him, in the due course of time, a portion of the payment was transmitted. . . . a chief, who had lost his canoe by drifting to sea, went along the coast to the settlement of a tribe who had been at variance with his tribe for many years, and found his canoe there, but was murdered by them. His tribe collected a war party, proceeded to the settlement, and brought away the body of the deceased chief, and in the following year went and cultivated the land. The block whereof this cultivation formed part was afterwards sold by the original owners, and the relatives of the murdered chief received payment for the portion they had cultivated.[83]

2.10.1 Summary

There are Pacific societies where it is also customary practice for possessors of the land to grant rights to the harvesting of the land's produce to another group.[84] In the New Zealand records cited, the group receiving these rights was bound by sacred protocol to return a presentation of produce. The fulfilment of the contract was marked by a festival.

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82. John White, 1861, in Turton, pp 53–54
83. John White, 1861, in Turton, p 53
84. Descriptions by Pacific researchers confirm that the practice of separating ownership from use rights is well established in Polynesian land tenure. Residents of Falehau village on Niuatoputapu Island (Tonga) each year create communal yam gardens on the best land available; the landowner receives a share of the first harvest of the crop; the presentation is an occasion of feasting and festival when allocations are also made to the 'eiki and church ministers (G A Rogers, 'Kai and Kava in Niuatoputapu', PhD thesis, University of Auckland, 1975).

2.11 COMMISSION: IN PARTICULAR, WHETHER OR NOT THE CROWN REGARDED RIGHTS TO TREES (TIMBER) AND OTHER FLORA AND FAUNA AS TRANSFERRING WITH THE LAND WHEN TITLE TO THE LAND WAS TRANSFERRED

Under New Zealand Statutes a block of land was freeholded as the entire area contained within a fixed boundary. From 1867 on, the Animals Protection Acts and the Fish Protection Acts (initially the Propagation of Salmon and Trout Act 1867) enforced Pakeha concepts of private possession of the land and its forests, fisheries, and wildlife. An individual property owner was granted rights to all fauna within the boundaries, and the right to prohibit any person or animal from entering the property or crossing the land. Land-holders could appeal to the Minister for the eradication of protected flora and fauna within their boundaries when it impinged on economic interests.

The Fisheries Conservation Act 1884 stated: '3. Nothing contained in this Act shall apply to . . . (2.) Any person taking fish in water of which he is the owner . . .'. Section 14 of the Animals Protection and Game Act 1921–22 stated:

> (1.) No person shall take or kill any imported game or native game during an open season in any district unless he is the holder of a license under this Act to take or kill imported game or native game in such district during that season . . .
>
> . . . . .
>
> (3.) Notwithstanding any thing in the foregoing provisions of this section, any person in *bona fide* occupation of any land, and any one son or daughter of such person, may during an open season take or kill on that land without a license . . .

Section 32 says:

> The Minister, on being satisfied that injury or damage to any land has arisen or is likely to arise through the presence on such land of any animal, whether such animal is absolutely protected under this Act or is imported game or native game, and whether or not such land is a sanctuary, may in writing authorise the owner or occupier of such land, or the acclimatisation society of the district, to take or kill, or cause to be taken or killed, such animals thereon . . .

Section 34 goes on to say:

> (1.) Every person in pursuit or in possession of imported game or native game shall produce his license to any authorised person . . .
>
> (2.) For the purposes of this section 'authorised person' includes . . . the owner or occupier of the land on which any person may be found in possession or in pursuit of imported game or native game, and all holders of licenses to kill any such game issued under this Act . . .

Section 38 then says:

> 38. Every person commits an offence, and is liable to a fine of five pounds, who commits any trespass by entering or being on private land in search or pursuit of imported game or native game . . .

And section 39 reads:

> 39. . . . nothing in any license or other authority under this Act shall entitle the holder thereof to enter upon any private land without the consent of the owner or occupier thereof, or upon any State forest or provisional State forest.

From 1840 to 1861 settlers were unrestricted by statute with regard to introductions of foreign flora and fauna (stock, game, garden plants, and so on). From 1861 to 1990 the Crown developed statutes designed to protect the assets of acclimatisation societies and fish and game councils.[85] These regulations were intended to ensure that 'rights to exploit the resource were to be available to and controlled by the individuals or organisations responsible for their release' and that 'the costs of ongoing management and maintenance were to be recovered'.[86]

From 1861 Crown statutes set a precedent for property rights in flora and fauna, and for the property owners of wildlife to sell hunting licences. The Animals Protection Act 1907 stated that 'the property in all animals and birds in the possession . . . of any registered acclimatisation society shall be deemed to be absolutely vested in such society' and 'in any district administered by the Department of Tourist and Health Resorts the property in all animals and birds . . . shall be deemed to be vested in the Minister' (section 55). Thus species of fish released by the acclimatisation societies into New Zealand streams were 'in the possession' of the societies.

Under the Animals Protection and Game Act 1921, acclimatisation societies were again accorded property rights in the fauna they had introduced: 'For the purposes of this Act the property in all animals in the possession or under the control of any registered acclimatisation society shall be deemed to be absolutely vested in such society . . . Provided that in any district administered by the Department of Tourist and Health Resorts the property in all animals in the possession of or under the control of the said Department in that district shall be deemed to be vested in the Minister . . .' (Part 4, section 28). In 1970 the Wildlife Service, Department of Internal Affairs, prosecuted Taupo hapu for harvesting smelt in Lake Taupo. The court ruled that the interests of the acclimatisation societies prevailed, as they had introduced the smelt into the lake.[87]

No statutes have granted property rights in flora and fauna to Maori per se. With the introduction of game licences in the 1860s, and with the scheduling of species from 1907, management of indigenous flora and fauna was transferred to the

85. Colonial Animals Protection Act 1861; Animals Protection Acts 1867–1908; Animals Protection and Game Act 1921–1922; Wildlife Act 1953; Conservation Law Reform Act 1990.

86. R M McDowall, *Gamekeepers for the Nation*, Christchurch, Canterbury University Press, 1994, p 54

87. P J Burstall, 'The Introduction of Freshwater Fish into Rotorua Lakes' in D Stafford, R Steele, and J Boyd (eds), *Rotorua 1880–1980*, Rotorua, Rotorua and District Historical Society, 1980

Crown. The seasons imposed did not correspond with Maori practices of successional harvesting. Section 3(1) of the Animals Protection Act 1907, stated:

> The season for taking and killing native and imported game (except deer and godwits) throughout New Zealand shall begin at six o'clock in the morning of the first day of May and close at seven o'clock in the eveing of the thirty-first day of July in each year . . .

Section 26 says:

> The year one thousand nine hundred and ten and every third year thereafter shall be a closed season for imported game (other than deer) and native game: Provided that the Governor may, on the recommendation of the Minister, by notification exclude the Urewera country and other Native districts in New Zealand from the operation of this section so far as the same relates to native game . . .

And section 27 reads:

> Until otherwise provided by regulations made under this Act, it shall be lawful to kill or take the godwit – known by the native name kuaka or hakakao – during the months of February, March, and April; but no person shall kill or take any such bird at any other time.

Maori practices of tenure are based on a different ethos, which recognises the hereditary rights of individuals and groups to particular resources, and accords control over the alienation of property and resources to kin and tribal groups. Turton's collection of documents written between 1843 and 1861 had informed the Crown of principles of Maori land tenure. The Protection Acts, dating from 1867, did not accommodate Maori concepts of property rights. The legislation went against advice given by Governor Gore Browne in 1860:

> I can only, therefore, in conclusion, express my conviction that the proper course for Her Majesty's government to pursue in the future is that which has been steadily followed in the past – namely, to continue to deal with the chiefs or the proprietors of the soil according to the custom existing among the Natives themselves in each particular district in which cession of territory may be in contemplation, and in the manner which best accords with the rights of property actually in force among them.[88]

C W Richmond, member of Parliament, had justified the Crown's decision to over-ride Maori codes of land and resource rights in 1858: 'The subject has two aspects: the one relating to the civilization of the Natives, the other to the promotion of the settlement of the country by Europeans'.[89]

88. T Gore Browne, 1860, in Turton, p 46
89. C W Richmond, 1858, in Turton, pp 7, 8

2.11.1 Summary

From 1867 the Crown's position was:

(a) Property rights to indigenous fauna transferred with the land.
(b) Property rights in introduced fauna released into the wild remained with the original owners where the owners were acclimatisation societies.
(c) Resource management was vested in the Crown.

That is, various indigenous species scheduled in the statutes as 'absolutely protected', 'native game', and 'imported game', were subject to restrictions imposed by statute and rescinded on the recommendation of the Minister. Indigenous fauna scheduled as game (godwit, wild duck, native pigeon, and so on) were subject to hunting licences and closed seasons. Indigenous fauna not scheduled (harrier hawk, black shag, longfin eel, shortfin eel, and so on) were subject to extermination campaigns in the interests of introduced species. The statutes pre-empted the rangatiratanga of hapu over the floral and faunal resources of their whenua. (The statutes through which the Crown assumed control of indigenous flora and fauna are chronicled in chapter 5.)

2.12 COMMISSION: IN PARTICULAR, WHO CONTROLLED KNOWLEDGE ABOUT FLORA AND FAUNA SUCH AS THE MEDICINAL PROPERTIES OF VARIOUS PLANTS

Tohunga were learned and expert in Rongoa Maori. During the debate on the Tohunga Suppression Act in 1907, Wilford read to the House an extract from Edward Shortland: 'The *matakite* and tohunga must both be members of the same hapu or subdivision of the tribe to which the sick man belongs, every hapu containing at least one *matakite* and several tohungas.'[90]

Several factors combine to suggest that at 1840 medicinal materials would have been gathered from within a hapu's own whenua. The harvesting of medicinal materials may be subject to rotation and other carefully controlled practices instigated by the kuia and kaumatua. Karakia uttered during the collection of medicinal materials are directed to the ancestors who guard the land, and in sickness it is one's own ancestors who are appealed to.[91] In 1854, A S Thomson reported there was no national pharmacopoeia;[92] New Zealand is a landscape of local diversity, and contemporary practitioners confirm that while they share an understanding of the principles of rongoa, they do devise a pharmocopoeia from their local resources.[93]

In the 1980s, amongst rural Tai Tokerau in Northland, kuia with knowledge of rongoa treated members of their whanau.[94] However, the great repositories of

90. NZPD, 29 July 1907, pp 516–517, citing Edward Shortland, *Traditions and Superstitions of the New Zealanders*, London, Longman, Brown, Green, Longmans & Roberts, p 127
91. University of Waikato, Rongoa Maori workshop, Waitaia Lodge, 1996
92. Gluckman, p 157
93. University of Waikato, Rongoa Maori workshop, Waitaia Lodge, 1996

knowledge of Rongoa are the tohunga. Healing practices are passed down lines of teacher-practitioners, so that each tohunga practices and develops a particular inherited tradition. These knowledge-traditions are not neccessarily lines of direct genealogical descent, but tohunga are usually politically aligned with their hapu and iwi.

Nga Ringa Whakahaere o Te Iwi Maori, The National Body for Maori Traditional Healing, states:

> Maori traditional healers are the guardians and gatekeepers of the intellectual properties of Maori traditional healing pertaining to rongoa rakau (medicial plants), rakau rongoa (medicines derived from these plants), and tikanga rongoa (the customs and practices associated with healing in these traditional terms). The control of all these taonga is inherently with each iwi whose voices are heard through the national body, Nga Ringa Whakahaere o Te Iwi Maori.[95]

Maori social organisation is resilient and traditional healers have met contemporary circumstances:

> We readily acknowledge that we are all 'kaitiaki' but individually we are ignored whereas, collectively, under the National Body, we can speak as one, yet the mana and the mauri still remains with each iwi and hapu.[96]

2.13 CONCLUSION

Maori have regrouped to meet the challenges of international legislation and retrieve what is appropriately valued from the circumstances of 1840. In determining property rights on the basis of nineteenth century records, a distinction should possibly be made between actions that met the circumstances of the day, and the prevailing ethos of a social group. People engaged in fighting campaigns, lamented the neglect of their cultivations:

> E tangi ana ki tona whenua
> Ka tipuria nei e te maheuheu.[97]

94. Pond, papers, 1988
95. Chairman (A Clark), Nga Ringa Whakahaere O Te Iwi Maori, personal communication, 1996
96. Apera Clark, personal communication, 1996
97. 'He matakite mo te pou o urutake', in A T Ngata, *Nga Moteatea*, Wellington, The Polynesian Society, 1959, Part l, p 70

CHAPTER 3

NGAHERE – THE FOREST ECONOMY

3.1 The Lowland Swamp – Forests

Before colonial settlement, agriculture had played a small part in Maori economy compared with the harvests from forests and fisheries. Maori settlements and cultivated gardens were concentrated at river mouths, estuaries, and lagoons – these are locations ecologically diverse and rich in wildlife resources.[1] In response to New Zealand's ecological diversity, each hapu had developed a local economy. On the vast strands and mudflat harbours of Muriwhenua, Ngati Kuri were skilled in the technology of trapping migratory kuaka (godwit). In the South Island, Tikao thought, 'rats and woodhens were more hunted . . . and the tui, pigeon and kaka in the North Island.'[2]

Park has proposed that swamp-forests occupying lowland plains were the key to life-support systems of the whenua.[3] Lowland forests created the conditions of light, water temperature, nutrients, spawning grounds, stable stream beds, and protective cover that sustained freshwater fish as they migrated from the sea into the upper reaches of streams. Swamplands supported cabbage trees, flax, and eels, which were staples of some South Island hapu.[4]

Dominating the swamp-forests, before clearance and drainage for agriculture, was the kahikatea. Park describes kahikatea as the fruit basket of the forest; mature trees produced abundant crops of berries harvested by birds, rats, reptiles, and humans.[5] Waikaka (spring eels, mudfish), a prized delicacy of Maori for presentation at feasts, hibernated during summer drought in cavities beneath the roots.[6]

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1. G Park, *Nga Uruora/Groves of Life: Ecology and History in a New Zealand Landscape*, Wellington, Victoria University Press, 1995, p 54
2. H Beattie, *Tikao Talks: Traditions and Tales told by Teone Taare Tikao to Herries Beattie*, Wellington, Reed, 1939 (Penguin, 1990), p 136. In the South Island also, 'Owing to the vast number of birds and the small population these birds did not need to be hunted with the elaborate preparations used in the northern island.'
3. Park, p 13
4. Nineteenth-century lists of South Island mahinga kai (food-gathering places) refer most often to eels, fern roots, and cabbage trees as food sources (R M McDowall, *New Zealand Freshwater Fishes: A Natural History and Guide*, Auckland, Heinemann Reed and MAF publishing, 1990, p 408, citing A J Anderson's evidence presented at the Waitangi Tribunal hearing, Tuahiwi Marae, 1988).
5. Park, pp 36, 206. Maori kahika is derived from *kafika, the tropical Pacific malay apple, *Syzygium malaccense*, a tree of fruitful abundance.
6. W J Phillipps, *The Fishes of New Zealand*, New Plymouth, Avery, 1940; McDowall, *Natural History*, pp 143, 416

Tracts of swamp, with pools enclosed by flax and raupo, occupied gaps in the kahikatea forests. Inanga in vast numbers, shortfin eels, and giant kokopu migrated into these territories. The great fisheries harvests of swamp-plain rivers such as the Manawatu, Waikato, and Waihou were derived from the vast area of lowland swamp-forest watered by these rivers.[7]

Lowland forests contained berry-bearing groves which supported the birds Maori most prized. Kahikatea, matai, maire tawake, hinau, porokaiwhiri, totara, rimu, and puriri provided a year-round supply of berries for pigeons (kereru) and parrots (kaka, kakariki, kakapo) which were the quarry of hunting, snaring, trapping, and decoy techniques. In Maori usage, the berry of a tree may have its own name;[8] a trapping technique may have its own vocabulary.[9] The flesh of berry-eating birds is particularly sweet, and it is the berry-eating kereru and kaka which North Island hapu caught with the greatest variety of trapping techniques. Maori also gather the berries of the kahikatea, matai, rimu, and many other trees, the fruiting heads of kiekie and many other plants. Forest berries are a nutritional fallback for most birds and reptiles, and for kiore.

The kereru is the last remaining species in the New Zealand fauna to survive while solely depending on a year-round supply of berries. The parrots (kaka, kakapo) are also conspicuous consumers. The mohua group (whitehead, yellowhead, brown creeper) supplement their diet with berries; kiwi, weka, pukeko, and takahe are opportunistic scroungers. Maori hunt all birds whose flesh is palatable. Kokako, although a berry-feeder, is unpalatable, along with the bittern. Pigeons, solely dependent on berries, are prized amongst forest products, especially when the fat is scented from eating miro berries.[10]

The lowland forests also provided warmth, maintaining large populations of birds through the winter. Pigeons habitually fly daily from the mountain ranges down to the lowland forests to feed, and remain seasonally in the lowland forests to nest and winter over.

Forest floors supported a rich terrestrial fauna of insects and invertebrates, providing a food source for birds, reptiles, fish, and humans; the inundation of forest floors with river silt and leaf litter provided fertile soils for agriculture.

From the late eighteenth century, Maori interests in maintaining the traditional forest economy were challenged by the opportunities of a world market, as some hapu recognised the value of forest timbers to British maritime interests. In 1801 William Wilson, captain of the London Missionary Society ship *Duff*, notated a chart of the Waihou River mouth, where the Hauraki plains meet the Firth of Thames:

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7. R M McDowall, *The New Zealand Whitebait Book*, Wellington, Reed, 1984, p 122
8. For example, koroi is the berry of kahikatea, *Dacrycarpus dacrydioides*; horeto is the ripe fruit of poroporo, *Solanum aviculare*; tawhara is the edible flower bract of kiekie, *Freycinetia baueriana banksii*; and so on. J Beever, *A Dictionary of Maori Plant Names*, Auckland, Auckland Botanical Society, 1987.
9. The techniques are illustrated in J White, *The Ancient History of the Maori*, 7 vols, Wellington, Government Printer, 1887–1891.
10. M Orbell, *The Natural World of the Maori*, Auckland, Collins, 1985, p 23; J W Lock, personal communication

> As the object of ships going to the River Thames [Waihou] is to procure Spars, the best season is from the beginning of November . . . Short timber may be got from the Hehe a cheif on the Eastern [bank][11]

In 1840, many hapu, while prosperously engaged in a dual economy, maintained their interests in the self-sustaining harvests of the lowland forests. By now, however, the silt-rich plains were the prime lands intended by Pakeha for an agricultural economy.[12] The forests were harvested by Maori until their productivity was lost through land sales, confiscations, denials of chosen reserves, subdivision into small blocks,[13] saw milling, illegal grazing and timber cutting, land-clearance, swamp-drainage, and the inroads of introduced species. The stands of ragged kahikatea, unfenced, trampled by stock on the plains of Hauraki, are the remnant of Maori interests in a forest economy.

3.2 Critique of Colonial Impact

In 1840, awareness of the need to secure forest protection was global. From 1600 commentary on the destructive impact of European economic activity on colonised people and lands had reached London from settlers, governors, natural philosophers, scientists, and explorative thinkers who had participated in European colonial expansion, and observed deforestation and land degradation at first hand. In New Zealand 'the early colonial conservationists . . . were able to foresee, with remarkable precision, the apparently unmanageable environmental problems of today'.[14] The colonies were centres of environmental discourse.[15]

Extensive descriptions of the damaging ecological effects of deforestation and European plantation agriculture in the Canary Islands and Madeira had existed from around 1500,[16] and in the West Indies from 1560. Some of the worst consequences of early colonial deforestation were documented in the island colonies of St Helena during 1760 to 1794, and Mauritius during 1722 to 1790.[17]

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11. Reproduced in Park, p 57
12. Park, pp 94, 98
13. The policy of creating individual titles to land resulted in small stands of forest and fragmented ecosystems. Small forest stands support many fewer species than large stands. 'In New Zealand the number of bird species that can survive in a forest decreases as the size of that forest is reduced . . . We can expect to lose about 10 percent of our forest bird species for every halving of forest area'. K R Hackwell, D G Dawson, 'Designing Forest Reserves', *Forest and Bird*, vol 13, no 8, p 8).
14. M M Roche, *Forest Policy in New Zealand*, Palmerston North, Dunmore Press, 1987, p 12. For example, Alexander von Humboldt in 1808 put forward a new ecological concept of the subordination of man to other forces in the natural world, and of the ecological threat posed by the unrestrained activities of man, which was published in London in an English translation in 1849 (A Humbolt, *Ansichten der Natur*, Berlin, 1808; A Humboldt, *Aspects of Nature*, trans. Mrs Sabine, 8 vols, London, 1849). Giving priority of the welfare of the natural world is currently advocated in some third world and ecological discourses, see R E Grumbine, 'What is Ecosystem Management?', in *Conservation Biology*, vol 8, no 1, 1994, pp 27–38.
15. R H Grove, *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600–1860*, Cambridge University Press, pp 2–3
16. R Bryans, *Madeira, Pearl of Atlantic*, London, 1959
17. Grove, pp 1–6, 474–476

From 1650 a coherent, organised, and wide-ranging critique had attributed environmental degradation to the economic demands of colonial rule. The Dutch, English, and French East India trading companies, and later the New Zealand Company,[18] employed medical surgeons and botanists, 'highly educated and often independent thinking colonial employees', who became 'an essential part of the administrative and hierarchical machinery of the new trading companies' and who were at the same time 'committed professional scientists and environmental commentators'.[19] Groves comments that the large-scale environmental modification promoted by colonial enterprise invited analytical thinking about the processes of ecological change, about the role of colonial rule, and about new forms of land use, and after 1750 climatic theories gave a scientifically reasoned force to conservation:

> By the end of the eighteenth century . . . new environmental theories, along with an ever-growing flood of information about the natural history and ethnology of the newly colonised lands, were quickly diffused through the meetings and publications of a whole set of 'academies' and scientific societies.[20]

Amongst these societies was the London Society for the Encouragement of Arts, Manufactures and Commerce, later the Royal Society of Arts, which engaged in vigorous conservationist lobbying.[21] London also was the location of the Colonial Office, which from 1763 administered St Vincent, and from 1840, New Zealand.[22]

3.3 What the Crown Knew in 1840

In 1760, Vattel's *Law of Nations* was translated into English. This tract legitimated colonial annexation and the acquisition of sovereignty, by reference to the exercise of forest clearance and cultivation. Vattel's thesis was that as human population

18. The operators of the New Zealand Company were also participants in the wider colonial enterprise. Russell Ellice, for example, was a merchant in the East India trade, a foundation member of the New Zealand Company in 1825, a director of the New Zealand Company in 1839, and chairman of the East India Company in 1853.
19. Grove, p 7. Ernst Dieffenbach, naturalist to the New Zealand Company, and Ferdinand Hochstetter, geologist to the Auckland province, recorded observations on colonial impact in New Zealand (E Dieffenbach, *Travels in New Zealand*, London, Murray, 1843; F Hochstetter, *New Zealand, Its Physical Geography, Geology and Natural History*, Stuttgart, Cotta, 1867). Alfred Thomson (Surgeon-General of the 58th Regiment) and Edward Shortland (member of the Royal College of Physicians, and Native Secretary) included medical section in their ethnographic observations. E Shortland, *Traditions and Superstitions of the New Zealanders*, London, 1856; A S Thomson, *The Story of New Zealand: Past and Present – Savage and Civilised*, London, 1859.
20. Grove, p 8
21. Grove, p 11
22. In 1763 two Lords Commissioners for Trade were members of the London Society of Arts, and theories of the climatic consequences of deforestation can be recognised, incorporated into colonial land settlement and forest policy (Grove, p 274). London continued to be a centre of incoming reports. In 1852 Scottish scientists working for the East India Company published a 'Report of a Committee Appointed by the British Association to Consider the Probable Effects . . . of the Destruction of Tropical Forests'. The report 'took a global approach, drawing on evidence and scientific papers from all over the world' (Grove, p 11).

increased, those who did not cultivate the land had no right to retain control of the land:

> The cultivation of the earth . . . forms the resource and the most solid fund of riches and commerce . . . the sovereign ought not to allow either communities or private persons to occupy large tracts of land in order to have it uncultivated. These rights of common, which deprive the proprietor of the free liberty of disposing of his lands . . . are contrary to the welfare of the state . . . at present, when the human race is so multiplied it could not subsist, if all nations resolved to live in that manner.[23]

At the same time, however, ideas of the impact of modern economic activity, of species extinction, and of climatic consequences of deforestation, were being exchanged between colonial botanists and colonial administrators. A common matrix of ideas seems to have been applied first in the Caribbean colony and then in New Zealand.

Britain annexed the Eastern Caribbean islands (St Vincent, Tobago, Dominica, and Grenada) in 1763, and by 1764 programmes of forest protection were quickly being put into effect, though without reference to indigenous Carib interests in the forest. An ordinance of 1765 stated that woodlands should be preserved 'as shall seem necessary for the constitution and repair of fortifications and public buildings and to prevent that drought which in these climates is the usual consequence of a total removal of woods' and granted that 'the native Caribbees of St Vincent are to remain undisturbed in the possession of their cottages and goods' and receive 'full rights as British subjects'.[24] At the same time the 1764 land proclamation had made no provision for Carib modes of forest use nor for their common ownership of land; the land was to be surveyed, redistributed, and sold.[25]

The chief settlement commissioner believed that if the indigenous Caribs were 'assured of the enjoyment of their lands, freedom, favour and protection' they would cooperate with British colonial settlement.[26] Towards forests, however, he promoted a subversive policy: he accorded priority to sugar production on cultivable lowland and shifted forest reserves to 'hilly areas'. He shared the settlers' hostility to indigenous forest, which he described as 'hot and reeking' and amongst 'the chief obstructions to the [speedy settlement of the colony]'.[27] From the Treaty of 1840 to the New Zealand Forests Act 1874, New Zealand's colonial administrators and settlers echoed the same themes.

By 1850 'the problem of tropical deforestation was conceived of as a problem existing on a global scale and as a phenomenon demanding urgent and concerted state intervention'.[28] During the 1870s, ideas of timber famine, and of the influence of forests on climate, soil erosion, and flood protection appeared in New Zealand

23. E de Vattel, *The Law of Nations, or Principles of Natural Law, Applied to the Conduct And Affairs of Nations and Sovereigns: A Work Tending To Display The True Interest of Powers*, London, 1760, p 37
24. PRO, CO 106/9, cited by Grove, pp 271–272
25. Grove, pp 286, 287, 290, 291
26. Grove, p 285
27. Grove, p 273
28. Grove, pp 1, 5, 6

parliamentary debates leading up to the Forests Act 1874. Charles O'Neill expressed concern for a future timber famine, and quoted from G P Marsh; Donald McLean referred to problems of flooding and of reduced rainfall caused by deforestation; while Julius Vogel supported his advocacy of the New Zealand Forests Act with examples from British, French, Indian, Australian, and American developments.[29]

At the time of the forest debates New Zealand's Governor was Sir James Fergusson, who had served in India; Grove comments that India eventually provided a pattern for colonial state conservation in South-East Asia, Australasia, Africa, and North America.[30] Fergusson supplied Vogel with international papers on the sustained use of forestry, and in 1874 Donald McLean recommended that the New Zealand Government appoint a professional forester 'who had served some time in the Forest Department in India'. In 1875 an Indian forester, Captain Inches Campbell Walker, was appointed New Zealand Conservator of Forests.[31]

New Zealand legislators, however, gave forest conservation their own reading. While McLean spoke of conservancy of forests and rivers, his memorandum emphasised rivers as transport routes;[32] Vogel advocated management of indigenous forest in order to discharge the colony's public debt;[33] opponents of the Bill considered the presence of indigenous forest an obstacle to settlement, organised state forestry was resisted, and Campbell Walker was not voted a salary.[34]

In essence, New Zealand legislators intended to exploit indigenous forests for revenue from sawmilling, while converting the landscape to an agricultural and pastoral economy. Land for Pakeha settlement would be met by clearing indigenous forest. Timber famine would be averted by afforestation with exotic species. [35] New Zealand's indigenous forests were to be a single, valuable crop.[36]

Thus, during the nineteenth century there were disparities between the scope of French social and environmental reforms in Mauritius, the involvement of British scientists in forest-conservancy in India, and the lack of action by the British Crown in its colonies. Grove notes that in Mauritius, the scientific voice was anti-capitalist, and the elite valued the environment, that is, the intellectual forces behind state action in Mauritius saw forest protection as an essential component of radical social reform.[37] In New Zealand, governing and statutory bodies (central government, provincial governments, waste land boards, acclimatisation societies, vermin control boards, county councils, roads boards, regional councils, and so on) have

29. G P Marsh, *Man and Nature*, New York, Charles Scribner, 1864; Roche, *Forest Policy*, pp 71–80; J Vogel, 14 July 1874, NZPD, 1874, vol 16, pp 79–84
30. Grove, pp 11–12
31. Roche, *Forest Policy*, pp 76, 80–81, citing Cabinet memorandum, 3 March 1874, F10/1
32. Roche, *Forest policy*, p 75, citing Appointment of Conservator of Forests, 11 March 1874, F10/1, at New Zealand National Archives
33. NZPD, 1874, vol 16, p 75; G Wynn, 'Pioneers, Politicians and the Conservation of Forests in Early New Zealand', in *Journal of Historical Geography*, vol 5 no 2, pp 1–18; Roche, *Forest Policy*, p 77
34. Roche, *Forest Policy*, pp 88, 90
35. Roche, *Forest Policy*, pp 73–79, 95–96
36. Roche, p 23
37. Grove, pp 9–10, 476–477

largely been composed of merchants and land-holders whose interests lie with an acclimatised economy, and who have been allowed relative autonomy.[38] During the New Zealand Forests Act debate in the 1870s, Campbell Walker argued that such control was against the trend of overseas experience, that local bodies were ignorant of forestry practices, and further that they were hampered by a limited viewpoint and fluctuating membership;[39] Walker was not retained as Forest Conservator. In 1996, Regional Councils still grant resource permits for forestry and mining practices.

3.4 NEW ZEALAND'S FOREST POLICY

In 1840 more than 50 percent of New Zealand was forest-covered. Roche recounts that the British Royal Navy made proposals for forest management in March 1840, immediately after the signing of the Treaty. In 1820 the Royal Navy had found New Zealand kauri too expensive, but now Captain Sir William Symonds advised the Admiralty that kauri had become available on 'reasonable terms', and advocated reservation of suitable areas of forest before the lands were settled. However, Crown policy was that land clearance for agriculture took priority over forest, and the Admiralty encountered opposition from the British Colonial Land and Emigration Office, which directed that the requirements of the Royal Navy would conflict with those of the settlers:

> to reserve the forest is to reserve the land, with whatever object it is made Crown Reserves of land in a new Colony are in our opinion impediments to the progress of settlement and hurtful to the interests of settlement.[40]

In 1841 Governor Hobson was advised by the Colonial Lands and Emigration Office to issue timber licences for cutting kauri on Crown wastelands, and to appoint a Conservator of Kauri Forests. When this did not happen, the Crown managed indigenous forests through timber licensing and timber reserves.[41]

Along with Crown regulation of indigenous forests for timber cutting, sawmilling, settlement, and agricultural clearance, settler actions towards the forest included wasteful use, burning, grazing, and illegal cutting on Maori lands,

38. In 1856, control of the disposal of public lands was handed over from the General Assembly to the Provincial Assemblies. Patterson's reconstruction of the members elected to the Wellington Provincial Assembly in 1853 presents an alliance between pastoral farmers with large landholdings, big merchants, and flockmasters (B Patterson, 'Would King Isaac the First Lose his head?', in *New Zealand Studies*, vol 6, no 1, 1996, pp 5, 13).
39. Campbell Walker, AJHR, 1877, C3, p 50; Roche, *Forest Policy*, pp 87–89
40. Roche, *Forest Policy*, p 21, quoting Colonial Land and Emigration Office to Colonial Office, 7 January 1841, No 8, Enclosure 2 G 1/1. Roche notes: 'An alternative strategy was proposed whereby the Crown would have the right to cut kauri on unoccupied land and have a pre-emptive right to purchase kauri on freehold lands at fixed prices. This was a compromise suggestion to sustain the availability of timber supplies and speed the clearance of forest land for settlement'.
41. The Forest Conservator was to have been Captain W C Symonds, but he died in 1841 and no appointment was made (Roche, *Forest Policy*, pp 19–22).

particularly in the Auckland province: 'Control over the use of forest resources on Crown Lands was lacking and in consequence wasteful and illegal use abounded'.[42] In November 1841, Governor Hobson addressed the destruction of kauri forests by gazetting his intention to preserve areas of kauri forest for naval use, and to prosecute misuse of the forest. Roche notes that Hobson had no means of policing the regulations.[43]

Forested land was categorised as 'waste land', which the Crown intended to be subdivided, freeholded, and transposed into profitable production for a market economy. Timber licences were issued for the cutting of forest on Crown land (for sawmilling, hand sawing, fencing, firewood, charcoal). The income from timber licences did no more than equate with the cost of administration; Roche comments that the objective of the timber licence regulations was to protect the rights of sawmillers who had invested capital in technology (saw pits, tramways, and so on). The timber licence regulations were paired with 'depasturing' licences for grazing rights to Crown lands.[44] The Crown treated the forest as a valuable single crop, as an immediate economic resource, and as a hindrance to land settlement and to agricultural production. After one hundred years of kauri extraction, 1790 to 1890, kauri production declined and did not recover.[45] Roche concluded it was not a Crown objective to conserve the forest resource. Nor, it must be concluded, was it a Crown objective to protect Maori interests in the forest as an ever-renewing resource.[46]

From 1840 to 1870 the Crown pursued several agendas: to supply the British navy with timber for ship building and spars; to make available indigenous forests to sawmillers and timber cutters; to secure revenue from timber exports, and to remove indigenous forest so that Pakeha could rapidly settle and establish an agricultural economy.

3.5 Forest Management on Maori Lands

During the 1860s and 1870s relentlessly indiscriminate use of forest lands, invalid licences and transgressions of the conditions under which timber licences were issued, wasteful cutting, illegal cutting on Crown land, and illegal cutting on Maori land became matters of public notice.[47] Roche has reconstructed events in the Auckland province:

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42. Roche, *Forest Policy*, p 37
43. Roche, *Forest Policy*, pp 21, 22, 27
44. Crown Lands Ordinance 1849; Waste Land Act 1854 (Roche, *Forest Policy*, p 23).
45. Roche, *Forest Policy*, pp 23, 27, 29
46. Roche comments that the Crown's relative disinterest in indigenous forest management from 1840 is reflected in the paucity of references to timber licensing in Parliament (Roche, *Forest Policy*, pp 23, 24).
47. Roche, *Forest Policy*, p 30. For example, in 1875, as the Crown negotiated with Coromandel Maori for the purchase of gold prospecting rights, a report from the land surveyor and purchasing agent James McKay alerted Governor Grey to illegal cutting by miners of forest on Maori land (Roche, *History of Forestry*, pp 60–61, citing AJHR 1875, C3, p 2).

Although the Auckland provincial administration was more careful in its handling of timber licensing, illegal cutting on Maori land continued. By December 1873 the situation was sufficiently serious for the Superintendent to place a notice in the gazette to the effect that 'all persons are warned not to damage, cut, fell, remove any timber or underwood of any kind whatsoever growing standing or lying upon the said lands of the Province of Auckland'.[48] Prosecution under the *Crown Lands Act, 1862* was threatened which amounted to a £40 fine per acre of illegally cut over lands with a maximum of £2 per tree where the diameter exceeded 30 inches. Another notice was issued the same day warning the public not 'cut, fell or remove or contract' for any timber on Maori lands where the land title had not been determined by the Maori Land Court or on lands which the government was engaged in purchasing. Provincial and later central government interest in forest management on Maori lands was essentially a North Island question during the nineteenth and twentieth centuries.

The Crown exercised a pre-emptive right to purchase Maori lands from 1840 to 1844 and 1847 to 1862. However, although the authorities would not issue licences to cut timber on Maori land or areas under disputed purchase neither does it appear that they would forbid what in effect was the free use of the forest resources. For example, the *NZ Government Gazette of New Ulster*[49] in 1847 indicated that W. Hart's application for a timber cutting licence for Muddy Creek in Manukau was recognised as being on Maori land but that the Government would not interfere as long as there was no complaint from Maori owners. In the longer term it is evident that Maori land owners were troubled by illegal timber cutting in their lands. Some idea of the magnitude and extent of felling may be gained from the grievances laid before the Provincial Superintendent during the 1870s. While complaints were received from throughout the Province, they were concentrated in Northland, coincident with the kauri timber industry . . .

The Provincial Superintendent's attempts to stop illegal felling by forbidding all Europeans from cutting timber on Maori land was greeted with a mixed reaction. Te Haeru wrote to the Superintendent in 1874 that 'with us alone is the control of our lands'.[50] This summarised the concern of many Maori with more Pakeha Government pronouncements over how landowners might use their lands. Other Maoris had entered into agreements with timber cutters which they were reluctant to break and not only for business reasons: Kikipa wrote that he 'would not depart from any arrangement, nor will I alter my previous thought until the termination of the period agreed upon'.[51] However, in other instances the Superintendent's proclamation was favourably received. Te Matetahi supported the move and drew attention to the 'cultivations of the natives . . . destroyed and fences broken by the timber (cutter)'.[52] Subsequently, there occurred in some areas, a withdrawal of Maori land and labour from the timber trade.[53]

Many European settlers responded negatively to the proclamation. They argued that a basic requirement was being denied to them.[54]

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48. *New Zealand Gazette*, 8 December 1873, 5, p 301
49. *New Zealand Government Gazette of New Ulster* vol 7, no 23, 1847, p 125
50. Auckland Province, Superintendent's inward correspondence, 225/74
51. Auckland Province, Superintendent's inward correspondence, 272/74
52. Auckland Province, Superintendent's inward correspondence, 315/74
53. P W Hohepa, *A Maori Community in Northland*, Wellington, Reed, 1974, pp 39–42

3.6 The New Zealand Forests Act 1874

Up to 1840 traders had harvested the more easily accessible natural resources such as whale and seal fisheries, flax and timber, and after 1840 the expectation remained that the Crown could legitimately harvest the material productions of the land to obtain revenue.[55] From 1820 New Zealand's indigenous forests were successively worked through, first for spars, then for sawn timber, then for minor products: palings, fence posts, railway rails, and firewood.[56] By the 1860s, the Crown's policy of harvesting natural resources had created a landscape of wasteful timber cutting, fire, flooding, and deforestation,[57] and in the late 1860s Parliament took stock of its forestry management practices: 'there was a general consensus amongst the Provincial Superintendents that both licences and timber reserves were wasteful and an ill advised means of forest management'.[58] The Superintendent of Canterbury Province reported that timber licences 'give men the right to go anywhere through the forest and to cut and destroy any quantity of timber . . . They have no permanent interest in the soil they look only to the present and often destroy as much valuable timber as they bring onto the market'.[59]

There was also recognition that indigenous forests were rapidly disappearing. In 1870 Thomas Potts, politician and naturalist, foresaw the 'almost entire destruction of many interesting and valuable species'.[60] In 1874 Otago forest rangers argued that forest resources were not 'super-abundant' and urged 'the community to have existing forests protected from the reckless extravagance which is prevalent in the Province'.[61] In the Waikato Josiah Firth commented, 'the almost total destruction of forests of the North Island is but a question of time, unless stringent measures are taken to conserve them'.[62] The need for forest management precipitated the New Zealand Forests Bill 1874.

During the purchase of Maori lands, central government had acquired large tracts of forest. The abandoned Conservation of Forests Bill 1873 and the New Zealand Forests Bill 1874 'sought to achieve efficient exploitation of forest resources'[63] in the interests of the Crown. Julius Vogel opened the 1874 debate by listing the reasons for forest conservation:

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54. Roche, *Forest Policy*, pp 30–32. Further descriptions of illegal cutting on Maori land, and Maori participation in the timber trade are in M M Roche, *History of New Zealand Forestry*, [Wellington] New Zealand Forestry Corporation and GP Books, 1990, pp 53–54, 57, 61–62
55. Roche, *History of Forestry*, p 46
56. Exports of sawn timber peaked in 1843. In 1853 the value of exported timber peaked at 93,488 pounds (Roche, *History of Forestry*, pp 47, 48, 57).
57. Roche, *Forest Policy*, p 76
58. Roche, *Forest Policy*, p 38, citing AJHR, 1869, D22
59. Roche, *Forest Policy*, p 39, citing AJHR, 1869, D22, p 9
60. T H Potts and W Gray, 'On the Cultivation of Some Species of Native Trees and Shrubs', in *Transactions of the New Zealand Institute*, vol 3, 1870, p 181 (Roche, *Forest Policy*, p 45)
61. Roche, *Forest Policy*, p 38, citing AJHR, 1874, H5, p 18
62. J C Firth, 'Forest Culture in New Zealand', in *Transactions of the New Zealand Institute*, vol 7, 1874, p 183 (Roche, *Forest Policy*, p 55)
63. Roche, *History of Forestry*, p 84

> The Bill . . . embodies a definite proposal for the establishment and management of State Forests. . . . how very large was the demand for timber which arose from our railway works and our telegraph construction and maintenance; how very great were the injuries caused by floods, and how much deterioration our climate was liable to sustain, from the destruction of forests.[64]

Throughout the debates there is no evidence that the Crown had regard for Maori interests, such as protecting mature, berry-rich stands from milling and burning. Since the Crown was to retain a portion of its land purchases, it could fairly have made provision for Maori interests in undisturbed forest (medicinal plants, mature berry-bearing trees, spawning grounds, and so on). Since the Crown utilised state forests to provide itself with railway sleepers and with revenue from timber licences, and to provide settlers with wood for housing, fencing, firewood, and revenue from milling, from Maori perspectives this could fairly have meant reserving forest for a sustained harvest of its natural products (birds, fish, fibre, canoe and carving timbers).

Instead, Vogel advocated exotic tree-planting to compensate for the loss of indigenous forest:

> I have as yet omitted mention of one large advantage derivable from tree-planting – the shelter it affords to land, enabling [agri]culture to carried on . . . all the differences between the civilised uses of a country possessing a sufficiency of timber at its disposal, and a country which is wanting in one of the greatest essentials for the comfort of mankind . . . we must not suppose that 'forest' is a convertible term for 'supply of useful timber'. Indigenous forests may be comparatively worthless in that respect; and it has not in any case been found that forests, when untended and uncared for, are anything like as useful or as prolific as forests that have been carefully cultivated.[65]

Global discourse on the loss of indigenous forests had been marked by concern for timber famine, flooding, soil erosion, and climatic effects, in concert with concern for the prosperity of colonial society. In New Zealand the debate was between politicians concerned that forest conservation would hinder land settlement, and politicians concerned that prosperity of the colonial economy would be hindered by timber shortages, flooding, and soil erosion. When the New Zealand Forests Act was debated in 1873 and 1874, the Crown's response to deforestation did not countenance protecting long-term Maori interests in their harvests of forest flora and fauna; forests remained the resource of sawmillers and timber cutters.[66]

Thus, while Maori insisted on their right to participate in the timber trade as they chose, the Crown involved itself in policies vis-a-vis the indigenous forests which realised its own and settler short-term interests.

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64. J Vogel, 14 July 1874, NZPD, 1874, vol 16, p 79
65. J Vogel, 14 July 1874, NZPD, 1874, vol 16, p 84
66. Roche, *Forest Policy*, p 80

3.7 JUSTIFYING ACCLIMATISATION

As farmers replaced indigenous forest with grasslands, they provided for shelter belts, fuel, and future timber supplies by planting introduced species. Just as the Crown had encouraged the clearance of native forest from 1841, from 1871 it encouraged the planting of exotic species, through tax exemptions, land grants, supplying nursery trees, and statutes.[67] From the 1870s, Monterey pine (*Pinus radiata*) and eucalyptus were favoured.[68] The settlers were building a new homeland, though not, Roche notes, necessarily a replica of Britain, as the exotic species were derived from Europe, Australia, and North America.

Crown and settler inclination to replace the indigenous forest with a new landscape found justification in a scientific idea disseminated globally along with the critique of colonial impact, that stronger invading species inevitably displace weaker indigenous stock.[69] Through recourse to this theory, New Zealand legislators avoided addressing the unsustainability of the Crown's forestry practices. During the debates in the House, John Sheehan justified his opposition to indigenous forest conservation:

> any attempt to preserve native timber in New Zealand will result in failure . . . the same mysterious law . . . by which the brown race sooner or later, passes from the face of the earth – applies to native timber. Wherever grass, clover, and European plants and animals find their way into the bush, the forest begins to decay away, and soon assumes a ragged and desolate condition.[70]

New Zealand surveyors also had observed the die-back of the outer edges of forest stands; they however understood, with original insight, that indigenous forest does not withstand fragmentation by land clearances:

> There is something about our forests, especially the outer edge, that makes them very charming. Nature has provided a more hardy class of trees and shrubs on the outskirts to act as a protection to the more delicate ones within. It may be noticed readily by any one who attempts to preserve small portions of the standing bush, that after a time the edges begin to dwindle, and will in the course of a few years become blasted by the wind and other atmospheric influence.[71]

The conflict between forest management and land settlement reached a peak in the 1980s.[72] In 1896 a timber conference was held in Wellington to address concerns about an inevitable timber famine. The working parties responded to

67. Canterbury Planting of Trees Ordinance 1858; Canterbury Forest Trees Bill 1871; Forest Trees Planting Encouragement Act 1871; Otago Waste Lands Act 1872 (Roche, *Forest Policy*, pp 49–50).
68. Roche, *Forest Policy*, pp 47–48
69. Through readings of Charles Darwin, *The Origin of Species By Means of Natural Selection*, London, 1859; J D Hooker, 'Notes on the Replacement of Species in the Colonies and Elsewhere', in *Natural History Review*, vol 4, 1864, pp 123–127; J D Hooker, 'On the Struggle for Existence Amongst Plants', in *Popular Science Review*, vol VI, 1867, pp 131–139 (Roche, *Forest Policy*, pp 44–45).
70. Roche, *Forest Policy*, p 79, citing NZPD, 1874, vol 16, p 351
71. Edwin Stanley Brookes, *Frontier Life: Taranaki, New Zealand*, Auckland, Brett, 1892, p 173
72. Roche, *History of Forestry*, p 95

overharvesting of the indigenous forests, by arguing that indigenous species were slow-growing, and advocating tree planting with exotic species to create a new forest resource.[73] Still Maori interests in the forest flora and fauna were not debated.

As Roche notes, the forest flora of New Zealand requires growing conditions which are different from the arboricultural and silvicultural techniques appropriate to European trees. By the 1870s several people had established how to propagate native trees successfully. Potts and Gray published 'On the Cultivation of Some Species of Native Trees and Shrubs' in *Transactions of the New Zealand Institute* in 1870, while Hay published 'On the Cultivation of Native Trees' in *Transactions of the New Zealand Institute* in 1872. Roche makes a pertinent comment: Potts and Hay, recognising that indigenous trees could be propagated when the shade and moisture of their forest habitat were replicated, did not use the 'inevitable displacement' arguments of some of their contemporaries.[74] Potts was a member of Parliament, and made his views well known in parliamentary debates. Had there been the will to protect Maori interests in a sustainable forest economy, the Crown could have called on literature, forestry expertise, and original thinking that was immediately at hand.

3.8 Conclusion

Land settlement pressure continued into the twentieth century. From 1890 to 1919, 623,257 acres of state forest lands were revoked for settlement and cleared of indigenous forest.[75] By 1919 60,000 acres had been reafforested with introduced trees, mainly by wealthy landowners, many of whom received government grants of land for doing so.[76]

Fifty years after the signing of the Treaty of Waitangi, the parliamentary debate was over and done with. Those who advocated Pakeha settlement appealed to global discourse on the 'inevitable displacement' of indigenous peoples and plants and achieved the alienation of forest lands for agriculture. Those who advocated forestry, appealed to global discourse on the connection between forests, climate, flooding, and soil erosion, and achieved afforestation with exotic species. Both sides promoted the progress of the colonial economy. It was an entirely Pakeha debate. A sophisticated body of knowledge, developed over centuries of interaction with the forest, was ignored: the knowledge of Maori hapu.

From 1600 to 1860, case studies of colonially induced ecological change had been published, attempts to counteract the process had been tried, conservationist attitudes had been formed, and sophisticated insight into mechanisms of ecological change had been arrived at. Programmes for environmental control had been

73. Roche, *Forest Policy*, p 59
74. Roche, *Forest Policy*, p 45
75. Roche, *Forest Policy*, pp 96–99. In one year, 1897, 20,000 acres of forest was cleared on former Crown lands, particularly in Wellington and Taranaki.
76. Roche, *Forest Policy*, p 57

developed in colonies administered by the Colonial Office, on St Helena and the East Caribbean islands; in Mauritius, new social polity and new forms of land use had been developed; the state of India's forests had been a matter for frequent and detailed strategic discussions in London.[77] In New Zealand, however, the Crown had exercised its pre-emptive right to purchase Maori land, as an opportunity to divest Maori of a sustainable forest economy.

In summary, forest policy was not developed in consultation with Maori, and hapu interests in sustained forest harvests were not protected. At 1840 the Crown had already formed its agenda: land for settlement, timber supplies for export, and revenue for the colony would be secured by milling the forests as a single crop, whether or not Maori participated and benefited.

77. Grove, pp 393, 474–478

CHAPTER 4

RONGOA MAORI – A CASE STUDY OF MAORI INTERESTS IN FORESTS

4.1 The Forest as Pharmacy[1]

The healing practices of Rongoa Maori are among the most cherished customary uses of indigenous flora and fauna. Efficacy depends on intimate knowledge of a forested territory, on purity of river systems, vitality of plant growth, long-term observation of the properties of particular plant communities, and association with ancestors.

4.2 World Systems of Medicine

Every human society has a system of medical practice. New Zealand's colonial history is reflected in the existence of a number of medical systems which command respect, although only one has received statutory legitimation: current New Zealand Government statutes validate and nationalise a system of medical practice (allopathic medicine) that is historically and culturally specific to Europe.

4.2.1 Allopathic medicine

The medical practice supported by the Crown, popularly called modern scientific medicine or conventional medicine (allopathic medicine), is a recently developed, internationalised system based on the technology of chemical extraction. The chemical constituents of plants are extracted and used in pure concentrations in fixed doses beyond which the drug may be toxic; curative effects are often rapid, but may be accompanied by side-effects and long-term deterioration.[1] Healing is effected through direct intervention in the physical aspect of the human being. Some critics note that allopathic practice ignores the restorative influences of hope, meaning, peace of mind, and high spirits which religious and spiritual practices confer. Other critics note that practitioners of allopathic medicine discredit the religious context of indigenous medicine while failing to analyse the biases of their own medical theory.[2]

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1. As in the use of the chemical Lithium for treating schizophrenia; the use of cancer drugs which prevent cells dividing but also damage healthy cells; the use of hydrocortisone for skin eczema.

4.2.2 Herbal medicine

Herbal medicine is an ancient, worldwide, and resilient practice based on a theory of the efficacy of constituent properties in plant and animal life, involvement of multiple aspects of the human being in illness, and the observation that the body's vital force seeks to return the body to health. The practice employs the energetics of whole plant-parts on the premise that nature has balanced the constituents, so making their absorption by the body effective and gentle; substances are used in small amounts to trigger the body's immune system (indirect intervention); the curative effect is slow; and healing involves a multiplicity of practices, not just a medicinal decoction.[3] Healers in many of the world's herbal systems regard their ability to heal and the natural resources they use, as a spiritual gift.

The systems of herbal medicine practised in New Zealand have been transplanted from European, Chinese, Indian and other landscapes, and practitioners participate in a global exchange of knowledge and materials. Many practitioners combine acclimatised plants and imported products with indigenous flora, determining the properties of indigenous plants through an extension of theory or through advice from Maori traditional healers.

Dr Paul Balaiche, professor of herbalism at the University of Paris Nord (France), describes herbalism as the medicine of the 21st century.[4] In many countries both herbal and conventional systems are practised cooperatively, reducing hospital waiting lists and national health bills.[5] Herbs are unsurpassed for treating digestive disorders and strengthening the nervous system, while conventional medicine can effect rapid intervention.

4.2.3 Rongoa Maori

Each of the world's systems of medical practice has been intelligently developed in relation to the natural curative resources available to its community, and in response to the particular disorders, misadventures, and psychology of its community.[6] Maori practitioners adapted their practice to the new diseases introduced by European mariners and settlers: syphilis, gonorrhoea, tuberculosis, influenza, chicken pox, and measles. In 1854, A S Thomson recorded kawakawa being used

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2. The critical literature is reviewed in Malcolm Voyce, 'Maori Healers in New Zealand: The Tohunga Suppression Act 1907', in *Oceania*, vol 60, 1989, pp 99–100.
3. Practitioners of herbal medicine criticise the use of chemical drugs in allopathic medicine, observing that the complaint may be rapidly cured but the body may remain unbalanced and prone to reoccurrence.
4. *The Healing Arts*, Television New Zealand (eTV), 16 October 1996
5. In Britain, nearly 50 percent of doctors refer patients to homeopaths; in France, 25 percent of prescriptions are for homeopathic medicines (Dr Carolyn DeMarco in *New Zealamd Herald*, 27 November 1996, p A17).
6. European doctors had become skilled in repairing sword wounds but had no practice of healing wounds caused by cannon and musket shot: when gunpowder was first adopted during the late Renaissance, hundreds of soldiers died for lack of medical knowledge. Cowan reported that Maori used a decoction prepared from flax for treating gunshot and bayonet wounds (J Cowan, *The Maori Yesterday and Today*, Whitcombe and Tombs, 1930; Christina Macdonald, *Medicines of the Maori*, Auckland, Collins, 1973, p 83).

to treat gonorrhoea, and kareao to treat secondary syphilis,[7] and during the influenza epidemic of 1918 to 1919 a decoction of fern root was used 'with good effect'.[8] Currently, Rongoa Maori employs indigenous and introduced flora and fauna.[9]

Many societies hold written, historical records of the pharmacopoeia of their medical systems. This is not so for Rongoa Maori. Gluckman notes that 'nothing which can be considered a Maori herbal was written in the first half of the nineteenth century'.[10] When European colonisation began in North America during the seventeenth century, the colonists were familiar with the practice of herbal medicine in their own societies, alert to the value of Indian knowledge of the local flora, respectful of Indian practice, and often dependent on it for their survival. By the nineteenth century, when New Zealand was colonised, conventional medicine was a new product of an industrial community in which authoritative Pakeha tended to distinguish between civilised and uncivilised manners on the basis of technology. Further, as Rongoa Maori has a spiritual component, the disapproval of spiritual mentors was damaging. Reverend Richard Taylor excluded Maori parishioners from evening service in 1852 for seeking healing from a tohunga, and in 1860 he described Maori healing as 'filthy physic'.[11]

During early contact however, there was a brief era of reciprocal respect. In 1820 when the *Dromedary* arrived to ship kauri spars, Richard Cruise reported the effective use of Rongoa Maori by the ship's party.[12] During the early 1840s also, reverend Richard Taylor observed that Maori were eager to use European medications.[13] From the late 1840s to the 1860s however, Taylor and other missionaries recorded a persistent use of Rongoa Maori.[14]

Peata (Hoki, possibly a niece of the Ngapuhi ariki, Rewa) and Suzanne Aubert ('Meri Hohepa') became acquainted around 1860 as religious sisters.[15] Peata was 'a woman of mana' and possibly a tohunga makutu. When Mother Aubert became famous for her herbal remedies, she said that she was 'taught everything' by

7. Gluckman, pp 156–157
8. Macdonald, p 108
9. For example, native and introduced species of plantain (kopakopa) are used in treating festering wounds; native leaf slugs and introduced tiger snails (ngata) are used in treating asthma (personal observation). There has been a debate on the extent of pre-European use of medicinal plants by Maori; the literature is cited in Voyce, 'Maori Healers', pp 100–101. During the debate preceding the Tohunga Suppression Act in 1907, Apirana Ngata commented, 'Real remedies for certain complaints natural to the human being are to be found in our own flora. And the tohunga of old were acquainted with the medical virtues and curative properties of a good many of the plants, which are not in the recollection of the present generation' (NZPD, 19 July 1907, p 520).
10. Gluckman, p 155
11. L K Gluckman, *Tangiwai, A Medical History of 19th Century New Zealand*, Auckland, L K Gluckman, 1974, p 158
12. Richard Cruise, *Journal of a Ten Month's Residence in New Zealand*, [1823] Christchurch, Pegasus Press, 1957, p 199
13. Gluckman, p 158, citing Richard Taylor, 'Journal', Auckland Museum Library
14. Gluckman, p 159. Gluckman attributes this to the theological revivals of the King movement and Hauhauism, in response to loss of racial mana and land.
15. Jessie Munro, *The Story of Suzanne Aubert*, Auckland University Press with Bridget Williams Books, 1996, pp 81, 84, 202

Peata,[16] though Aubert had undoubtedly carried on learning from other Maori in Hawke's Bay and Whanganui. In 1894 Aubert won a court case against Kempthorne and Prosser for diluting her decoctions, and thereafter she stopped commercial production,[17] but the efficacy of the Rongoa had been widely attested by Maori and Pakeha.[18]

In 1869 the Crown began disqualifying tohunga and Rongoa Maori, with the Medical Practitioners Registration Act 1869, the Tohunga Suppression Act 1907, and the Quackery Prevention Act 1908, which placed restrictions on the sale of herbal medicines. The British Medical Association and its New Zealand associated doctors discredited herbal medicines.[19] Lange concluded that medicinal herbs comprise a large part of the healing practice of tohunga.[20]

The indigenous medical system, Rongoa Maori, as defined by the National Body of Maori Traditional Healers, works with four life-support systems: taha wairua, taha hinengaro, taha kikokiko, and taha whanau. The National Body holds that Rongoa Maori is for the benefit of those who need it.[21] Profit taking and commercial exploitation – patenting of plant extracts and of genetically altered plants by pharmaceutical companies – is antithetical to this ethos.

Rongoa Maori shares theoretical perspectives and practices in common with world traditions of herbal medicine. However, members of Nga Ringa Whakahaere o Te Iwi Maori, the National Body for Maori Traditional Healing, have not identified with New Zealand medical herbalists, observing that many do not practise within the living traditional cultural fabrics from which their hybrid practices derive, and that many have compromised with the prevailing commercial ethos of New Zealand society.

Maori traditional healers practise as a cottage industry, preparing medicines in a traditional way, not charging for their labour, and not charging for their product. The National Body for Maori Traditional Healing has commented that koha does not sustain the practice of Rongoa Maori, nor the research and development needed to meet the rapid changes of the late twentieth century.[22]

Colonial and modern scientists have described Maori medicine without analysing the theoretical basis of Maori practice, the methods of preparation, or the range and interaction of curative techniques; and have treated all records as national, not recognising that each hapu uses the resources of its own locality. For example the authors of *New Zealand Medicinal Plants* have analysed the chemical constituents of indigenous flora used in Rongoa Maori;[23] Rongoa however heals through the energetics of whole plant-parts; and plant preparations are used in

16. Munro, pp 118, 202
17. Munro, pp 205
18. Munro, pp 119, 202–207
19. Munro, p 205
20. R Lange, 'The Revival of a Dying Race: A Study of Maori Health Reform, 1900–1918 and its Nineteenth Century Background', MA Thesis, University of Auckland, 1972
21. University of Waikato, Rongoa Maori Workshop, Waitaia Lodge, 1996
22. Ibid
23. S G Brooker, R C Cambie, and R C Cooper, *New Zealand Medicinal Plants*, Auckland, Reed, 1991

conjunction with karakia and other healing techniques. Rongoa Maori has its own theory and practice, and unless the theoretical basis of Rongoa Maori is understood, its medical practices will appear disorganised from other perspectives; one system cannot be explained in terms of another. The practices of Rongoa Maori have not been properly described in any published work to date (1996).

New Zealand accords a privileged role to practitioners of conventional medicine. Practitioners of Rongoa Maori are prohibited by statute from describing themselves as doctors, although rata and tohunga are correctly translated by this term. Hostility to Rongoa Maori has no basis in research, but appears instead to be a legacy of a colonial prejudice harboured in New Zealand.

Outside New Zealand, Maori knowledge of the medicinal properties of indigenous flora and fauna is regarded as an invaluable contribution to world scientific knowledge: 'The knowledge of medicinal plants preserved by indigenous specialists is priceless information . . . Without it we must use random screening, which is like searching for a needle in a haystack'.[24] The hostility of New Zealand legislation and state doctors to traditions of herbal medicine[25] limits the capacity of Rongoa Maori to incorporate new methods, to respond to internationally spread diseases, and to develop as a modern medical practice.

4.3 THE TOHUNGA SUPPRESSION ACT 1907

During 1907 the Crown legislated against Rongoa Maori with the Tohunga Suppression Bill. Tohunga are responsible for the wellbeing of their hapu, through their training in specialist knowledge. Bountiful harvests, social wellbeing, ecology, and health are allied in a shamanic paradigm:

> But the catching of the delectable inanga was restricted to periods fixed by the local tohungas after they had invoked the gods of the tribe . . . To ensure that the fish would be afforded every opportunity of making their way up-stream unmolested by fishermen, the tohungas in certain years declared the banks of the Buller "tapu" for a distance of several miles from the mouth. When the fish were considered to have had sufficient time to advance beyond the tapu boundaries, sprigs of kawakawa were cut by the tohungas who then proceeded along the banks of the river in canoes striking the surface at regular intervals with their kawakawa twigs. The action of striking the water which had previously been declared tapu had the effect of removing the prohibition on fishing. The Maori fishermen were then able to construct weirs, and set their eel baskets preparatory to the return of the fully grown inanga to sea. When all the ceremonies were completed, an offering was made to the god (atua) of the river;

24. Malcolm McNeill, 'Intellectual Property Law Reform and the Marginalisation of Maori', MA thesis, University of Auckland, 1995, p 57, citing Elaine Elizabetsky, 'Folklore, Tradition, or Know-How?', in *Cultural Survival Quarterly*, 1991, p 10. Elizabetsky suggests that 74 percent of the chemical compounds used as drugs in conventional medicine have come into use through the knowledge of societies practising herbal medicine.

25. In 1996 some staff at the Auckland Medical School and at National Women's Hospital opposed the use of herbal medicines during childbirth (*New Zealand Herald*, 29 October 1996, p A3).

> the oblation was called 'tiri'. Buller River was called Kawatiri: lifting of tapu and thanks offering made to the atua of the river for a bountiful food supply.[26]

At times of social crisis tohunga may come to the fore as leaders, as happened around 1900 when Maori had lost control of the process of colonisation, identity was eroded as the result of land loss, and communities were depopulated, lethargic, and without strong leaders as the result of infectious diseases and impoverishment.

In the mid-1890s, Maori population reached its lowest numbers.[27] Among the causes were the new infectious diseases introduced by European colonial settlers: measles, chickenpox, tuberculosis, typhoid fever, scarlet fever, diptheria, influenza, and so on.[28] The Minister of Health had failed to provide rural Maori communities with adequate medical services; and while the causes and treatments of the introduced diseases were known in European medical practice, Dr Pomare complained that advice and measures such as vaccination were not made widely available to Maori.[29] James Carroll, Native Minister, recognised:

> the present is a more critical time in the life of the Maori than any other period previous. He is more in want now of medical attendance . . . than ever before. I would suggest that the amount be increased, and the responsibility placed on the Health Department to appoint proper men to attend medically to the Maori race.[30]

Apirana Ngata (Eastern Maori) also placed the Bill in the context of Maori health:

> I think this is the proper place to point out a real grievance on the part of the Maori people, in the lack of enthusiasm displayed by successive Governments in the matter of medical attendance on the Maori sick . . . When the [1897 measles] epidemic went through the [Urewera] district it denuded the two schools . . . If they had had ordinary nursing the loss would not have been anything like that, but under the advice of tohungas they threw themselves into the nearest creek – into cold water – and in two days they were dead . . . There is, therefore, all the more reason why we should make an advance in respect to this matter [here, Ngata is supporting the Tohunga Supression Bill], and I hope that this year the Administration will . . . [make] greater provision for the medical needs of the Maori people.[31]

The annual grant for Maori health in 1907 was £3000. 'Amongst forty-six thousand people what is £3000?' Ngata asked the House.[32]

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26. G G M Mitchell, *Maori Place Names in Buller County*, Wellington, Reed, 1948, pp 45–46
27. The lowest figure was possibly 42,113 in 1896 (P Webster, *Rua and the Maori Millenium*, Wellington, Price Milburn, 1979, pp 143–153).
28. For example, 'In the Urewera district in 1897 there was an epidemic of measles . . . Out of sixteen hundred people one-twentieth died in one year' (A Ngata, 19 July 1907, NZPD, 1907, vol 139, p 521).
29. See the annual reports of Dr Pomare, Health Officer to the Maoris, AJHR, 1902, vol 2, H-31, pp 61–65; 1903, vol 3, H-31, pp 66–83; 1904, vol 3, H-31, pp 56–65; 1905, vol 4, H-31, pp 56–57; 1906, vol 3, H-31, pp 67–68; 1907, vol 4, H-31, pp 52–62
30. J Carroll, 19 July 1907, NZPD, 1907, vol 139, p 525
31. A Ngata, 19 July 1907, NZPD, 1907, vol 139, pp 520, 521
32. A Ngata, 19 July 1907, NZPD, 1907, vol 139, p 520

From 1902 to 1907, annual reports from Dr Maui Naera Pomare, Health Officer to Maori, had sought reasons for the high rate of Maori mortality. Pomare had advocated erecting cottage hospitals in Native districts and adding a special ward or small hospital for Native consumptives, training Maori girls to be graduated nurses, liberally subsidising doctors to do Maori work, introducing a stringent law prohibiting the practice of any kind of tohunga, training instructors to work with Maori advising on baby-care, invalid cooking, and simple medication, carrying out sanitary reforms and propagating knowledge of sanitation, erection of closets, vaccination, deportation of lepers, controlling sale of liquor, abolishing tangi and hui, individualising Native lands and making working the land mandatory, removing poverty and poor living conditions, introducing employment, and improving living standards in Maori kainga.[33] Thus, Pomare intended suppression of tohunga to be one of many measures to improve Maori health. In the parliamentary debates, however, this measure was singled out and the Act was worded to suppress Maori community leaders attempting to restore the wellbeing and political autonomy of their communities.[34] The Act became a witch-hunt against popular Maori opposition to colonial government.[35]

The crisis in Maori health was coincident with the large followings which tohunga attracted, and during the debate in the House tohunga, along with Rongoa Maori, were reviled: 'there is a class of herbalists, and of massage-treating experts, and charlatans of the worst type it is possible to conceive of . . .'[36] To appreciate the perspective of Maori who followed tohunga, it is necessary to understand the shamanic paradigm which connects disease and tohunga. Pomare had reported in 1906 that 'all diseases which cannot be accounted for are considered *mate Maoris*, and no one can cure a *mate Maori* except a tohunga'.[37] Mate Maori is a manifestation of an infringement (hara) of sacredness (tapu), causing the withdrawal of supernatural protection and consequent possession by a malignant spirit. As shaman, the tohunga can discern the path by which a spirit has travelled from the underworld, and instruct it to return, thereby releasing the patient from its ill effects. Where mate Maori is caused by sorcery (makutu), tohunga can counter with their own powerful techniques.[38]

During the debate preceding the second reading of the bill, Shortland's detailed account of tohunga healing was read to the House by Wilford (Hutt), who presented it as an account of pagan witchcraft: 'There is no doubt that the flax-stick of the tohunga is the magician's rod of Tchatcha-em-aukh in Egypt'.[39] Similarly,

33. AJHR, 1903, vol 3, H-31, p 71. Carroll also told the House: 'In most of the outlying districts there are no European doctors within seventy or eighty miles or more' (J Carroll, 19 July 1907, NZPD, 1907, vol 139, pp 524–525).
34. This interpretation is argued by M Voyce, 'Maori Healers in New Zealand: The Tohunga Suppression Act 1907', *Oceania*, vol 60, 1989, pp 99–123.
35. This view is argued by P Laing, 'Tohunga and Witches: Gendered Representations of Maori Healing', in *Maori and White Women: Gendered Representation in the Colonial Construction of Maori Health*, 1996, unpublished manuscript.
36. A L D Fraser, 19 July 1907, NZPD, 1907, vol 139, p 523
37. AJHR, 1906, vol 3, H-31, p 68
38. The literature is cited in Voyce, p 100.

medicinal prescription of brandy by tohunga was discredited as evidence of demoralisation. However, in a shamanic paradigm, healing takes place through the intercession of ancestral spirits. Tohunga are able to 'journey' to realms where illness and healing are dealt with, while common people are assisted by substances which transport the mind to other states of consiousness:

> This lady, this tohunga, went from town to town . . . decrepit Maori women who had never allowed spirits . . . to touch their lips were told that it was the elixir of life, that they would be young again and live for ever as long as they drank neat three-star brandy, and they imbibed it with impunity.[40]

Similarly, the prescription by tohunga of immersion in cold water was criticised as tragically inappropriate for the new diseases; in a shamanic paradigm water is used to lift tapu and thereby free the patient of malignant influences.[41]

There was a real concern with quackery. Opportunistic tohunga who were not competent to deal with the new diseases exploited an incredulous following by appropriating lands and property.[42] This is highlighted by noting that the National Body of Maori Traditional Healers holds an ethos of not charging for healing. Some Maori lodged complaints against tohunga; Voyce has cited records from around 1899 to 1907 in which tohunga were accused by Maori of bewitchment, extortion, and appropriation of money and property. Under section 49 of the Indictable Offences Summary Jurisdiction Act 1894; section 40 of the Criminal Code Act 1894; section 16.5 of the Maori Councils Act 1900; and the Tohunga Suppression Bill 1907, tohunga were charged with murder, given prison sentences, licensed, suppressed, and finally outlawed.[43]

Thus, while Maori directed complaints against the practices of tohunga, and tohunga were convicted and punished, the Crown was withholding from Maori communities knowledge, advice, and medicines appropriate for these new diseases.[44] During the debate in the House, the astute Hone Heke (Northern Maori) was cautious about medical quackery being the real motive for the Bill: 'I say to the Native Minister that if he intends this Bill to be an honest attempt to suppress tohungaism, why apply it to the Maori alone – why not extend it to the pakeha as well?'[45]

It is also necessary to place the tohunga Te Whiti o Rongomai, Te Wetere, Te Ua, Te Kooti, Rua Kenana, Tohupotiki Wiremu Ratana, and others in the context of

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39. Wilford, reading from Edward Shortland, *Traditions and Superstitions of the New Zealanders*, London, Longman, Brown, Green, Longmans & Roberts, 1854, p 126 (19 July 1907, NZPD, 1907, vol 139, pp 516–517).
40. A L D Fraser, 19 July 1907, NZPD, 1907, vol 139, p 523
41. Voyce, p 101
42. Particular cases are cited in Voyce, pp 104–107
43. Ibid, pp 102–107
44. See the annual reports of Dr Maui Pomare. For example, Pomare advocated training Maori nurses to work in Maori communities (AJHR, 1903, vol 3, H-31, p 71). However, over the decade 1901–1911, the Maori Health Nursing Scheme, a Maori initiative, was assimilated by the Public Health Department. Instead of Maori nurses, Pakeha were appointed to the service (Laing and Pomare, 'Maori Health and the Health Care Reforms', *Health Policy*, vol 29, 1994, p 146).

Pacific-wide millenarian movements which have organised indigenous opposition to colonial government. Rua followed Te Kooti in advising Tuhoe to stand against the 'rule of law' by which Maori land had been confiscated; he foresaw that Tuhoe prosperity lay in making their land productive; he was conscious of the need for hygiene and good quality housing.[46] Nevertheless, during the debate in the House, James Carroll, Native Minister, stated:

> The effect of these tohungas is to paralyse the industries in which the Natives are engaged. To create notoriety for themselves, they generally take a hostile attitude to the laws which are in force and which are intended for the general benefit of the community. They also, by the advice they give to their followers, endeavour to as far as possible resist the progress of the higher branches of our civilisation . . . I am now quoting, as a type of this class of practitioner, the notorious Rua . . . Rua started his work in . . . the Tuhoe or Urewera Tribe, who had estranged themselves from all law and order by the non-recognition of Crown rule over their territory . . . This tohunga, Rua, assumed control over the major portion of those people, and persuaded them to part with their belongings, to sell their stock, to leave their cultivations, to withdraw their children from attendance at schools, and to pervert the good effect of all our laws, persuading them that he, constituted as he was, was allied with powers beyond human ken, and would set matters right ultimately . . . What I would ask the House to do is to view the evil effect of the professions of such people – the disastrous result it has on the well-being of a section of our community – and institute such checks as may be advisable.[47]

He was supported by another Maori member, Wi Pere:

> I agree in every sense with the provisions of this Bill . . . I would have had this man collared long ago. This man Rua is exciting a bad spirit. he has told his followers that presently the white people will all be removed from these lands.[48]

Pakeha public opinion also, represented the pacifist political resistance of tohunga as disreputable. Carroll read to the House an article from the Whakatane County Press:

> Fanatical Natives like Rua should be early subdued . . . As a whole, the Native population is much more content with British rule than in days past. Nevertheless, when we hear of sedition being openly preached . . . firm steps on the part of the authorities should be taken to quench it . . .[49]

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45. H Heke, 19 July 1907, NZPD 1907, vol 139, p 513. George likewise told the Legislative Council: 'Why should we pass a special Act dealing with the Natives in regard to their tohungas when, I venture to say, as pointed out by nearly everyone who has spoken in this debate, we Europeans have a greater number of tohungas than the Natives ever had?' (22 August 1907, NZPD, 1907, vol 140, p 380).
46. Webster, p 272; J Binney, G Chaplin and C Wallace, *Mihaia: The Prophet Rua Kenana and His Community at Maungapohatu*, Auckland, Auckland University Press with Bridget Williams Books, 1979, pp 26, 52, cited by Laing.
47. J Carroll, 19 July 1907, NZPD, 1907, vol 139, p 511
48. W Pere, 19 July 1907, NZPD, 1907, vol 139, pp 374, 375
49. J Carroll, 19 July 1907, NZPD, 1907, vol 139, p 511

Several scholars have argued that the Tohunga Suppression Bill was motivated by Pakeha fear that Rua's movement might serve as a focus for Maori resistance to expansion of Pakeha settlement and Pakeha domination in Maori areas.[50] During the debate Stevens (Manawatu) was explicit:

> But in order to bring about a better state, and make the Natives understand there is only one law, some such legislation as this is necessary . . . I think the Maori must be brought into line; and the only way in which to bring him into line is by passing some Act that will give greater and wider powers than exist in the Police Offences Act or Criminal Code Act.[51]

Protestant Christian ministers of the era were widely opposed to pagan witchcraft and included tohunga practices in this category; some support of the Tohunga Suppression Bill may have come from Maori Christians.[52] Within the Catholic church, however, Aubert had worked closely with Peata and other Maori in the preparation and administration of rongoa.[53]

Voyce places the Tohunga Suppression Act also in the context of other coercive legislation adopted by the Liberal Party in conjunction with its social welfare program: female 'repeat offenders' were sent to a mental institution; 'surplus' labourers were sent to a state farm; there were attempts to control tramps and swaggers; and tohunga 'of the Rua type' were described in the House as 'no good to the country'.[54]

Munro has examined the reasons for Mother Suzanne Aubert's decision to stop public sale of her rongoa: the unauthorised dilution of decoctions by her distributor, the court case, and the unwelcome publicity. Munro comments:

> But her growing involvement with the medical world led her away from patent medicines. By 1908 the Quackery Prevention Act had, at least officially, tightened up on them. The British Medical Association and its New Zealand associates would have nothing to do with the purveyors of patent medicines. One doctor referred to her disparagingly as 'Mother Seigel', the ever-present American medicine-maker in the newspaper columns. Suzanne, fiercely proud of her integrity in medicine and wanting to be associated with professionalism, was stung. 'New Zealand's vegetatist' stopped making her medicines.[55]

Concurrently, Maori names were disappearing from scientific papers in the *Transactions of the New Zealand Institute*. Colonial men of science were establishing the integrity of their new professions by discrediting and disparaging all other systems of knowledge.

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50. Laing cites Binney, Chaplin, Wallace; Webster; Voyce.
51. Stevens, 19 July 1907, NZPD, 1907, vol 139, p 514
52. This is explored by Laing.
53. Munro, pp 119, 206–207. Aubert and Peata met in 1861. Aubert's practice of Rongoa Maori probably continued until the Quackery Prevention Act 1908.
54. Voyce, pp 108–110; Wilford, 19 July 1907, NZPD, 1907, vol 139, pp 517–518
55. Munro, p 205

Some insight into one faction of support for the suppression of tohunga comes from the 1962 repeal of the Act, when Eruera Tirikatene (Southern Maori) stated:

> I prefer the old idea of social and economic advancement towards perfection according to Western culture . . . After all, we could not follow the old culture and at the same time live as Europeans . . . After the 1914–18 war, the late Tohupotiki Wiremu Ratana stood out against the power and authority of tohungaism, and proved the power of Christianity . . . He taught the Maori that the power of God transcended everything and that the Maori should foresake his belief in tohungaism.[56]

The Tohunga Suppression Bill was supported by Maori doctors trained in western medicine and by the Maori members of Parliament: Maui Pomare, Te Rangi Hiroa (Peter Buck), James Carroll (Native Minister), Hone Heke (Northern Maori), Henare Kaihau (Western Maori), Apirana Ngata (Eastern Maori), Tame Parata (Southern Maori), Wi Pere (Legislative Councillor), Mahuta Tawhiao (Legislative councillor), Potatau te Wherowhero (Legislative Councillor) all supported it or did not speak against it.[57] Laing argues that Dr Maui Pomare and Te Rangi Hiroa, as did the popular press, constructed tohunga in a new way, as medical charlatans and pseudo-priests, in order to stop indigenous healers from practising. Laing attributes three agendas to this representation of tohunga. Firstly, Pomare, Buck, and others were emerging as a new kind of leader whose authority lay in their modern, western education, that is, they were challenging the leadership of tohunga. Pomare repeatedly wrote in his annual reports that contemporary tohunga were diverting their followers from the sanitary reforms that would reduce deaths from contagious diseases. Secondly, the tide of colonial medical opinion was against traditional healers and herbal medicine.[58] Thirdly, Buck and Pomare had been trained in western professions and believed that prosperity lay in assimilation: 'There is no hope for the Maori but in the ultimate absorption by the pakeha' Pomare wrote in an annual medical report.[59] Laing and Pomare state unequivocally that the Act was passed as a 'tool of assimilation . . . an attempt to curtail the role of traditional Maori healers (tohunga) in favour of conventional Western medical practice'.[60]

Laing summarises the dilemma: 'It was an assertion of colonial power over the Maori body using medical men as agents of empire which impacted profoundly on a contest over Maori leadership.'[61] Te Whiti o Rongomai, Rua Kenana, and other tohunga sought to counter Maori demoralisation through retrieving the religious and political force of hapu-based society. Leaders of the Ringatu, Ratana, and Anglican religions displaced ancestral powers with Christian faith-healing.[62]

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56. E Tirikatene, 13 December 1962, NZPD, 1962, vol 333, pp 3359, 3360
57. 19 July 1907, NZPD, 1907, vol 139, pp 510–525; Te Rangi Hiroa, *The Coming of the Maori*, Wellington, Maori Purposes Fund Board, 1949, p 407
58. Munro, p 205–206
59. M Pomare, 'Report of Dr Pomare, Health Officer to the Maoris', 2 August 1906, AJHR, 1906, vol 4, H-31, p 67
60. P Laing and E Pomare, 'Maori Health and the Health Care Reforms', *Health Policy*, vol 29, 1994, p 146
61. Laing, 'Tohunga and Witches', p 12

Pomare, Buck, Eruera Tirikatene, and other new Maori leaders sought greater Maori participation in colonial society to bring about sanitation, land reform, and rise in standard of living.

While Maori leaders vied, colonial society instated its own values and secured its own prosperity; and a ragged body of rural Maori waited in vain for health assistance.

4.3.1 The suppressed agenda of the parliamentary debate

My reading of the debates in the House (19 July) and in the Legislative Council (22 and 23 August) is this: If the objective of the Government was to improve Maori health, the Bill undermined this by outlawing all tohunga, both charlatans and profoundly knowledgeable health practitioners, as Rigg told the Legislative Council: 'besides the mystic and quack there is also a genuine healer of diseases . . . persons who may possess this healing-power and who should not be interfered with'.[63] Maori health would have been better served by the provision of funding and training, as McCardle told the Legislative Council: 'What is wanted is that medical men should be appointed to go amongst the Natives and induce them to adopt proper sanitary methods, to see that they get proper food and attention during illness . . . and if that were done I think we would soon see the last of tohungaism'.[64]

Pomare in his reports, and Heke and others who debated the Bill in Parliament, advocated that the suppression Act should apply to both Maori tohunga and Pakeha untrained medical practitioners.[65] The passing of a Bill which treated Maori differently from Pakeha required judicial compromises. George expressed his reservations to the Legislative Council:

> But I do not altogether believe in this method of passing Acts dealing with one portion of the people of the colony . . . it is not right that a measure should be passed simply for the purpose of dealing with the one race when the Europeans are even more guilty than the Natives'.[66]

So did Samuel:

> this is to a certain extent exceptional legislation . . . We should be extremely careful how we add to the category of crimes, and we should be still more careful how we discriminate between one portion of the people of the colony and another.[67]

So did Findlay:

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62. Voyce, p 114
63. 22 August 1907, NZPD, 1907, vol 140, p 377
64. Ibid, pp 381
65. M Pomare, 'Report of Dr Pomare, Health Officer to the Maoris', AJHR, 1904, p 60; H Heke, 19 July 1907, NZPD, 1907, vol 139, p 513
66. 22 August 1907, NZPD, 1907, vol 140, pp 380, 381
67. Ibid, p 381

> The first point we should keep clearly in mind is that we should not impose upon the Native race of this colony a law which differs from the law imposed upon ourselves without the best and most conclusive reasons.[68]

Other judicial reservations were voiced by Kelly:

> [The Bill] gives the power to two Justices of the Peace to fine or imprison for practising as a tohunga. Now, that is a most improper power to place in the hands of mere Justices of the Peace, who may have no judicial minds or legal knowledge. Such a power should only be exercised by a Stipendiary Magistrate.[69]

Further, if the objective of the Bill was to suppress charlatans, legislation already existed under which tohunga had been successfully prosecuted.[70] This was pointed out during the debate:

> so far as this debate is concerned I question whether the Bill is necessary. It seems to me that the power which the Government possess at the present time under three different Acts quoted by the Attorney-General ought to be sufficient to deal with the gentleman who seems to have caused the introduction of the Bill – the so-called prophet Rua.[71]

The use of the Bill to suppress Rua Kenana was widely acknowledged during the debates:

> Tonight we find it necessary to bring down special legislation to deal with an individual . . . the raising . . . to statutory fame – a contemptible illiterate Maori called Te Rua. That is the whole object of this Bill.[72]

What did Rua and his fellow tohunga represent that the New Zealand Government was prepared to suppress, at the expense of depriving Maori of much-needed health practitioners and to the prejudice of judicial fairness? What does the National Body of Maori Traditional Healers mean when they say the Tohunga Suppression Bill struck at the core of Maori culture?

During the 1907 parliamentary debate, tohunga were described as the repositories of tribal history and tradition, propitiators of the gods to secure sufficiency of food and success in war, seers, and mediums between the living and dead.[73] Tohunga represented Maori leadership in domains of deeply learned religious knowledge and skilfully executed political power outside the ken of colonial society: 'The law that governed the tribe emanated from [the tohunga]'.[74]

These domains of Maori culture were designated primitive, pagan, and evil during the parliamentary debate. Collins proposed, 'with the help of those Maoris

68. 23 August 1907, NZPD 1907, vol 140, p 404
69. 22 August 1907, NZPD, 1907, vol 140, p 378
70. For example in 1894 Mapu, a Kaikohe tohunga, was convicted under section 49 of the Indictable Offences Summary Jurisdiction Act for prescribing open air dips for a child, who then died (Voyce, p 104).
71. G J Smith, 22 August 1907, NZPD, 1907, vol 140, p 384
72. A L D Fraser, 19 July 1907, NZPD, 1907, vol 139, pp 522, 523
73. Captain Tucker, 23 August 1907, NZPD, 1907, vol 140, pp 400–401

who have been trained for the medical profession and also with the assistance of a Bill of this kind, these things will have a great effect in averting the evil influences of the tohungas'.[75] Jones was similarly convinced that 'all that is necessary to abolish this superstition [tohungaism] is intellectuality and education'.[76] Wigram proposed, 'we might eliminate the word "tohunga" from the Bill altogether. The measure, I think, should be called "The Maori Superstition Act," and its object should be to protect the Maori race from the improper exploitation of its superstitions'.[77] Stevens proposed that 'one solid example . . . will do more to suppress Hauhauism and witchcraft than all the attempts at persuasion.'[78]

Laing comments that characterising the practices of all Maori tohunga as witchcraft and medical quackery denied to tohunga their dignity as respected teachers, healers and leaders, and instead positioned tohunga as disreputable, marginal to society, and objects of a legitimate suppression.[79]

Under the leadership of tohunga, Maori had the force to determine their own uses of Christianity, education, and medical practice, and to recover their own political will. Wilford indirectly made this point: 'The tohunga has started to undo practically the whole of the good work done by this colony through its legislation by means of educating the Maori race'.[80] Stevens concurred: 'in order to bring about a better state, and make the Natives understand there is only one law, some such legislation as this is necessary.'[81] McCardle announced: 'I will support the Bill. It is a dangerous thing to give the Natives the idea that there is something superior in tohungaism'.[82] Captain Tucker was equally frank: 'the concourse of a large number of strangers in one place living a life of idleness, and breathing . . . a desire that the whole of New Zealand should come back into the hands of the Natives, and that the Europeans should disappear – these sentiments are not calculated to inspire a very great deal of confidence in settlers'.[83]

The Suppression of Tohunga Act gave the colonial government a legal means to suppress Maori identity, Maori resistance, and Maori political autonomy.

4.3.2 Repeal of the Tohunga Suppression Act

Regulation of tohunga was re-enacted in section 14 of the Maori Purposes Act 1949. Voyce examined National Archive records up to 1955, when tohunga had

74. A Ngata described the pre-colonial tohunga: 'The law, which meant life and death, which dealt with everything pertaining to their cultivations, everything pertaining to their industries, everything pertaining to their moral life, and everything pertaining to their religious life, emanated from the tohunga. His word was law' (19 July 1907, NZPD, 1907, vol 139, pp 518–519).
75. 22 August 1907, NZPD, 1907, vol 140, p 379
76. Ibid, p 383
77. 23 August 1907, NZPD, 1907, vol 140, p 402
78. 19 July 1907, NZPD, 1907, vol 139, p 515
79. Laing, 'Tohunga and Witches', p 3
80. 19 July 1907, NZPD, 1907, vol 139, p 516
81. Ibid, p 514
82. 22 August 1907, NZPD, 1907, vol 140, p 381
83. 23 August 1907, NZPD, 1907, vol 140, p 401

become uncommon in Northland and the East Coast, but could not establish definitively what the impact of the Act had been.[84] In 1962 the Maori Welfare Act repealed the Tohunga Suppression Act.[85]

Laing and Pomare argue that as a result of the 1907 Act, Maori indigenous healers went underground, and did not begin to publically assert themselves until the 1980s; traditional Maori leadership was discredited; the challenge to the assimilationist visions of the new leaders such as Sir Maui Pomare and Sir Peter Buck was annulled; and stigmatism was added to the demoralising stresses affecting Maori wellbeing: 'In terms of Maori having control over their own health care, the suppression of indigenous healers was potentially disastrous.'[86] The National Body for Maori Traditional Healing argues that the Act disqualified Maori from legally practising Rongoa Maori. Many whare wananga disappeared overtly. The Act struck at the core of Maori culture.[87]

Hostility to Rongoa continued after 1962 (see chronology). Te Puea validated traditional healing but feared prosecution.[88] In 1974 the medical psychiatrist L K Gluckman described Rongoa Maori as 'a negative influence'. He made no analysis of the theoretical basis of Rongoa Maori, believed the practice to have developed after colonial settlement, and represented Maori knowledge as disorganised.[89]

During the 1990s, United Nations working papers, reports, charters and conventions formulated the right of indigenous communities to custody of their traditional resources. In 1992 a United Nations preliminary report included those physical resources (biodiversity) indigenous to the territory of an indigenous people, in intellectual forms of property.[90]

In 1993 the First International Conference on the Cultural and Intellectual Property Rights of Indigenous Peoples was held at Whakatane. Here, the Mataatua Declaration was signed by 150 indigenous communities and tabled before the United Nations. The Declaration stated:

> Indigenous flora and fauna is inextricably bound to the territories of indigenous communities and any property right claims must recognise their traditional guardianship'.[91]

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84. Voyce, pp 113–116
85. NZPD 1963, vol 333, pp 2693–2704, 3357–3361. In 1960 the Hunn Report had recommended the legal differentiation between Maori and Pakeha be eliminated (Voyce, p 116).
86. Laing and Pomare, pp 144, 149; Laing, 'Tohunga and Witches', p 17
87. Chairman (A Clark), Nga Ringa Whakahaere O Te Iwi Maori, personal communication, 1996
88. M King, *Te Puea: A Biography*, Auckland, Hodder, 1977, p 171
89. Gluckman, pp 153–159: 'originally the Maori had a minimal system of medical practice ... After European contact ... The pseudopriests began to find curative properties in different plants which they kept secret so as to acquire more followers ... Beyond the few plants used for minor ailments, the possibilites of herbal remedies were not explored by the Maoris ... the tohunga to try and retain his influences in the face of missionary activity was compelled to imitate the healing techniques of the missionary and a debased form of medical practice developed in the 1850s.'
90. McNeill, p 53, citing UN E/CN.4/Sub.2/1992/30:2
91. McNeill, pp 60–61, citing section 2.6

Also in 1993 the United Nations Working Group on Indigenous Populations released a report stating that 'each indigenous community must retain permanent control over all elements of its heritage'.[92] Rongoa Maori is an intellectual property which has been acquired through 'research and development' over many centuries to the present.[93] However, under GATT legislation, to which New Zealand became a signatory in 1993, indigenous resources, and knowledge of their uses, are treated as 'public domain' and are appropriated without recompense to indigenous peoples for their right of ownership. Yet once the resources are commodified (made into drugs) they become subject to patent laws and are sold at profit-taking levels.[94]

In 1994 the United Nations released a report, 'Principles and Guidelines for the Protection of the Heritage of Indigenous Peoples', stating that 'Indigenous peoples' ownership and custody of their heritage must continue to be collective, permanent and inalienable, as prescribed by the customs, rules and practices of each people'.[95]

McNeill's researches suggest that this declaration was made in response to expropriation of indigenous biodiversity and scientific knowledge: the gene poor 'North' has long relied on and exploited the genetically rich 'South' for food and plant materials. An intensified search for new drugs, and improvements in biotechnology, has seen the rate of this gene and knowledge transfer accelerate.[96] He cites King: 'The age of biotechnology has given rise to . . . "the last great resource rush" as companies . . . search the world for the new raw materials of their industry: wild strains of plants and animals from which they can extract genes to develop new chemicals, flavorings, food, drugs . . . biotechnology is expected to grow from a $4 billion to a $50 billion industry.'[97]

Notwithstanding the dissemination of United Nations statements on the rights of indigenous peoples, the New Zealand Government has continued to pass legislation which does not recognise and protect Maori interests in flora and fauna (see below). Rongoa Maori is taught skilfully in the Centre for Continuing Education at the University of Waikato, otherwise the theoretical bases of Maori classification of flora and fauna, and the tenets of Rongoa Maori are not taught in any New Zealand scientific or medical institution.

In 1996, issues of concern to Nga Ringa Whakahaere o Te Iwi Maori, the National Body for Maori Traditional Healing (MTH), included:[98]

(f) Rangatiratanga granted under the 1840 Treaty is the right of Maori to determine their own destiny. Conservation statutes have pre-empted and fragmented Maori management of indigenous flora and fauna.[99]

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92. McNeill, pp 66–67, citing Daes (UN) E/CN.4/Sub.2/1993/28:para 30
93. For example, Aubert 'applied her knowledge of chemistry and botany [to native medicinal plants] . . . [Maori] seemed to relate to her as a developer of Maori medicine' (Munro, pp 202, 206).
94. McNeill, p 56, citing Elizabetsky, p 12
95. McNeill, pp 67–68, citing Daes (UN) E/CN.4/Sub.2/1994:5
96. McNeill, p 55, citing Jack Kloppenburg, 'No Hunting! Biodiversity, Indigenous Rights and Scientific Poaching', in *Cultural Survival Quarterly*, 1991, pp 14–18
97. McNeill, p 56, citing Jonathon King, 'Breeding Uniformity: Will Global Biotechnology Threaten Global Biodiversity?', in *The Amkus Journal*, 1993, p 25
98. University of Waikato workshop at Waitaia Lodge (Tauranga), October 1996.

(g) Maori traditional healers are the guardians of Rongoa. The National Body (MTH) seeks control of flora and fauna with medicinal uses.

(h) Under present legislation, the Patent Office has allowed 17 patents over indigenous plant properties. Maori question the validity of these patents, and seek their revocation and a cessation to the issuing of patents. Further patents have been applied for. Some processes of gene manipulation are being used to circumvent patent rights (koromiko is no longer koromiko).

(i) Biogenetic manipulation produces bastard species, which cross with wild species, producing species of unknown properties. As these are released, Maori will lose control of the medicinal properties of the true wild species on which their medicinal practice depends. The New Zealand Government has stringent statutes, and departments of research scientists, working to prevent foreign agents such as fruit fly that would endanger agriculture, from entering the country. Maori seek similar protection for the wild medicinal plants, from the release of nursery hybrids and genetically altered species which have the capacity to cross with indigenous species.

(j) Resources are finite and rapidly disappearing. The National Body seeks right of access to the medicinal resources in reserves and, where necessary, limitation of access to Maori traditional healers only.

(k) On the principle of oritetanga (equity and parity), the National Body (MTH) is seeking recognition of Rongoa Maori as a legitimate medical practice, and direct funding for Nga Ringa Whakahaere o Te Iwi Maori to establish a research and training centre.

(l) Maori have not been adequately consulted – note their exclusion from the six years of consultation during the GATT (Uruguay Round), 1986 to 1993.

McNeill also has commented on the exclusion of Maori from the writing of the legislation, and he has given examples of Maori rights not being recognised in New Zealand statutes. His examples include the signing the GATT Agreements. Here, New Zealand is participating in the universalisation of a western intellectual property model which is antithetical to Maori interests and may disadvantage, marginalise, and disenfanchise Maori. He gives the example that there are three limitations on the usefulness of patents for the protection of indigenous peoples' heritage: (a) patents only apply to 'new' knowledge; (b) rights are ordinarily granted to individuals or corporations, rather than to cultures or peoples; and (c) the rights granted are of limited duration. Patents are therefore not useful for protecting traditional or 'old' knowledge, or knowledge which people wish to retain as confidential.[100]

McNeill has also addressed international copyright legislation. This legislation does not protect orally transmitted knowledge; some rights are threatened by the operation of the statutes; and Maori are denied the right to use their own cultural definition of 'intellectual property' (which for Maori has a spiritual dimension) and

99. The Crown took over management of wildlife through the schedules of the Animals and Plant Protection Acts, from 1867 on.

100. McNeill, p 57, citing Daes (UN)E/CN.4/Sub.2/1993/28:para 136

of 'ownership' (which in the terms of the legislation, for Maori is neither a national 'social good' nor 'individual', but is hapu-based).

When New Zealand signed the GATT (Uruguay Round) Agreement in 1993, the Agreement on Trade Related Aspects of Intellectual Property (TRIPS) required member countries to standardise domestic legislation to accord with international intellectual property law.[101] New Zealand, however, is a bicultural country, requiring unique legislation. The final GATT Agreement did not contain provision that 'nothing in this legislation will contravene the Treaty of Waitangi'. The legislation has placed Maori on the back foot, and will require Maori to participate in an expensive legal contest.

McNeill describes in detail how Maori are being marginalised in the Justice Department's reform process and how they are unable to influence its outcome.[102] The National Body of Maori Traditional Healers confirmed the experience of being unable to influence legislative reform through the scepticism of Government departments ('Is Maori healing real?'), lack of clear explanation, and brevity of consultation.[103]

4.4 CHRONOLOGY

The chronology records pre-colonial practice of Rongoa Maori; adoption of European medicines during the 1840s; practice of Rongoa Maori during the 1850s and 1860s; suppressive legislation around 1900; recognition of the rights of indigenous people internationally from 1980; exclusion of Maori from the writing of New Zealand statutes on intellectual property rights and from policy advice; absence of research and development funding for Rongoa Maori; protection of indigenous fauna under the Biosecurity Act; Crown versus Maori on the issue of poison drops; Crown versus Maori on the issue of introducing viral diseases; Crown versus Maori on the issue of forest sanctity and water purity.

1774. At Queen Charlotte Sound, Cook reported the curative use of a 'sauna' with herbs (tutaekoau).[104]

1820. Richard Cruise observed that Maori 'have recourse to different herbs and plants, with which they seem extremely well acquainted; and one of the gentlemen who was afflicted with an eruption on his lips, was cured by the application of a decoction of herbs given to him by a native'.[105]

1816 to 1826. John Rutherford observed the use of herbs to staunch bleeding and ease pain.[106]

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101. McNeill, p 47
102. McNeill, p 51
103. University of Waikato, Rongoa Maori Workshop, Waitaia Lodge, 1996
104. Macdonald, pp 116–117
105. Macdonald, p 32
106. Gluckman, p 152

1840. John Johnson observed the use of steam baths at Ngawha, lined with flax, and the therapeutic value of the waters of Rotorua.[107]

Early 1840s. Reverend Richard Taylor observed Maori were eager to use European medications.[108]

1852. Reverend Richard Taylor excluded Maori from evening service 'for having their sick to a native doctor'.[109]

1857. Reverend T Chapman observed that whereas Rotorua Maori had formerly sought European medicines they were now making their own [Rongoa Maori].[110]

1857. Reverend C Baker observed that Maori were using their own medicines to cure illness. 'I have protested against this most strongly and have posted up a notice on the church door condemning the practice.'[111]

1858. Reverend William Puckey observed that Kaitaia Maori had 'cast away medicine we had sent them and were using a Maori nostrum'.[112]

1860. Reverend Richard Taylor blamed the 'filthy physic' of Maori medical practitioners for the death of a woman.[113]

1861. Reverend William Puckey observed, 'the greater part of the Maoris throughout the land seem to . . . place more confidence in the Native Doctor than in their European medical attendant'.[114]

1869. Medical Practitioners Registration Act imposed state control on the medical profession.[115]

1893. Criminal Code Act. Section 240 of this Act followed English statutes suppressing witchcraft and was used to prosecute tohunga.[116]

1894. Indictable Offences Summary Jurisdiction Act. Section 49 of this Act was used to prosecute tohunga.[117]

1898. *Otago Daily Times*, 11 August carried a sensational story about tohunga.

1899. New Zealand police were alerted to an increase in the activities of tohunga.[118] Tohunga were warned by public notice that they should not practice faith healing.[119]

1900. *New Zealand Herald*, 14 September carried a sensational story about tohunga.

1900. Liberal government practiced a policy of assimilation of Maori by western civilisation. The Maori Councils Act gave limited powers of regulation to the councils in respect to tohunga.

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107. Gluckman, p 152
108. Gluckman, p 158, citing Richard Taylor, 'Journal', Auckland Museum Library
109. Ibid
110. Gluckman, p 158, citing T Chapman, 'Letters and Journal 1830–1869', Auckland Museum Library
111. Gluckman, p 158, citing C Baker, 'Journal 1827–1867', Auckland Museum Library
112. Gluckman, p 158, citing W G Puckey, 'Letters and Journals 1831–1868', at Auckland Museum Library
113. Gluckman, p 158, citing Richard Taylor, 'Journal', Auckland Museum Library
114. Gluckman, p 159, citing W G Puckey, 'Letters and Journals 1831–1868', Auckland Museum Library
115. Munro, p 118
116. Voyce, 'Maori Healers', pp 103–104
117. Voyce, 'Maori Healers', p 103; Laing, 'Tohunga and Witches' (no page numbers)
118. Voyce, 'Maori Healers', p 103, citing Justice Department files
119. Voyce, 'Maori Healers', p 103

1902. *Poverty Bay Herald*, 24 March carried a sensational story about tohunga.

1907. Tohunga Supression Act. 'Whereas designing persons, commonly known as *tohungas*, practise on the superstition and credulity of the Maori people by pretending to possess supernatural powers in the treatment and cure of disease, the foretelling of future events, and otherwise, and thereby induce the Maoris to neglect their proper occupations and gather into meetings . . .'

1908. Quackery Prevention Act placed restrictions on the sale of herbal medicines.[120]

1949. Peter Buck concluded from his ethnographic researches that Maori had highly developed systems of medical, surgical, and psychological practice.[121]

1961. Crimes Act repealed witchcraft legislation.

1962. Maori Welfare Act repealed the Tohunga Suppression Act.

1970s. Cultural pluralism (multiculturalism) was publically debated.

1977. 30th World Health Assembly of the World Health Organisation passed a resolution promoting training and research in traditional systems of medicine.[122]

1981. Minister of Justice established the Intellectual Property Advisory Committee to examine reform of copyright law (Copyright Act 1962). There was no Maori input.[123]

1982. The United Nations established a Working Group on Indigenous Populations, under the Sub Commission on Prevention of Discrimination and Protection of Minorities. The group completed a draft declaration on indigenous people's rights, which Te Puni Kokiri released in 1994.[124]

1982. Neuman and Lauro identified 'the pervasiveness and persistence of traditional medicine' as one of three leading factors in the expansion of health care services.[125] In 1994 Laing and Pomare noted that health care reforms in New Zealand had still not accommodated this factor and improvement in the health of Maori had not been realised.[126]

1984. Labour government adopted a policy of biculturalism. Maori slowly developed a strong partnership with the Department of Health.[127]

1984. The findings of the Hui Taumata were used by the Labour government to justify privatisation and minimalist Government intervention, as consistent with Maori desire for self-determination. To 1994 the Government had not provided funding and resources for Maori to achieve this.[128]

1985. Minister of Justice released a discussion paper, 'Reform of the Copyright Act 1962'.[129]

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120. Munro, p 205
121. Peter Buck, *The Coming of the Maori*, Whitcombe and Tombs Ltd, 1949
122. Laing and Pomare, p 148
123. McNeill, p 32
124. McNeill, p 65
125. A K Neuman and P Lauro, 'Ethnomedicine and Biomedicine Linking', in *Social Science and Medicine*, vol 16, 1982, p 1818.
126. Laing and Pomare, p 153
127. Laing and Pomare, p 146
128. Laing and Pomare, p 152
129. McNeill, p 32

1986. Uruguay Round of the GATT negotiations was launched in Punta del Este (Uruguay).[130]

1988. Ministry for the Environment Hui at Maketu Marae (Kawhia). Maori stated the need for New Zealand scientists to accept the validity of Maori scientific perspective. Discussion on new organisms.[131]

1988. Ngaati Awa and Ngaati Te Ata introduced a 'Draft Article on the Cultural Property Rights of Indigenous People into the United Nations Draft Declaration on the Rights of Indigenous People'.[132]

1988. Labour government adopted a policy of privatising health. Maori developed partnerships with Area Health Boards.[133]

1989. Minister of Justice released an analysis of reform alternatives, 'The Copyright Act 1962: Options for Reform'.[134]

1991. Wai 262 Flora and Fauna Claim lodged with the Waitangi Tribunal by six iwi: Ngaati Kurii, Te Rarawa, Ngaati Wai, Ngaati Porou, Ngaati Kahungunu, Ngaati Koata. The claim notified Government of Maori concern at the release of genetically modified indigenous flora and fauna 'without Maori sanction or input'.

1991. Government commercialised health, necessitating that Maori develop a relationship with the Regional Health Authorities and Crown Health Enterprises. Maori petitioned for the inclusion of Maori traditional healers among the list of practitioners who could provide core health services for Maori.[135] Laing and Pomare concluded that 'A Maori reading of the Green and White Paper suggests that policy-makers have seriously misunderstood and misrepresented Maori criticism of the old health care stystem . . . [The replacement of a holistic definition of health with a fragmented 'integrated' approach] attempts to alienate Maori from their indigenous healing system'.[136]

1992. Maori expressed unease at the absence of a Treaty clause in the Health and Disability Services Bill. Government advised that health was not an Article 2 issue.[137]

1992. World Conference of Indigenous Peoples On Territory, Environment and Development was held at Kari Oca [known as the Rio or Earth Summit]. The conference addressed the erosion of the world's resources of biodiversity. Agenda 21 stated that indigenous peoples should be allowed to actively participate in the formulation of national policies, laws, and programmes. The Convention on Biodiversity stated that governments shall support local

130. McNeill, p 47
131. McNeill, p 90
132. McNeill, p 66
133. Laing and Pomare, p 146.
134. McNeill, p 32
135. M H Durie, U K Potaka, K H Ratima, M M Ratima, 'Traditional Maori Healing: Paper Prepared for the National Advisory Committee on Core Health and Disability Services', Palmerston North, Department of Maori Studies, Massey University, 1993
136. Laing and Pomare, p 151
137. Laing and Pomare, pp 146–147

populations to develop and implement remedial action in degraded areas where biological diversity has been reduced.[138]

1992. The United Nations included flora and fauna (biodiversity) and knowledge of medicinal plants in definitions of indigenous intellectual property which has been subject to expropriation by western commercial and scientific enterprises.[139]

1992. Rongo Wirepa/the Core Health Services Committee – now the National Health Committee – received a report on policy advice to the Government from Apera Clark. The report requested recognition and direct funding for Maori traditional healing. The report was commissioned by the Ministry of Health and Te Puni Kokiri. Policy was also being developed by the Central Regional Health Authority, who questioned whether Maori healing is real.[140]

1992. 'Nga Kaiwhakaora Turoto me te Hurihanga Hauora' hui held at Takapuwahia marae (15 to 17 May). This was a congress of Maori healers: rongoa consultants and practitioners, who challenged the Government for the failure of its health reforms to recognise and fund Maori traditional healers. Present at the hui were Katheryn O'Reagan and Sharon Crosby. The Conference resolved that an interim task force would develop a constitution for a National Board for Maori health; this would be a fifth Regional Health Authority which would receive direct funding from the Government, rather than being slotted into the existing health structure.[141]

Outcome: a National Board for Maori health was established and named Te Waka Hauora. This board was formed by the National Maori Congress, the National Maori Council, and the National Maori Women's Welfare League. The board's purpose was to provide advice and guidance to the Minister of Health, the Public Health Commission, the RHAs and CHEs, and to support Maori health initiatives. The National Body for Maori Traditional Healing (MTH) was excluded.[142]

1992. 'Nga Whare Watea' hui held at Porirua (28 to 30 August). Following the Tohunga Suppression Act of 1907 a great deal of curative knowledge had been lost, healing practices had become insular, and a multiplicity of new healing methods had been developed independently in each tribe. Practitioners recognised there was a need for a national healing agency with a charter of healing practices. At this hui a national board for rongoa was established and named Nga Ringa Whakahaere o Te Iwi Maori, the National Body for Maori Traditional Healing (MTH).[143]

1992. 'Rongopai' hui (25 to 27 September), convened by Nga Ringa Whakahaere o Te Iwi Maori. At this hui, a constitution was drafted and adopted in principle. Delegates were officially installed from all the nine iwi regions, so that the body

138. McNeill, pp 68–69
139. McNeill, p 53, citing E/CN.4/Sub.2/1992/30:2
140. Chairman (A Clark), Nga Ringa Whakahaere o Te Iwi Maori, personal communication, 1996
141. Apera Clark, personal communication, 1996
142. Laing and Pomare, p 151
143. Chairman (A Clark), Nga Ringa Whakahaere o Te Iwi Maori, personal communication, 1996

speaks for all Maori. Two delegates were appointed to the Aotearoa Science Network.[144]

1993. Hui at Ngati Otara marae (26 to 28 February), convened by Nga Ringa Whakahaere o Te Iwi Maori. At this hui, the constitution of the National Body of Maori Traditional Healers was officially registered; Clark and Pang instituted a research programme on interfacing; and the need for accreditation was tabled.[145]

1993. The First International Conference on the Cultural and Intellectual Property Rights of Indigenous Peoples was held at Whakatane (June). The Mataatua Declaration was signed by 150 indigenous communities and tabled before the United Nations in July.

1993. The United Nations released its study on the Cultural Rights of Indigenous Peoples.[146]

1993. New Zealand ratified the Convention on Biological Diversity (September). Biosecurity Act 1993.

1993. Hui at Otiria marae (2 to 5 November) convened by 'Te Waka Hauora', the Government's National Board for Maori Health. Te Waka Hauora had excluded Maori traditional healers from its composition, but it now convened a conference on indigenous healing. At the hui, Te Waka Hauora was challenged by Nga Ringa Whakahaere o Te Iwi Maori for developing policies based on the kaupapa, tikanga, and taonga of Maori traditional healing. The National Body for Maori Traditional Healing advised the Crown: 'We are the guardians and the gatekeepers of the intellectual properties of rongoa rakau, rakau rongoa, and tikanga rongoa pertaining to Maori Traditional Healing.'

A proposal to establish a database in Tahiti for all indigenous healers and healing, was opposed by the Chairman and Secretary on behalf of Nga Ringa Whakahaere o Te Iwi Maori, the National Body for Maori Traditional Healing, on the grounds:

(a) Maori needed to go pan-tribal before going pan-pacific;
(b) cultural intellectual property rights and safety were not guaranteed;
(c) Maori did not have ready access to French Polynesian territories (a visa was required for entering Tahiti).[147]

1993. Hui at Ngati Tukorehe marae (13 to 15 November). At this hui Dr Bob Boyd and Dr Susan Martindale gave assurances that:

(a) The Government will not legislate nor impose controls on Rongoa Maori and has no political agenda to do so;
(b) Rongoa Maori has been exempted from the Medicines Review Act, because practitioners do not charge for services and medicines;
(c) Product Licences will not be required for Rongoa Maori medicines.[148]

144. Ibid
145. Ibid
146. McNeill, p 66, citing Daes (UN) E/CN.4/Sub.2/1993/28/paras 4,5,19,20
147. Apera Clark, personal communication, 1996
148. Ibid

1993. Conclusion of GATT Uruguay Round. Agreement on Trade Related Aspects of Intellectual Property (TRIPS) signed by New Zealand (December). McNeill comments that this agreement required New Zealand to comply with the 1971 revision of the Berne copyright convention, and to standardise domestic legislation to accord with international intellectual property law. The New Zealand legislation has no statement protecting Maori interests.[149]

1994. Laing and Pomare concluded, 'The reformed health care system does not recognise the indigenous healing system [Rongoa Maori]'. They noted that no Maori member was included in the task force that prepared the Green and White Paper (1991) on which the health care reforms were based; that there were no plans to include traditional healers among the practitioners providing core health services; and that although Maori 'have held strong to a Maori vision of autonomous health care', Government has not provided the resources for the vision to be realised. They recalled the WHO resolution of 1977 promoting training and research in traditional systems of medicine.[150]

1994. The United Nations released 'Principles and Guidelines for the Protection of the Heritage of Indigenous Peoples'.[151]

1994. Te Puni Kokiri released 'Te Ara o Te Ao Tuuroa: Biodiversity and Maori'.

1994. Te Puni Kokiri released 'Mana Tangata: Draft Declaration on the Rights of Indigenous Peoples 1993'.

1994. Maori Congress hui held at Takapuwhaia marae (Porirua) (February). The Congress rejected New Zealand's ratification of the GATT (Uruguay Round) Agreement.[152]

1994. Copyright Bill. McNeill notes that the legislation on Intellectual Property was rushed to meet the deadline for ratification of the GATT:TRIPS agreement; the public was given little time to consider its implications and to prepare submissions. 'Ultimately ... the passage and form of the act was ... dramatically affected by New Zealand's international relationships; specifically, by our emergent obligations under the GATT:TRIPS Agreement'. Maori interests were not protected. Tau Henare's proposal that a Treaty of Waitangi protection clause be included was rejected.[153]

1994. Intellectual Property Law Reform Bill. A Treaty of Waitangi protection clause was not included, and Maori interests were not protected.

1994. The International Association of the Mataatua Declaration made a submission to the Ministry of Commerce select committee affirming to the New Zealand Government the Declaration of Cultural Property Rights of Indigenous People (August).[154]

1994. Submission to the Minister of Maori Affairs (Koro Wetere) by Apera Clark on behalf of the National Body of Maori Traditional Healers (MTH), objecting

149. McNeill, p 47
150. Laing and Pomare, pp 150, 153
151. McNeill, citing Daes (UN) E/CN.4/Sub.2/1994:5
152. McNeill, p 97, citing J Kelsey, 'Submission', 15 August 1994
153. McNeill, pp 47, 48, 85
154. McNeill, p 66

to the use of 1080 poison drops and noting that 1080 sours the ground and alters the medicinal properties of plants. The submission was discounted by the Minister on the advice that 1080 poison dissipates quickly.[155]

1994. During December 9 to 14, the Ministry of Commerce held four hasty consultation hui for Maori on topics relating exclusively to the Intellectual Property Law Reform Bill (specifically not to the GATT (Uruguay Round) Bill). The Copyright Bill was enacted 15 December.[156]

1995. Ratification by New Zealand Government of the GATT (Uruguay Round) Agreement (January). McNeill comments that the GATT:TRIPS Agreement 'can accurately be described as the internationalisation of US intellectual property law . . . intention is primarily to facilitate the opening up of new markets for its growing, technology based industries'. Maori interests were not protected. A Treaty of Waitangi protection clause was not included.[157]

1996. Auckland Regional Council published 'Plant Pests of the Auckland Region', as part of its 'Regional Plant Pest Management Strategy', to meet its responsibilities under the Biosecurity Act 1993. The scheduled plant pests comprised introduced species which displace indigenous plants. One hundred and nineteen introduced species were banned from sale, propagation, and distribution, as by garden centres, and so on. Land owners became responsible for their eradication: 'This strategy places requirements upon land occupiers to control plant pests to prescribed standards'.

1996. Waikato Regional Council Hearings Committee heard submissions from Moehau Nga Tangata Whenua Trust Board and Te Ruunanga A Iwi o Ngati Tamatera, opposing an application from Coeur Gold for water and discharge permits at Waitekauri. The submissions notified the council of the nature of tangata whenua relationships with the natural and physical resources of the Waitekauri forest, citing in particular the intrinsic value to Maori of water. The submissions were over-ruled.[158]

1996. 60th anniversary commemoration of the death of Sir Maui Pomare. Naere Pomare addressed the hui and called for the banning of 1080 poison, citing reports from professional hunters and trappers of large numbers of dead birds, including kiwi, kereru, and tui.[159]

Estimate by the Government's Biosecurity Advisory Group that $38 million dollars was spent in 1996 on aerial poison drops to control possums in forest blocks. The Department of Conservation spent $15 million; Regional Councils spent $5 million; Animal Health Board spent spent $18 million.[160]

Conservation Director of the Royal Forest and Bird Protection Society reported that 50 percent of the robins in Pureora Forest and a significant number of the tomtits had been killed by the winter 1080 campaign to poison possums.[161]

155. Chairman (A Clark), Nga Ringa Whakahaere o Te Iwi Maori, personal communication, 1996
156. McNeill, p 83
157. McNeill, p 75
158. Environment Waikato, ref 60 14 20A
159. *Evening Post*, Wellington, September 1996
160. *Rural News*, 7 October 1996, p 3

Rural News reported 'a large and growing antipathy to mass 1080 airdrops' in the West Coast and Taranaki regions. A petition was signed by 7000 Taranaki ratepayers, requesting an end to poison drops, the introduction of a national possum bounty, and the commercialisation of possums. The petitioners noted that large areas of forest throughout the country were being destroyed, airdops of poison were not effective, and incurred huge national cost. The petition was supported by Taranaki's eight Maori tribes.[162]

1996. Opposition to the release of a 'rabbit calicivirus' in Australia and New Zealand became global. Chinese scientists reported that the virus may be a parvovirus with the capacity to jump species; American veterinary pathologist Dr Douglas Gregg supported this interpretaton; veterinary scientists at Cambridge University described the release as 'inherently risky'; Professor Al Smith at Oregon State University warned 'New Zealand and Australia could be playing with fire'.[163] In New Zealand the Royal Forest and Bird Protection Society opposed the release, while four regional councils, the Commissioner of Crown Lands, and South Island High-Country Federated Farmers' groups have applied to import the virus.[164] Environment Waikato announced it supported the release of the virus and would act as an agent for its release in the Waikato area.[165] The release of the virus is opposed by the National Body of Maori Traditional Healers.[166]

4.5 Interests of Maori Traditional Healers

The practice of Rongoa Maori depends on accurate knowledge of the properties of each life-form, acquired through many generations of practice, using wild plants. Wild plants transmit their properties from generation to generation, and establish footholds in particular localities. Maori practice is based on the premise that each named plant-form has the properties traditionally accorded to it, and for this reason the practice of Rongoa Maori cannot be separated from Maori classification of indigenous flora and fauna. Traditional healers have interests in the research and teaching of Maori classification, as a science.

Plant properties are not used as a recipe book. A substance may occur in different amounts in different parts of the plant, so that an extract prepared from the root would be toxic while an extract prepared from the leaf tips would be restorative; new leaves may contain different quantities from old leaves; a plant-form growing in one location may be more potent than the same plant-form growing in other places; plant parts harvested in the early morning may be more potent than plant parts harvested in the heat of the day. Experienced practitioners develop a practice

161. *New Zealand Herald*, 28 October 1996, p A8
162. *Rural News*, 7 October 1996, p 3
163. *Farm Equipment News*, 1 October 1996, pp 1, 17
164. *New Zealand Herald*, 2 November 1996, p A4
165. *Hauraki Herald*, 8 November 1996, p 34
166. University of Waikato, Rongoa Maori Workshop, Waitaia Lodge, 1996

which integrates inherited knowledge, new observations, new materials, and new knowledge. Traditional healers have interests in the teaching of Rongoa Maori alongside world traditions of herbal medicine.

Restoring and retaining the integrity of the forest is most important for Maori practitioners of herbal medicine, whose medicinal materials are harvested from indigenous flora and fauna. Practitioners of Maori medicine need:

(a) Forest blocks within their own rohe. Here practitioners can attend to the ancestral presences and sacred places in the forest; intercede with their ancestors to protect the mauri of the forest and its life-forms; and harvest legitimately.

(b) Stable forest blocks. Here practitioners can come to know intimately the locations of particular plants; harvest each plant according to their own wise judgement of how much harvesting it can sustain; husband the forest so that the plants they need thrive in accessible locations; observe and experiment over long periods of time; control variables, knowing which particular plant-material has been gathered; and so develop their practice scientifically.

(c) Forest blocks large enough to be self-sustaining. In natural communities seasonal cycles are completed, while birds, fruits, insects, stream floods, fish migrations, and so on, fully interact, so that medicinal resources thrive; a full range of materials needed in the preparation of medicines can be found; and the materials harvested are potent.

(d) Husbanded forest blocks. Forests are currently degenerating because of opossom, deer, pig, and goat grazing do not meet medicinal standards.

(e) Authority to place tapu and rahui on forest blocks used as pharmacies. It is antithetical to Maori practice to prepare herbal medicines from a poisoned or soiled environment. Trampers, deer-stalkers, pig-hunters and their dogs, and trail-bike riders damage plant associations and disturb the careful husbandry which medicinal healers maintain through karakia and methods of rotational harvesting. Bait-poisons contaminate stream waters and enter the ecosystem. Mining, forestry, milling, and agricultural enterprises release effluents and toxins into waterways.

4.6 RONGOA MAORI AND THERAPEUTIC LEGISLATION

In 1907 the Tohunga Supression Act disqualified Maori healers from legal medical practice. The National Body for Maori Traditional Healing describes the Act as gross cultural injustice: many whare wananga disappeared, and there was a great loss of traditional knowledge. The Act was repealed in 1964, but the Crown has remained hostile to the practice of Rongoa Maori, excluding Maori teachings and teachers from medical schools, medical degree examinations, and medical research funding.

New statutes may again marginalise Rongoa Maori. Pending legislation, being drafted by the Ministry of Health,[167] may prohibit growing and use of scheduled non-indigenous medicinal plants, and would thereby prevent practitioners of Rongoa Maori from incorporating herbal medicines used in theoretically compatible systems of medicine, such as practised by Chinese and North American healers. As a consequence New Zealand legislation could block Rongoa Maori from participating in the international development of herbal medicine.[168]

Current New Zealand Government statutes (Therapeutic Legislation, Medicines Review Act) have been designed for synthetic chemical drugs; they validate and nationalise a system of medical practice (allopathic medicine) that is historically and culturally specific to Europe. Rongoa Maori draws its strength from a spiritual dimension, through karakia, and its medicines from whole-plant preparations whose efficacy is known from generations of use, not from chemical analysis. Most plant-parts do not contain a single active principle, but are complex. Complexes are not easy to assess by the available experimental methods used in chemical laboratories. That is, exact chemical proof of the mode of action of analgesics, sedatives, tranquilisers, and anxiolytes cannot be provided by chemical analyses; if the same criteria are applied to the plant medicines of Rongoa Maori, and to herbal traditions worldwide, only a few of the powerful curative plants will be able to meet these criteria, using currently available scientific methods.

In the practice of herbal medicine globally, and in the practice of Rongoa Maori locally, clinical experience demonstrates that the complexes of active principles found in whole plant-parts offer particular advantages in terms of tolerance, better absorbtion, and lower toxicity. Practitioners of herbal medicine employ decoctions in conjunction with fasting, exercise, diet, massage, laughter, karakia, stress reduction, and lifestyle changes, to balance energy flows and revitalise the immune system, so that the patient self-heals. 'Wholistic medicine' is beyond the capacity of analysis by the methods used in testing synthetic drugs. Current New Zealand statutes marginalise the tradition of holistic medicine, and thereby marginalise Rongoa Maori.

The statutory definition of medical proof of medical efficacy is derived by chemical analysis of the constituents of a drug. This definition of what constitutes proof (chemical analysis) and what constitutes efficacy (chemical components) forces practitioners of Rongoa Maori to argue their case on the terms of an alien medical system, instead of on the terms of their own practice. This is inconsistent with the Mataatua Declaration of 1993. Maori are forced to defend their rights within a disempowering political structure. This is inconsistent with the Treaty of Waitangi.

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167. For example, the new Medicine Act currently being drafted by the Therapeutic Legislation section of the Ministry of Health, and the limitations on usage of herbs scheduled by the Medicines Advisory Committee.

168. For example, *Lobelia inflata* is legally used by registered medical herbalists in the United Kingdom. In New Zealand, however, the Medicines Advisory Committee has proposed restricting the use of *Lobelia* to pharmaceutical companies.

Rongoa Maori has been marginalised in legislation, in universities, and in medical schools, and excluded from pharmacy prescriptions. Meanwhile, pharmaceutical companies are currently making a global search for plant extracts which have medicinal properties. Knowledge of these properties derives from the techniques of herbal medicine practised in each locality where the plants are indigenous, and not from the discipline of conventional medicine.

The New Zealand Government funds and recognises conventional medical practice, but it does not fund and recognise herbal medical practice. This has brought about a situation where New Zealand statutes permit private commercial companies to patent and market a plant product because they have made a chemical analysis of its constituents and produced a product which is technologically measurable. Thus, legitimation of the product's healing qualities is derived from its proven use in folk medicine, while Rongoa Maori, its practice, and its preparations, has not received legitimation from the New Zealand Government.

This contradiction in New Zealand Government legislation can be demonstrated with a product called 'Zinax', released in 1996. 'Zinax' is marketed by the transnational pharmaceutical company Bionax, and contains a patented ginger extract HMP-33. Bionax advertisements state:

> Dried ginger has been prescribed for more than two millennia by the Chinese for the relief of a number of conditions associated with pain and inflammation . . . With Zinax you are assured of a potent but stable ginger product, where the active ingredients in the ginger remain in their natural form yet are concentrated so as to be far more effective . . . one capsule of Zinax contains the equivalent of approximately 6600mg of dried ginger . . . Morten Wiedner, who made the scientific breakthrough . . . has centred on ethnopharmacology, offering medical treatment from plants. He has sourced ancient medical texts from throughout the world to find the herbal remedies of our ancestors, and used the information to make it more potent. The core of his work has been a new method of extraction that strengthens and standardises the amount of herbal extract in each tablet. His work is said to herald a new way in alternative health care, which combines the best ancient knowledge with today's technology. Zinax is just one of many revolutionary products expected to be produced by this leading biochemist in coming years. He says the new health care is called 'high technology herbal medicine'.[169]

Substances used effectively and safely in herbal medicine for many generations are moved across into the practice of pharmaceutical medicine where they receive legitimation through short-term chemical analysis:

> The discovery of the active principals of ginger have made possible pharmacological investigations of the effects and mechanisms of the action. In several experiments the active ingredients of ginger were found to inhibit the enzymes of arachidonic acid metabolism. The phenolic ketones of ginger are powerful inhibitors of cyclooxygenase and 5-lipoxygenase, being dual inhibitors of arachidonic acid metabolism . . .[170]

169. *New Zealand Herald*, 10 October 1996, p E5

'Zinax' obtains its legitimation from folk medicine, while the pharaceutical company discredits the techniques used by herbal practitioners:

> One of the main problems with herbal medicine previously was that the amount of herbal extract in each tablet or capsule was not standardised . . . [The chemist's] extraction of the healing properties of ginger eliminates a compound called shogaoles, the part of the plant that can irritate the stomach . . . What we are seeing at the present time in Europe is a lot of the big pharmaceutical companies entering into this natural health market; they know it is the way of the future . . . Through selective cultivation, careful handling, and the extraction method, the vagaries of nature are eliminated in Zinax to produce a 100 per cent uniform ginger dosage of active compounds.[171]

Plant properties can be healing or detrimental to human well-being according to dosage. Toxic alkaloids such as morphine and strychnine are poisons extracted from plants and used internationally in conventional medical practice. Maori herbal practitioners are alike managers of purity, safety, consistency, and effectiveness. Their practice is undermined by the failure of the statutes to accord their monitoring techniques equal validity.

The New Zealand Government Centre for Adverse Reactions Monitoring (CARM) in Dunedin is publicly hostile to herbal medicine:

> Dr Pillans [Peter Pillans, Director of CARM] says it is very important for the public to realise that unlike medicines, the purity, safety, consistency and effectiveness of herbal products are largely unchecked. He says consumers should be satisfied that the potential benefits outweigh any risks . . .[172]

4.7 A NEW BIOTA

Maori traditional healers do not wish to lose the undiluted life-forms existing at 1840.[173] From this perspective, the inventory of indigenous flora and fauna is a taonga; it is a pharmacopoeia of known properties which heal.

Many New Zealand scientists believe that an accommodation between indigenous and introduced species is a natural process which is taking place and cannot be stopped: 'We can't preserve the environment as it is. This concept hasn't got across yet'.[174] Scientists who have recognised this, have adopted a strategy of slowing down the process, and husbanding it.

Within wild forests, hybridisation takes place occasionally and slowly. Because the medicinal properties of indigenous flora and fauna are known through long-term observation, Maori practice is undermined by rapid change in these properties,

170. Ibid
171. Ibid
172. *New Zealand Herald*, 10 October 1996, p E3
173. University of Waikato, Rongoa Maori workshop, Waitaia Lodge, 1996
174. The Parliamentary Commissioner for the Environment, Helen Hughes, in *Rural News*, 7 October 1996, p 16

and by sudden introductions of genetically altered species which bear no outward mark of their altered properties. Mis-identification is seriously harmful to the discipline.

Currently nurserymen are hybridising indigenous flora to create plant varieties with commercial appeal, for example a 'Wiri' hebe with new flower colours. Hybridised hebes spread into the wild and alter wild hebes, just as pohutukawa introduced from the Kermadec Islands are cross-pollinating with mainland pohutukawa; after the twentieth century the annual mass flowering of deep red pohutukawa will become unknown. In this process, the wild plant-forms lose and gain properties. Maori practice has techniques for discovering new properties, but the process is slow. The commercial interests of nurserymen are antithetical to the interests of Maori healers.

The release of genetically altered indigenous plant-forms is also antithetical to Maori interests where the genetically altered forms have the ability to cross breed with wild forms, and where the genetically altered forms cannot be distinguished from wild forms.

Actions which are not natural processes, but are the choices of human society, are subject to public discussion, public policy, parliamentary debate, and legislation. Maori traditional healers have interests in writing and passing of statutes regarding: hybridisation of indigenous life-forms; genetic alteration of indigenous life-forms; introductions of life-forms for biological control which may compete, endanger, or disease indigenous life-forms; introductions of genetically altered life-forms which may hybridise with indigenous wild forms; commercial marketing of plant extracts; intellectual property rights in plant extracts; and writing and signing of international conventions. Exclusion of Maori from these decisions during the 1980s and 1990s has been documented by McNeill.

In summary, continuing interest in indigenous flora and fauna by Maori traditional healers implies research and development to meet rapidly changing conditions; changes to statutes; scientific recognition of Maori classification of life-forms; medical diplomas or degrees in Rongoa Maori; and a funded national foundation to ensure continuity of practice.

CHAPTER 5

FAUNA OF RIVER SYSTEMS

5.1 Treaty Fisheries

To many Pakeha settlers the inland waterways were inscrutable. In 1861 Hursthouse described New Zealand rivers as 'destitute of fish'.[1] In 1892 Spackman maintained that before the introduction of trout 'every one of the thousand creeks and streams ... were tenantless and profitless to the sportsman'.[2] In 1910 a fisheries inspector with the Marine Department declared there were 'no fish of any value' to the early colonists. It was this scientist who established quinnat salmon in New Zealand waters, a predatory fish which has displaced indigenous fauna.[3] In 1990 McDowall described freshwater fish as the 'Cinderella' of research,[4] and to date the life-cycle histories of most species remain a mystery to fisheries scientists.

To Maori, river systems were passageways for mile-long shoals of eels, lampreys, smelt, and inanga migrating in and out of the sea. At the signing of the Treaty in 1840 massive eel and lamprey weirs stood along the banks of rivers, at the outlets of lakes and swamps, at the conjunctions of side streams and seabound waterways. Stone weirs and side channels diverted grayling, koaro, and smelt. Traps and baskets held eels, lampreys, kokopu, koaro. Eels dried on racks, smelt and whitebait dried on rock pavements. Lake koaro were bartered to coastal tribes. The fisheries accorded to Maori in the Treaty were an economic industry.

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1. C Hursthouse, *The New Zealand Handbook. A Complete Guide to the Britain of the South*, London, Stanford, 1871. The chapters on fisheries follow the extensive search of sources by a fisheries scientist currently at NIWA, R M McDowall. The natural history source throughout this chapter is R M McDowall, *New Zealand Freshwater Fishes. A Natural History and Guide*, Auckland, Heinemann Reed and MAF Publishing, 1990.

   In 1840, 27 indigenous fish spp inhabited estuaries, rivers, lakes, and swamps: 1 lamprey sp, 2 eel spp, 2 smelt spp, 13 galaxiids: 5 whitebait spp, 3 mudfish spp, 5 other galaxiids; 6 bully spp, 1 sandperch sp, 1 flounder sp. Another six spp of marine fish enter river estuaries: 1 kahawai sp, 2 mullet spp, 1 stargazer sp, 1 cockabully sp, 1 flounder sp. In 1990, 20 introduced species competed with the native fauna for food and habitat: 7 trout and salmon spp, 1 catfish sp, 7 carp and minnow spp, 4 live-bearer spp, 1 perch sp.
2. H H Spackman, *Trout in New Zealand. Where To Go and How to Catch Them*, Wellington, Government Printer, 1892
3. L F Ayson, 'Introduction of American Fishes into New Zealand', in *Bulletin of the Bureau of Fisheries*, vol 28, 1910, pp 969–975
4. McDowall, *Natural History*, p 7

5.2 Perceptions of the Fauna

New Zealand freshwater fish are cryptic, that is, they are secretive and wary, they blend with their habitat and retreat into hiding. Patterns on koaro (mountain trout) replicate the ripples and reflections of light on the surface of forest streams. Banded kokopu move rapidly to cover when disturbed. Young piharau (lamprey) can quickly bury themselves in the mud. Papanoko (torrentfish) lie on the stream bed hidden under white water in the rapids where they feed.

Many native fish move to new habitats as they grow, and their appearance and lifestyle change apace.[5] Taiwharu (giant kokopu) come in from the sea as small, unpigmented whitebait. As they move into lowland swamps and creeks they become greenish-grey juveniles with vertical bands on their sides. Adults are nocturnal, lurking under overhanging banks and feeding at night; they are dark grey, spangled with gold spots and hieroglyphic markings that mirror moonlight.

Glass longfin eels enter estuaries and settle in the mud or sand. As they grow to a dull sandy brown they move further upstream, living amongst the gravels of rapids and feeding on insect larvae. As they get larger they become nocturnal, hiding beneath logs and overhanging banks, feeding on small fish, brown on the back and creamy-yellow on the belly.

Piharau who have lived as grey-brown juveniles in mud burrows, metamorphose before migrating down to the sea, changing to a brilliant silver and blue which will blend with their marine habitat. The freshwater fish are a fauna of dissemblance and changing appearances.

Sometimes the same fish has different forms in different parts of the country. Whitebait from the West Coast (South Island) are fatter and longer than elsewhere.[6] The common river galaxias is a plain olive-brown in the milky, snow-fed rivers of Canterbury, but strikingly banded in the clear streams of Central Otago.[7] Charles Douglas, exploring in the 1860s, observed that the koaro 'changes its colour according to the waters it frequents. In bog holes and dark bush creeks it is . . . black, . . . in the large rivers and clear streams exposed to sunlight, it is very light coloured and in a snow river, I have caught them within twenty chain of the mouth of a glacier, almost white'.[8]

Some freshwater fish change appearance instantly. Redfinned bullies become darker when the light above the stream weakens and when the stream bed darkens. When the cockabully is frightened it pales and blends with its background; when agressive it darkens and becomes conspicuous. Male bullies develop a black nuptial colouring during spawning. In addition, male and female bullies have different colouration. Fisheries scientists did not establish that there are six species of bullies until the 1940s and the present scientific names were not settled until 1975.[9]

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5. Fish species are polymorphic, different habitats leading to the development of markedly different ecotypes.
6. R M McDowall, *The New Zealand Whitebait Book*, Wellington, Reed, 1984, p 157
7. McDowall, *Natural History*, pp 114–115
8. McDowall, *The Whitebait Book*, p 96
9. McDowall, *Natural History*, pp 293, 297, 311, 321

From the 1860s on, New Zealand fisheries scientists determined species on the basis of morphology, and were often defeated. Nineteenth century scientists misidentified large, old smelt as a separate species from their younger stages.[10] Marine-hued lampreys undertaking a seaward migration are so distinct from mud-dwelling lampreys that 'it was long thought there were two lampreys in New Zealand'.[11] Common smelt spawn at different times in different locations; in the 1940s Gerald Stockell, a fisheries inspector, treated smelt from different lakes as different species.[12] Within the whitebait catch, distinguishing the migrating juveniles from each other requires tuition from skilled observers, considerable experience, and attention to small, often highly subjective details; most Pakeha scientists still cannot make reliable distinctions between juveniles of koaro and shortjawed kokopu.[13] Altogether the five whitebait species – inanga, koaro, giant kokopu, shortjawed kokopu, banded kokopu – were given 20 scientific names.[14]

A morphological approach to classification has perplexed fisheries scientists, created confusion in naming, delayed attention being given to habitat protection, provided unreliable definitions for Maori names of freshwater fish, and sustained the Crown's unsupportable conviction that it was displacing Maori names with finer distinctions.

5.3 Life-cycle Classification

Because most native fish spend part of their life cycle in the ocean, New Zealand rivers are pathways of fish migrating up and down stream.[15] Many migrations occur when there is a conjunction of lunar phase, river floods, spring tides, and black nights. The dark of the moon provides cover; floods and high tides enable fish to cross bars, to reach spawning grounds on river banks, to make a fast passage, and to escape detection in the swirl of water. Maori correlated the multiple identities of each species and stored this knowledge in a sequence of names, producing a complex knowledge of life cycles. As at 1840, Maori names of fish had been

10. McDowall, *Natural History*, citing identifications made by Hector in 1871.
11. W Martin, *The Fauna of New Zealand*, Whitcombe and Tombs, [1929] p 171
12. McDowall, *Natural History*, p 69
13. R M McDowall, *Conservation and Management of the Whitebait Fishery*, Wellington, Department of Conservation, Science & Research series, no 38, 1991, p 3
14. McDowall, *Whitebait Book*, p 82
15. Seventeen native fish move to and from the sea during their life cycles (they are diadromous): lampreys, eels, smelts, the torrentfish, the black flounder, the extinct grayling, some galaxiids, and some bullies. Others survive in land-locked swamps and lakes: some bullies, some galaxiids, and the mudfishes. Some spend much of their lives travelling long distances upstream and downstream. What is known about papanoko (torrentfish, *Cheimarrichthys fosteri*) suggests these fish are highly migratory at all stages. During spring and autumn, juveniles make their way from the sea into river estuaries. Adult males remain in the lowest reaches of rivers and streams, about 2 kilometres from the sea. Females however penetrate further inland and inhabit higher elevations, 24–50 kilometres from the sea. From late spring to autumn mature adults move downstream to spawn. In winter they return upstream, while their larvae are presumably washed out to sea (McDowall, *Natural History*, pp 286–291).

stabilised, and local variations on a general theory of migration cycles formed a complex body of knowledge.

Maori are scientists of lunar periodicity.[16] During the spring, glass eels migrate into New Zealand rivers in countless thousands. In some rivers, greatest runs are reported during September, for a few days after each full and new moon.[17] In the Waikato River, upstream migrations of elvers are greatest a little after the new moon, when lunar illumination is at a minimum.

Migrations of elvers are mostly during the night; in some rivers migration commences after sunset, peaks between 9 and 11pm, and dwindles after midnight; when very large numbers are migrating some movement may continue, especially at dawn and dusk.[18]

Lamprey larvae migrate downstream and out to sea in spring (July–August); in the Waikato river migration occurs during the early hours of the night. After some years at sea mature lampreys migrate back into rivers during winter and spring. Migrations occur on the dark phase of the moon, at night, and are greatest when rivers are in flood.[19]

Upstream, beyond the reach of the salt tide, autumn shoals of inanga migrate down to estuaries to spawn. These migrations coincide with the full and new moons, and thereby with the high spring tides downstream, that will lift the fish onto estuary banks to spawn amongst grasses and rushes. Spawning occurs at full tide and after the highest of the spring tides, so that the eggs are not again covered by water until the next cycle of spring tides.[20]

Maori observations are ordered by a theory of the correspondences between lunar cycles and fish life-cycles. The level of salient perception is the location of each fish in its round-trip between sea and freshwater: Maori names mark those points where simultaneous changes in habitat, appearance, and habits bring about an identity crisis. Mudfish (currently identified as three *Neochanna* spp) remain all their lives in their patch of swamp, retreating into mud caves during drought; in Maori naming they remain waikaka, water-cunning, all their lives. Whitebait (*Galaxias maculata*) however, enter streams from the sea in spring as unpigmented juveniles named karawaka; adults live solitarily in the upper reaches and then migrate back downstream to spawn as inanga.[21] The early run of inanga migrating

16. The theory of lunar periodicity is accepted by marine biologists as an outstanding contribution by Pacific fishermen to world knowledge (R E Johannes, *Words of the Lagoon: Fishing and Marine Lore in the Palau District of Micronesia*, Berkeley, University of California Press [1981]). In the tropical Pacific, correlations between lunar phases, tides, and shifts in the wind are less often disturbed by other factors and are more directly observable; comparative studies suggest Maori adapted a well-defined theory of lunar periodicity to New Zealand conditions.
17. P Dinamani and R W Hickman, *Proceedings of the Aquaculture Conference*, Fisheries Research Division, Occasional Publication, no 27, Wellington, New Zealand Ministry of Agriculture and Fisheries, 1980, p 66
18. D J Jellyman and C M Ryan, 'Seasonal Migration of Elvers (*Anguilla* spp) into Lake Pounui, New Zealand, 1974–1978' in *New Zealand Journal of Marine and Freshwater Research*, vol 17, no 1, 1983, pp 1–15
19. I C Potter, R W Hilliard, F J Neira, 'The Biology of Australian Lampreys', in P De Dekker and W D Williams (eds), 'Limnology in Australia', *Monographiae Biologicae*, vol 64, 1986, pp 207–230
20. McDowall, *Natural History*, p 122

downstream to spawn in the autumn is pukoareare; the major migration is matuaiwi.[22]

5.4 FISHING TECHNOLOGY

Maori interests in freshwater fish are interests in a harvesting resource. Maori trap fish at stages in the life cycle when they are nutritious, being rich with roe, and at stages in the lunar cycle when they are abundant, congregating to migrate.

Large shoals of fish, congregating to migrate, funnel through the narrow entrances of estuaries and river mouths. Fast-moving shoals of smelt migrate in as adults; shoals of glass eels, bullies, and whitebait migrate in as juveniles. Eels migrating downstream to spawn at sea are trapped as they congregate at lake outlets. Eels and lampreys migrating upstream are trapped as they pass through weirs or congregate at the base of falls. Migrating shoals often move along the banks where the current is less swift and this habit is exploited in the placement of weirs and diversion channels. The scientific and technological achievement of Maori fisheries is subtle: knowledge of fish movements is combined with human stealth to outwit the fish. The techniques of weirs, diversion channels, and traps leave the habitat undamaged and the uncaptured fish unfrightened.[23]

Young fish migrate into swamps and upstream forks, where they fan out into side streams. Here each fish establishes a solitary territory, often in places rarely traversed by humans: alpine reaches of streams, forested mountainsides, and peat swamps. Many adult fish are nocturnal, wily, and secretive, they retreat rapidly when disturbed, and are difficult to catch. Maori do some fishing for solitary fish in places where they abound, using a heritage of closely observed knowledge.

Lampreys and eels migrate up rivers during the night; koura usually hide during the day in crevices and shallow burrows and become active at night; kokopu also feed at night. Thus Maori trapping of freshwater fish is often nocturnal. W J Phillips described the collectivity of skills employed in outwitting kokopu:

> Mostly they were caught by the women at night with basket-like nets made of supplejack known as kupenga . . . it being useless to try to catch the wily kokopu with them in daylight. They made torches of resinous mapora wood[24] . . . The women waded upstream, the fish come out of hiding at night to be in midstream and the fisherwoman moves carefully until close by and then quietly lowers her net and moves it close to the shoal. She then advances her left foot and gently touches the fish on the near side. The startled fish invariably darts off in the opposite direction and hence enters the net which is raised out of the water.[25]

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21. Matua-a-iwi; inanga, post spawners (Ngai Tahu) (R R Strickland, *Nga Tini a Tangaroa. A Maori–English, English–Maori Dictionary of Fish Names*, New Zealand Fisheries, Occasional Publication, no 5, Wellington, 1990).
22. E Best, *Fishing Methods and Devices of the Maori*, Wellington, Government Printer, 1929, pp 109–210
23. By contrast, Whitianga fishermen report that trawling for scallops damages the ground-living organisms on which fish feed, and leaves the ocean bed looking like a ploughed paddock.
24. Mapara, ngapara, kapara (*Podocarpus excelsum*, kahikatea)

The nocturnal habits of fish are exploited ingeniously. Bundles of fern are submerged and left to rest on lake and stream beds. Kokopu, koaro, piharau, or koura retreat into these 'safe houses' during the day, and are lifted out in the fern mat (whakarau). Engineering that appears elementary combines knowledge of fish habits with knowledge of physical forces: lampreys migrating upstream against the current encounter weirs (utu piharau, kanakana) with avenues of escape. Traps are placed downstream of the gaps, using the enhanced force of water flow to sweep the lampreys into the traps.[26] This is a hand-made, social group technology that employs subtle combinations of knowledge; and it does not plunder the resource, leaving an avenue of escape for the wiliest of the fauna.

At 1840 Maori harvested seasonal abundance, and had an inventory of names identifying the progress of each fish through its migratory cycle. Life cycle research has not been a Crown priority, even when ecological concerns became critical. In 1990 McDowall wrote of the papanoko: 'The location of the spawning site, spawning behaviour . . . are completely unknown . . . What happens after spawning is also unknown'.[27] Of the shortjawed kokopu: 'Because the shortjawed kokopu has not been encountered very frequently, there is still some doubt about where this species 'typically' lives . . . [it has] secretive habits . . . all the kokopu species were thoroughly confused by the earlier writers'.[28] In 1991 he wrote of the banded kokopu that 'virtually nothing' is known of spawning behaviour and choice of spawning sites, while 'absolutely nothing' is known about the life of banded kokopu at sea; 'even less' is known of the natural history of the giant kokopu; and 'little' is known about the koaro. The natural history of the shortjawed kokopu is 'virtually undescribed'.[29]

New Zealand's freshwater fish fauna was not understood by fisheries scientists until the 1940s, and it was not until the 1960s that scientific names for the inventory of 27 species had been stabilised. Thus, Maori knowledge has been recorded by researchers who could not adequately translate what they were told. McDowell noted that Elsdon Best and Te Rangi Hiroa wrote extensively about Maori capture and use of freshwater fish, but knew very little about the fish themselves.

McDowall attributes the neglect of Maori knowledge to there being no time overlap of knowledgeable scientists with knowledgable Maori.[30] But in fact fisheries scientists do currently overlap with knowledgable elders. Another explanation is offered.

The theoretical basis of Crown fisheries research is a theory of philogenetic evolution. Here, the level of perceptual salience has been species distinctions. Possibly because determination of species (systematics) is the basis of conventional international science, and that is where fisheries scientists have secured their

25. W J Phillips, *The Fishes of New Zealand*, New Plymouth, Avery, 1940
26. McDowall, *Natural History*, pp 409–410
27. McDowall, *Natural History*, p 291
28. McDowall, *Natural History*, pp 101–102
29. McDowall, *Conservation and Management of the Whitebait Fishery*, pp 16–18
30. McDowall, *The Whitebait Book*, p 84

professional reputation. No attempt has been made to find what theory underpins Maori naming where the level of perceptual salience is life cycle transformations.

Maori classification is neither evolutionary nor species specific, and biological scientists do not have adequate tools for investigating a knowledge base that is much more complex in its observations and organised by a different theory. Lacking appreciation, they have treated hapu knowledge of the fauna with scepticism, or ignored it. In 1990 McDowall wrote of the shortjawed kokopu, a species taken by Maori in the whitebait catch: 'There is no evidence that the Maori were familiar with this fish'.[31]

Thus, in 1996, Maori knowledge had not been systematically investigated. Maori priorities had not set the agenda for freshwater fisheries research, and no institute of freshwater fisheries research had employed Maori to conduct research to develop their own knowledge base. 'Who knows what it all means?' McDowall asked in 1990. 'There is now, seemingly, no way of finding out.'[32] However, Maori naming does have systematic meaning, and there are ways of finding out.[33]

5.5 River-based Knowledge

Each New Zealand river has a unique character, a unique inventory of fish fauna, and a unique Maori fishing culture. Rivers which drain large areas of lowland swamp were formerly rich in fish: Manawatu, Waikato, Waihou. Rivers which drain the sandstone/papa landscapes from Hawke's Bay to Cape Palliser are almost barren of fish. The Whangaehu is frequently contaminated by volcanic acids and has a sparse fish fauna. The five whitebait species enter different qualities of water: Giant kokopu inhabit coastal swamps close to the sea; banded kokopu enter brown, tannin-stained waters – Jackson Bay Stream has large numbers of banded kokopu. Koaro enter clear-flowing, rocky streams and penetrate far inland – the snow-fed Haast and Arawata Rivers have large numbers of koaro. Whitebait entering the warm, brown waters of the Waita River are nearly all inanga.[34]

Usually no more than five native fish species are found in one locality, and often there are only one or two species in a stream. As a consequence of all these factors, hapu interests in freshwater fish are different in each locality, and each hapu has its own property of knowledge, technology, and harvested resources.

In each river system, fish are moving up and down in accordance with their separate life cycles. In autumn, while inanga are migrating downstream to spawn on

31. The shortjawed kokopu was named 'banded trout' by Westland colonists; it was described as a separate species in 1899, was not seen again by scientists until ca 1939, nor again until 1960 (McDowall, *Natural History*, pp 100–104). Since the 1860s biologists have regarded evolutionary theory as more accurate than other classifications, but each theory has a different objective: international biologists are reconstructing a history of descent with change (philogenetic evolution) while Maori are correlating lunar and life cycles (lunar periodicity).
32. McDowall, *The Whitebait Book*, p 86
33. For example, combining archival research with the knowledge of contemporary elders, and comparing Maori records with related Austronesian languages.
34. McDowall, *The Whitebait Book*, pp 54, 55, 92, 119–28

estuarine sedges, smelts are migrating upstream to spawn on river sandbanks. Lampreys migrate in from the sea and upstream to spawn while eels migrate downstream and out to sea to spawn. Most inanga spawn and die in an annual cycle, while koaro and kokopu survive spawning and return upstream; banded kokopu live for possibly nine years.[35] In northern New Zealand eel fishing can go on virtually all year round but moving south, cold winter temperatures reduce eel activity and induce some hibernation.[36]

Thus, knowledge of fish movements is particular to each river system and to each hapu. Further, tribes have dialect differences, particularly in naming flora and fauna. Many circumstances have combined to produce a system of classification and naming amongst Maori which is complex and finely observed. Maori knowledge appears in Pakeha records as apparently disordered because no systematic account is taken of dialect differences, of the organising theory, and of the unique ecology of each river system.

5.6 MAORI NAMING OF THE FAUNA

Sometimes Maori names correspond with a scientifically defined species: papanoko is precisely the torrentfish, *Cheimarrichthys fosteri*. Sometimes Maori classification recognises wider groupings: toitoi has been recorded for *Gobiomorphus cotidianus*, common bully, *Gobiomorphus gobioides*, giant bully, and *Gobiomporhus huttoni*, redfinned bully;[37] possibly toitoi classes together all six native bullies. Juveniles may be classed together and distinguished at later stages: karawaka, in Ngati Whatua usage, are the juvenile fish of a number of galaxias species which migrate in together; as they move upstream and become adult they are distinguished by different individual names: inanga, koaro, kokopu. Some fish have both a common name and a reverential name: the torrentfish, commonly called papanoko, is named metaphorically te ika huna a Tane, the hidden fish of Tane.[38] Maori names are storehouses of natural history observation, with an organising theory that documents life cycle changes.

In 1990, Strickland published a dictionary of Maori names of freshwater fish, compiled from historical records. Some fish have a large number of names, but often the dialect origin, the local provenance, and the life-cycle stage are not recorded: *Galaxias brevipinnis* is named koaro at lakes of the central North Island Volcanic Plateau (Lake Taupo, Lake Rotoaira), and maehe at Lake Waikaremoana.

35. Some fish have multiple spawning seasons. Bluegilled bullies spawn some in spring, some in autumn. Common bullies in a Northland lake spawn some in February–March, some in July–August, some in November–December. The same species may spawn at different times in different locations: common smelt spawn in summer at Lake Ngapouri, but in winter at nearby Lake Okaro (McDowall, *Natural History*, pp 307, 313).
36. McDowall, *Natural History*, pp 16, 73, 427
37. Strickland, *Nga Tini a Tangaroa*
38. McDowall, *Natural History*, pp 286, 289. Papanoko, *Cheimarrichthys fosteri*, feed at the base of boulders where their fins act as depressors, so that the current flowing overhead anchors the fish on the bottom, where the velocity of the water is less fierce. Patterns on the body replicate breaking water.

Elsewhere, historical records have ascribed the names hiwihiwi (Ngai Tahu), kakawai, kowaro, maeha, miroiti, mohimohi (Te Arawa), ngohongoho (Te Arawa), pangare, raawai, raumahehe (Tuhoe), taiwharu, and tohitohi to this fish.[39] The dictionary is invaluable to researchers, but such a list of names does not convey the coherent body of knowledge with which Maori harvested a prolific resource in 1840.

As colonial naturalists renamed the freshwater fauna, and as fisheries scientists organised the names into phylogentic species, Maori names were displaced. By international rules for naming species,[40] a holotype must be formally described, and the description published and circulated. Under these rules, the oldest name takes precedence. Fisheries scientists did not give precedence to Maori names, as two examples will demonstrate.

At 1840 the torrentfish was named in different localities papanoko (Tuhoe), papangoko, papamoko, panoko, panokoreia, panonoko, panokonoko, mokomoko, papane, panepane, papauma, papaki, papakiuma, papapakiuma, parikoi, parikou, pariri, parihou, piripiri, powhatu, piripiri pohatu, and so on.[41] In 1874 the torrentfish was given a latin name, *Cheimarrichthys fosteri*. 'The specific name honours a Mrs Foster who first collected the fish from the Otira river'.[42] At 1840 the redfinned bully was named titarakura, and so on.[43] In 1894 this bully was given a latin name, *Gobiomorphus huttoni*, honouring Sir Frederick W Hutton, director of the Canterbury Museum.[44]

After the 1960s, when scientific knowledge of the fauna had been more or less stabilised, the now fragmented Maori knowledge of a depleted fauna could have been re-empowered with research. In 1980 the Fisheries Research Division published *A Synoptic Check-list of the Freshwater Fishes of New Zealand*. The list was based on '15 years' intensive collecting by staff of the Fisheries Research Division and others'.[45] Maori names were omitted; no research allocation had been given to identification and systematisation of Maori names. Maori knowledge had been sidelined.

5.7 Commission: Laws and Administrative Processes Affecting Maori Interests in Flora and Fauna

From 1846 the Crown encouraged introductions of new species with the 'Duties of Customs Ordinance, 1846' which removed duties on selected species. The Colonial

39. McDowall, *Natural History,* p 415; Strickland, *Nga Tini a Tangaroa*. Common English names for koaro are mountain trout, climbing galaxias, and Matukituki whitebait.
40. The International Code of Zoological Nomenclature.
41. Strickland, *Nga Tini a Tangaroa*
42. McDowall, *Natural History*, p 289
43. Strickland, *Nga Tini a Tangaroa*
44. McDowall, *Natural History*, p 299
45. R M McDowall, *A Synoptic Check-list of the Freshwater Fishes of New Zealand*, Fisheries Research Division, 1980, p 5

Office in London was already familiar with the potential of introduced species to cause harm;[46] none the less, new introductions to New Zealand proceeded without research into their effects on the indigenous species which provided Maori with a self-sustaining economy.[47] An opinion published in 1872 stated, 'The native species . . . are rapidly giving way . . . Not that the change is to be regretted, except from a zoological point of view'.[48]

From 1867 on, introduced game fish took precedence over indigenous fish in Crown management of waterways.[49] Trout were protected by closed seasons from 1867 and angling licences from 1892.[50] From 1896 Whitebait Regulations restricted harvesting of whitebait; otherwise indigenous freshwater fish were not protected by statute until 1983.[51] Through statutes, the Crown secured the colonisation of waterways with salmonid fish.

From 1840 to 1867 Pakeha settlers hunted indigenous birds and fish without statutory constraint. From 1867 to 1996 the Crown imposed closed seasons on the taking of scheduled indigenous game.[52] The schedules failed to protect many species in which Maori had economic and social interests, as the two examples demonstrate.

At 1840 hapu located around Central Plateau lakes maintained commercial and economic interests in koaro fisheries. From around 1880 on, acclimatisation societies and the Department of Internal Affairs stocked the Rotorua–Taupo lakes with brown and rainbow trout. In 1897, Rotorua Maori advised the Rotorua Town Board that trout had depleted their indigenous koaro fishery. As the koaro populations declined, the Rotorua–Taupo lakes were re-stocked with indigenous common smelt to support the trout fishery. During the 1930s smelt became

46. 'By the end of the seventeenth century the spread of goats in the wake of European expansion was creating ecological difficulties on a global scale.' See, for example, reports by Governors Roberts, Byfield, and Brooke on St Helena during the eighteenth century (R H Grove, *Green Imperialism*, Cambridge University Press, 1995, p 108).
47. In 1873 Hutton warned that indigenous fish would have no defence against predatory introduced fish (F W Hutton, 'On the Geographical Relations of the New Zealand Fauna', in *Transactions and Proceedings of the New Zealand Institute*, vol 5, pp 227–256). In 1941 Stockell warned that fishery control was 'blindfold' (G Stockell, *Wild Life Control*, Wellington, Blundell). In 1990 McDowall conceded that there had been 'only minimal explicit study of the relationship between indigenous and exotic fish faunas' (McDowall, *Natural History*, p 461).
48. Cited in R M McDowall, *Gamekeepers for the Nation*, Christchurch, Canterbury University Press, 1994, p 36. In 1990 the impact of introduced fish on indigenous fish and their food resources remained still largely unknown and unresearched (McDowall, *Natural History*, p 461).
49. The Resource Management Act 1991 required water quality in streams to be adequate for trout; no provision has ever been made for water qualities required by indigenous fish.
50. The price of an angling licence was recorded around 1900 as 10s for a single river and 20s for a 'roving' licence, beyond the budget of many Maori families. McDowall notes that acclimatisation society records show they were selling angling licences from the 1860s, although the 1867 Salmon and Trout Act does not mention licences. Under the Animals Protection Act 1866 a licence to hunt game and native game cost £5 (five pounds), a price beyond the budget of most Maori families. Under the Animals Protection Act 1867 a person under the age of 15 who hunted game or native game without a licence could be whipped (McDowall, *Gamekeepers for the Nation,* pp 56, 65, 67).
51. Freshwater Fisheries Regulations, 1983
52. Closed season for native pigeon from 1896. Closed season for pigeon, pukeko, kaka from 1901. Closed season for whitebait from 1896.

established in place of the koaro, foreclosing on the possibility of the koaro fishery being recovered.[53] Thereafter, introduced salmonid fish dominated the Central Plateau lakes.

Eels are the fish most prized by Maori in their freshwater fisheries. At 1840 New Zealand waterways still retained stocks of very large longfin eels. From 1866 some indigenous fauna (hawks, shags, eels, and so on) were classed by statutory bodies as vermin. By 1900 acclimatisation societies were promoting public vermin extermination campaigns to eradicate eels from waterways occupied by trout. These campaigns continued until around 1977. Large eels were particularly targeted. Since 1975 commercial fisheries records have shown a continual decline in numbers and size of eel captures.[54]

5.7.1 The Fisheries Conservation Act 1884

This Act did not recognise any Maori interests in the fauna. The Act prescribed regulations for the harvesting and selling of oysters, seals, and specified fish. These regulations could be altered by the Governor in Council. Hereafter the Crown, not Maori, exercised authority over the fauna.

This Act prohibited 'the casting of sawdust or any saw-mill refuse into any waters, river, or stream' (section 5(12)). This was ammended in 1903 to allow the Governor to make regulations 'Preventing the pollution of streams in which trout or salmon exist'. Depositing mining tailings in streams was not held to be pollution under this Act (section 3 of the Fisheries Conservation Act Amendment 1903, No 5). The habitats of indigenous fish were given no protection from pollution by flax mills, saw mills, farm effluent, and toxins.

5.7.2 The Whitebait Fisheries Regulations 1894, 1896

In 1887 commercial canning of whitebait began. From 1894 certain techniques of whitebait trapping favoured by Maori were outlawed: construction of weirs (groynes) across the current, and construction of diversion channels in stream banks. From 1896 a closed season was imposed.

5.7.3 The Fisheries Act 1908

Under this Act the Governor-General could declare any species of fish protected, and could set apart bays where fish propagated, within or outside any harbour (section 10). Management of freshwater fisheries was accorded to acclimatisation societies, and in their absence to the Department of Internal Affairs. It is acknowledged that freshwater fish did not receive protection under their management.[55]

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53. McDowall, *Natural History*, p 113
54. McDowall, *Gamekeepers for the Nation*, p 124
55. Fisheries scientists at the National Institute of Water and Atmosphere, personal communication, 1996

The Act declared: 'Every person . . . who wilfully destroys or causes to be destroyed any fresh fish fit for human consumption is liable to a fine . . .' (section 54). None the less, acclimatisation societies continued to destroy and bury hundreds of thousands of eels in public campaigns.[56]

The Arawa Maori Council (from 1955 the Arawa Maori Trust Board) received entitlement to 20 angling licences at 5 shillings each. A holder was entitled to fish for trout within the Arawa Maori District, 'for the use and consumption of himself and the members of his family, and for no other purpose whatsoever' (section 2).

5.7.4 The Wildlife Act 1953

The Act declared '. . . all wildlife is hereby declared to be . . . absolutely protected throughout New Zealand' (section 3, Part 1, Protection of Wildlife). It was an offence to hunt protected wildlife (section 63). Acclimatisation societies continued to notify their memberships of extermination campaigns against eels, and Government departments participated in some campaigns.[57] It is acknowledged that 'wildlife' in the 1953 Act did not include freshwater fish. Acclimatisation societies voluntarily ceased their extermination campaigns against eels around 1977.

5.7.5 The Conservation Act 1987

This was the earliest legislation requiring Maori values in flora and fauna to be recognised. The Department of Conservation was established, and took over responsibility for conservation of native freshwater fish and for managing freshwater fisheries.

5.7.6 The Fisheries Act 1983

Taking acclimatised fish without a licence was prohibited (section 68). Pollution of fresh waters, estuaries, and spawning grounds was unlawful (section 75). The Governor-General could require and authorise 'the provision of devices and facilities to permit or control the passage of fish through or around any dam or other structure impeding the natural movement of fish upstream or downstream' (section 90(f)).

Freshwater fisheries regulations included: eels, whitebait, and indigenous fish could be taken for human consumption. Sale of koura was unlawful (Part 10, section 71). Freshwater fish were protected: 'No person shall in any water intentionally kill or destroy indigenous fish' (Part 10, section 70), and 'No person, having taken indigenous fish from any water, shall leave the fish upon the bank . . .' (Part 10, section 70).

The regulations provided for the unhindered passage of freshwater fish along inland waterways (Part 6, Fish Passage).

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56. McDowall, *Gamekeepers for the Nation*, p 121
57. Ibid, p 120

The Fisheries Act 1983 gave acclimatisation societies responsibility for protection and management of freshwater fish. They were to be responsible for the conservation of all indigenous freshwater fish species and their habitats within their districts of administration (section 71).

Sections of this Act, relating to the societies' functions, were written by the acclimatisation societies themselves.[58]

The Act did not provide for mandatory protection of freshwater fish by the Societies and there is no record of the acclimatisation societies negotiating with forestry, pastoral, and agricultural organisations to protect the habitats of indigenous fish, nor with regional councils to redesign culverts and dams, revegetate marginal strips, nor re-engineer waterways in the interests of indigenous fauna. To 1996, in waterways nationwide, culverts, fords, weirs, and dams impede the migrations of fish, while eels removed from drains by draglines are left to die in the sun.

5.7.7 The Conservation Law Reform Act 1990

This Act provided immunity from prosecution for 'Any person who, having unintentionally taken any freshwater fish . . . immediately returns the fish with as little injury as possible, to the water' (Part VB Freshwater Fisheries, section 26ZG).

In this Act, management of the fauna was accorded to the Crown: 'In respect of any freshwater fish other than sports fish, the Director-General may, from time to time . . . determine a closed season . . .' (Part VB 26ZP Determination of closed seasons for fishing) and 'the Governor-General may . . . prescribe a total allowable catch in respect of any freshwater fish . . .' (Part VB 48A).

Landowners and land occupiers were permitted to fish without licence from waters which passed through their land (Part VB, section 26ZO). Where the Act dealt with rights of landowners and with taking sports fish without licence, Maori fishing rights were acknowledged with the clause 'Nothing in this Part of this Act shall affect any Maori fishing rights' (Part VB, section 26ZH).

Maori were prohibited from taking introduced sports fish without a licence (Part VB 26ZI), unless they were the occupiers of the land: 'Subject to this Act, any person who is the lawful occupier of any land may fish on such land or waters within that land without a licence . . .' (Part VB 26ZO).

Acclimatisation societies were replaced with fish and game councils.

5.7.8 The Resource Management Act 1991

This Act provided for 'The protection of significant habitats of indigenous fauna' and for 'The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga (Part 2, section 6); for 'Kaitiakitanga', 'Intrinsic values of ecosystems', Maintenance . . . of the quality of

58. McDowall, *Gamekeepers for the Nation*, p 59

the environment', and 'Any finite characteristics of natural and physical resources' (Part 2, section 7).

'The protection of the habitat of trout and salmon' was specifically required (Part 2, section 7). No indigenous fish received specific protection of its habitat, although the endangered status of some species had been noticed by the International Union for the Conservation of Nature in 1981.[59]

Regional councils were accorded 'control of the use of the land' for the purpose of 'The maintenance of the quantity of the water in water bodies', 'taking, use, damming, and diversion of water', 'Discharge of contaminants into and onto land, air, or water', and so on (Part 2, section 30). In 1996 thousands of kilometres of streambed were still unavailable to fish passage.

Since 1983 legislation has provided for the protection of indigenous fish and their habitats. In 1996 neither the fish and game councils nor the regional councils, both statutory bodies, had discharged their statutory responsibilities. Swamp drainage and the straightening of drains continued nationwide. Dragline operators left eels to die in the sun. Culverts and dams continued to block upstream migrations of fish; property owners continued to receive permits to draw off water; household and farm sewerage continued to be diverted into streams; stream banks remained unforested; spawning grounds remained unfenced. Some fisheries scientists have concluded that Maori interests in freshwater fisheries will not be realised through legislation. What is needed is a spirit of cooperative willingness to restore waterways.

Five statutory processes deprived Maori of their harvests from freshwater fisheries:

(a) From around 1864 acclimatisation societies colonised waterways with introduced game fish. They were statutory bodies, supported by the statutes, with a prior interest in predatory game fish.

(b) Native fish populations were weakened by predation and competition for territory and food supplies in many locations, or were eradicated. Longfin eels and shortfin eels were eradicated in vermin extermination campaigns throughout the country, in an attempt to secure the establishment of trout.

(c) The Crown (from 1892) and later the acclimatisation societies (from 1951) pre-empted rights over the harvesting of New Zealand waterways (through sale of licences and prosecution). Up to 1996 the Crown has maintained that Maori do not have special rights in the whitebait fishery. The Crown pre-empted rights over management of harvests (through closed seasons and prosecution) and over management of waterways (through Water and Soil Conservation Act 1967, Water Pollution Act).

(d) Maori practices (taking fish only for food; trapping at times of optimal food value; maintaining purity of waterways), based on long experience of the fauna, were not incorporated in the statutes or were not enforced.

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59. G R Williams and D R Given, *The Red Data Book of New Zealand*, Wellington, Nature Conservation Council, 1981; McDowall, *Natural History*, 1990, pp 94, 104, 151

(e) Habitat protection (retention of swamplands, afforestation of stream verges, estuarine reservations, headwater reservations, fish passes at dams, fords, and culverts) was not mandatory or was not enforced.

Conservation statutes enacted from 1846 to 1996 document the Crown's protection of its own interests in introduced fauna.[60] They document processes by which Maori lost rangatiratanga over the indigenous flora and fauna. The waterways, and Maori knowledge of the river fauna, were colonised, just as the land had been.

5.8 THE LOSS SUSTAINED

The statutes displaced Maori interests in the indigenous fauna with interests in an introduced fauna.

Statutes removed indigenous freshwater fauna from the values accorded in Maori economy, and re-assigned them according to the interests of colonial settlers. So Maori lost their economic and social interests in the flora and fauna: hawks, shags, and eels became vermin.

Statutes removed indigenous fauna from the authority of local land-holding groups and gave discretionary powers to the Crown to declare the length of closed seasons, to schedule species as protected or unprotected. Iwi and hapu lost rangatiratanga over the fauna of their whenua.

Statutes protected the conditions for introduced fauna to thrive and did not provide for the needs of indigenous fauna. Predatory game fish displaced native fish from lakes and waterways. Spawning grounds of inanga and kokopu were and continue to be damaged by stock and logging. Maori lost their self-sustaining harvests.

The fragmentation of faunal resources in which Maori have economic interests, and the accompanying fragmentation of Maori knowledge, is highlighted by reports on thriving populations of introduced sports fish. These introductions were supported by Crown statutes, Government funding and research, and public participation. Brown trout, for example, were introduced in the 1860s and by the 1920s their acclimatisation was a 'phenomenal success . . . the most successful piece of acclimatisation work undertaken in this colony'. After rainbow trout were introduced in the 1880s, 'a policy of stocking rivers and lakes was pursued vigorously, with spectacular successes in the lakes of the central North Island . . . forms the basis for important and valuable recreational fisheries'. Tench were introduced in 1867. 'As a result of their growth to large size in New Zealand waters, tench are now a prized target of a significant group of course fishermen in the Auckland area'. Rudd were introduced around 1967 and by 1990 they were 'well established . . . widely present . . . very boring and not favoured as food'. Koi carp

60. That is, the statutes give priority to trout; trout compete with indigenous fish for territory and food. Water conditions that are optimal for trout are not the conditions optimal for indigenous fish; trout will be found in mid-stream, exposed to light, where indigenous fish require forest cover and overhanging banks.

were released around 1980. Ten years later they are 'an undesirable species for New Zealand ... aggressive colonists of new habitats ... growing rapidly in the Waikato'.[61]

During a millenium of Maori occupation, New Zealand river systems teemed with migrations of freshwater fish. Hapu living along the banks of rivers observed the fish in their local waters; overall, Maori have an interest in every one of the 27 species and their population variants. These interests are in the harvesting of a self-sustaining resource for subsistence (economic), trade (commercial), and social-ceremonial purposes. The resource (harvest, technology, and knowledge) comprises both whenua and taonga:

> the methods of procuring fish were based upon careful observations of the generations of fishermen who studied the habits, food supplies and seasons of the various fish frequenting the waters that formed an important part of the tribal territory.[62]

Crown policy (through Marine Department, Ministry of Agriculture and Fisheries, Department of Conservation, NIWA, and the universities) has been to insist upon the exclusive use of an international system of classification, while ignoring the knowledge developed by indigenous New Zealanders during a long acquaintance with the biota. This policy has been a critical factor in the loss to New Zealand of the resource itself, for want of appreciation of the resource and for want of understanding of the ecological and habitat protection it needs.

The river fauna is now depleted and marginalised, surviving precariously in remnant forest swamps: 'The general abundance and distributions of virtually all indigenous fishes in New Zealand's fresh waters have declined since the European settlement of the country'.[63] It is not possible for fisheries scientists to construct a body of knowledge which can compare with the minutely detailed contributions of each hapu to the collective body of knowledge acquired by Maori from astute observations and wily interactions, made when New Zealand river systems coursed with migrating fish. Twenty species of introduced fish have now colonised the waterways and a new saga has begun.

World science has lost a complex and astutely observed body of knowledge of an ancient fauna. Maori have lost a resource of prolific abundance, and a body of knowledge and technology which at 1840 procured harvests sustaining their people in well-being and prosperity. By means of forest clearance, swamp drainage, pine forestry, and the introduction of predatory salmonid fish, this prosperity was lost to Maori in favour of a market economy in which most Maori have experienced marginalisation and impoverishment.

Up to 1996, Maori knowledge of river fauna has not received research and development funding which would enable Maori to develop the 1840 knowledge

61. McDowall, *Natural History*, pp 186–188, 231–243
62. Te Rangi Hiroa (P Buck), 'The Maori craft of netting', in *Transactions and Proceedings of the New Zealand Institute*, vol 56, 1926, pp 597–646; McDowall, *The Whitebait Book*, p 84
63. McDowall, *Conservation and Management*, p 4

base in its own direction. A theory of lunar periodicity does not neccessarily lead to a policy of 'preserving biogenetic diversity'. Nor does it necessarily lead to 'copyrighting intellectual property'. It does lead to protection of riparian zones and marginal strips; to guardianship of stream beds, stream environments, stream headwaters, and estuaries; to unhindered passage for migrating fish; to purity of water; and to good reasons for not mixing one water-system with another.[64]

5.9 COMMISSION: WHETHER MAORI WERE DEPRIVED OF INTERESTS BY SUCH POLICIES OR WHETHER THEIR INTERESTS WERE DIRECTLY OR INDIRECTLY SAFEGUARDED AND IF THERE WAS A LOSS OF INTERESTS WHETHER THAT LOSS WAS COMPENSATED

As the statutes were passed, Maori lost rangatiratanga over the indigenous flora and fauna. Today the resource provides little sustenance.[65] With Animal Protection Acts, Conservation Acts, and Resource Management Acts the indigenous biota became a taonga of the Crown, a prohibited Gondwanaland remnant safe-kept on offshore refuges. On the mainland an introduced biota flourishes in its place.

5.9.1 Wildlife schedules

Decisions on the scheduling of wildlife in statutes were made in the interests of an introduced fauna. Native hawks, shags, and eels were excluded from protection in the interests of introduced game in the Animals Protection Act 1907; the Animals Protection and Game Act 1921; and the Wildlife Act 1953. In the Fisheries Act, 1983 the acclimatisation societies wrote the statutes that governed them.[66]

(1) *The Animals Protection Act 1907*

The Animals Protection Act 1907 was 'An Act to consolidate and amend the Law for the Protection of Animals and for the Encouragement of acclimatisation societies'. Acclimatisation societies were accorded statutory powers to pursue their interests under sections 52–57. Maori interests in faunal management were not considered.

Acclimatisation societies and the Minister of Internal Affairs were accorded property rights in introduced fauna – section 55. Maori were not granted property rights in their technology, knowledge, and harvests.

The Governor (under sections 5, 20, 24, 25, 28, 50) and the Minister of Internal Affairs (under section 33) were accorded authority over scheduling, harvesting,

64. In some species, fish migrating in from the sea possibly locate their ancestral streams by the smell of the water. Each stream is the territory of a limited number of species and when waters are mixed roe may be transferred, altering long-established balances.

65. 'The general abundance and distribution of virtually all indigenous fishes in New Zealand's fresh waters have declined since the European settlement of the country' (McDowall, *Conservation and Management*, Wellington, New Zealand Department of Conservation, 1991, p 4).

66. R M McDowall, *Gamekeepers for the Nation*, Christchurch, University of Canterbury Press, 1994, p 59

hunting, and selling of indigenous fauna. The Governor could regulate 'the season during which godwits may be killed' and 'the taking of any imported game or native game within any domain or forest reserve' (section 50(h, i)).

The Act contained six schedules:

- First Schedule: Imported Game [deer, pheasants, and so on].
- Second Schedule: [Specified indigenous fauna scheduled as 'native game', and subject to closed seasons, purchase of licences for hunting and selling, prohibitions on trapping, snaring, and netting techniques, and hunting in reserves: kereru, kuaka (godwit), wild duck, and so on – sections 19, 27].
- Fifth Schedule: Birds, Animals, and Reptiles to be protected [Specified indigenous fauna able to be protected, but meanwhile able to be hunted and sold: kaka, huia, kiwi, and so on – section 25].

INSERT FIGURE 1.1

(2) *The Animals Protection and Game Act 1921*

The Animals Protection and Game Act 1921 contained four schedules:

- First schedule: Animals Absolutely Protected [tuatara, kereru, kaka, huia, and so on. Native shags, hawks, and all native fish were excluded].
- Second Schedule: Imported Game.
- Third schedule: [Specified indigenous fauna scheduled as 'native game' and subject to closed seasons, licence fees, fines for breach, bag limits, hunting areas, and prohibitions on the use of traps, nets, and snares: grey duck, godwit, and so on]. Introduced possums were protected (Part 3). No protection was given to native hawks, shags, and fish.

INSERT FIGURE 1.2

(3) *The Wildlife Act 1953*

The Wildlife Act 1953 contained eight schedules:

- First Schedule: Wildlife Declared to be Game [fauna that could be hunted only with an acclimatisation society permit: all indigenous ducks, pukeko].
- Second Schedule: Partially Protected Wildlife [wildlife that could be shot under specified circumstances to protect introduced game: indigenous gulls, bush hawks].
- Third Schedule: Wildlife That May be Hunted or Killed Subject to Minister's Notification [wildlife hunted by certain hapu: ducks, pukeko, weka mutton birds, petrels; wildlife predatory of introduced fauna: little shag, pied shag].
- Fourth Schedule: Wildlife Not Protected, Except in Areas and During Periods Specified in Minister's Notification.
- Fifth Schedule: Wildlife Not Protected [harrier hawks, kea, black shags, skinks, geckos. Acclimatisation societies were free to treat these species as vermin and offer bounties.]
- Sixth Schedule: Animals Declared to be Noxious [pigs]

INSERT FIGURE 1.3

CHAPTER 6

WHITEBAIT FISHERIES – A CASE STUDY OF MAORI INTERESTS IN RIVER FAUNA

6.1 Knowledge, Technology, Harvests

Hapu use their knowledge of fish behaviour and their technology of trapping devices to garner a harvest from wild fish. This chapter treats Maori knowledge, technology, and harvests as a single intellectual property.[1]

Whitebait shoals are composed of the transparent juveniles of five species of galaxias.[2] Today, inanga make up the whole catch in many rivers, but in harvests taken by Maori before colonial land clearances, koaro and kokopu probably were more abundant.[3]

Maori state that before colonial settlement the shoals of whitebait migrating up the Buller River 'covered the face of the water for miles in length'.[4] Pakeha settlers observed the abundance, but brought a new attitude to the resource.[5] In 1899, Clarke reported: 'The extent of the shoals . . . at times was incredible, often I have seen the surface of the chinamen's gardens . . . for several acres each in extent covered some inches in depth with these fry used as topdressing manure'.[6] In 1944, whitebait harvested for commercial canning was 'dumped by the drayload'.[7] In

1. I am following a United Nations preliminary report of 1992 which included physical resources indigenous to the territory of an indigenous people, in intellectual property (Malcom McNeill, 'Intellectual Property Law Reform and the Marginalisation of Maori', MA thesis, University of Auckland, 1995, p 53, citing UN/ E/CN.4/Sub.2, 1992, 30:2). An annotated bibliography of Maori fisheries has been compiled by McDowall (R M McDowall, *A Bibliography of Maori Fisheries in New Zealand Fresh Waters*, Christchurch, NIWA Freshwater, 1993).
2. They are the inanga, *Galaxias maculatus*; koaro, *Galaxias brevipinnis*; banded kokopu, *Galaxias fasciatus*; giant kokupu, *Galaxias argenteus*; and shortjawed kokopu, *Galaxias postvectis*. Present order of abundance in the whitebait shoals is commonly inanga, banded kokopu, koaro, giant kokopu, shortjawed kokopu. In South Westland giant kokopu are the last to migrate inland from the sea, appearing at river mouths in early November (R M McDowall, *Conservation and Management of the Whitebait Fishery*, Wellington, New Zealand Department of Conservation, Science and Research series, no 38, 1991, pp 2, 7). The source throughout is R M McDowall, *The New Zealand Whitebait Book*, Wellington, Reed, 1984.
3. McDowall, *The Whitebait Book*, p 11. Koaro and kokopu generally do not survive where streams have become exposed through forest clearance. The draining and clearance of swampland has further reduced the habitat of kokopu. Most inanga die after their first spawning, whereas kokopu and koaro live for a number of years, and it is possible that the annual cycle of the inanga, producing a rapid replenishment of its population, contributes to its having withstood habitat destruction for some time longer.
4. G G M Mitchell, *Maori Place Names in Buller County*, Wellington, Reed, 1948
5. Maori ethos is, 'We do not fish to kill fish, we fish for food'.
6. F E Clarke, 'Notes on New Zealand Galaxidae', in *Transactions and Proceedings of the New Zealand Institute*, vol 31, 1899, pp 78–91

1955 the recorded whitebait catch peaked at 322 tonnes, and thereafter to 1996 annual returns have declined. The catch in 1990 was 50 to 100 tonnes.[8]

Early nineteenth-century records indicate that inanga were trapped on two migrations: in spring as they migrated in from the sea forming a component of the whitebait shoals, and in autumn as the ripe adults returned downstream to spawn. Maori recognised the greater nutritional value of trapping the adult fish when they are rich with roe: 'In the old days they would not catch the whitebait coming up the Hokio, preferring to wait and take them when full grown they ran to sea to spawn. A few netfalls might be scooped up for a chief's delectation, but no more.'[9]

Migrations of inanga downstream into coastal estuaries to spawn, coincide with the spring tides on new and full moon, during late summer to early winter. Maori had a command of these migration patterns. A nineteenth century passage records prediction of a downstream migration, when the inanga are rich with roe:

> It was in connection with the running to sea of the inanga . . . that the Maoris had full scope for the remarkable fish-lore which they possessed. Certain amongst them, old men, could tell to a day when this annual run would commence . . . they would talk . . . about a study of the stars, the season experienced, and the phase of the moon, but would say nothing definite . . . The fact was the more remarkable in that the limited time occupied in the 'run', put guess-work out of the question. Three days it occupied – never more. Early one morning a few inangas would be noticed in the Hokio. These were the advance guard – the 'Mataaika' or 'leaders of the fish'. For a couple of hours that morning these would run at intervals, a few at a time. In the evening a few more, and then throughout the night the creek would be empty. But early one morning they would come down, a shimmering shoal . . . The third day brought a few stragglers and the run was over.[10]

This knowledge is an intellectual property. Without Maori knowledge of life cycles and seasons of migration, Pakeha could not correlate their observations of the upokororo (grayling, *Prototroctes oxyrhynchus*). In 1982 the upokororo was described by a fisheries scientist as a 'mysterious fish about whose habits little or nothing is known, found in one part of a stream today and disappearing no one knows where tomorrow'.[11] In 1901 it had a 'habit of disappearing and reappearing in a ghostly fashion'.[12] When it became extinct during the 1920s, fisheries scientists had still not unravelled the patterns of its migrations.

Whitebait fishing was a basic economic enterprise for many hapu. At 1840 inanga (*Galaxias maculatus*) in the Waikato River were the basis of possibly the largest whitebait fishery in the North Island, and before land clearances modified

7. McDowall, *The Whitebait Book*, p 106
8. R M McDowall, *New Zealand Freshwater Fishes: A Natural History and Guide*, Auckland, Heinemann Reed and MAF Publishing, p 435
9. E N D O'Donnell, *Te Hekenga: Early Days in Horowhenua*, Palmerston North, Bennett, not dated
10. O'Donnell, *Te Hekenga*
11. W H Spackman, *Trout in New Zealand: Where To Go and How To Catch Them*, Wellington, Government Printer, 1892
12. A J Rutherfurd, 'Notes on Salmonidae and Their New Home in the South Pacific', in *Transactions and Proceedings of the New Zealand Institute*, vol 33, 1901, pp 240–249

the Waikato catchment, this river sustained possibly the most important whitebait fishery in New Zealand.[13] The West Coast rivers, Waikato, Hutt, Manawatu, Waimakariri, and Mataura Rivers supported prolific whitebait fisheries.[14] In 1872 Hector recorded that whitebait 'form the food of the Maoris for many months of the year'.[15] In 1988, most fulltime whitebait fishermen on the Waikato were Maori,[16] and the Arahura River (Hokitika) was more or less exclusively a Maori fishery.

At 1840 New Zealand lakes 'teemed' with koaro whitebait. Whitney described the whole village at Waitahanui feasting on storm-cast koaro for days at a time.[17] Grace recorded that Ngati Tuwharetoa were nicknamed derisively 'kai panare' because the abundance of their resource allowed them to collect koaro stranded on the beach instead of skilfully trapping them.[18] Until the 1920s, when introduced trout had destroyed the fishery, koaro was especially important as an economic resource to Maori who lived around the central North Island lakes (Taupo, Rotoaira, Rotorua, Rotoiti, Okataina, Tarawera, Rotopounamu, Waikaremoana). Here whitebait were trapped in very large numbers. Observers described lake-locked koaro as a principal food of the Taupo Maori, and of the Arawa tribe.[19]

Koaro also populated South Island lakes: Coleridge, Sumner, Ohau, Hawea, Wanaka, Wakatipu, Te Anau, Manapouri, and others, with a population of very large-sized fish at Lake Chalice.[20]

Koaro were captured with baskets (kupenga), traps (pouraka), weirs, and seine nets. Huge seine nets were observed, as long as 100 metres by 2 metres deep.[21] In 1847, Angas described a technique of fastening a net between two canoes, while shoals of fish were driven into the net using a pole 6 metres long with a tuft at the end.[22] He illustrated another technique, the use of long-handled scoop nets from a canoe.[23]

Maori industry included techniques of preservation and storage. 'If [the whitebait] were not to be used immediately they were put on racks above the fire and dried and then packed away for use in the winter . . . the fish were packed into kits and would remain edible for some months'.[24] Hector observed in 1872 that

13. McDowall, *Natural History and Guide*, p 433
14. McDowall, *The Whitebait Book*, p 119
15. J Hector, 'Notes on the Edible Fishes', in *Fishes of New Zealand*, Wellington, Hughes, 1872, pp 97–133
16. A G Stancliff, J A T Boubee, and C P Mitchell, 'The Whitebait Fishery of the Waikato River', New Zealand Ministry of Agriculture and Fisheries, Freshwater Fisheries Report, no 95, 1988
17. C A Whitney, 'Minnows and Inanga', in *New Zealand Fishing and Shooting Gazette*, vol 14, no 5, 1941, p 10
18. J Te Heuheu Grace, *Tuwharetoa: The History of the Maori People of the Taupo District*, Wellington, Reed, 1959; McDowall, *Natural History*, pp 415–416
19. Gilbert Mair, letter, 25 October 1919, *Rotorua Chronicle*; H J Fletcher, 'Lake Taupo and Its Trout', in *New Zealand Journal of Science and Technology*, vol 2, no 6, 1919, pp 367–370; Elsdon Best, 'Fishing Methods and Devices of the Maori', *Dominion Museum Bulletin*, no 12, 1929; J S Armstrong, 'Notes on the Biology of Lake Taupo', in *Transactions and Proceedings of Royal Society of New Zealand*, vol 65, no 1, 1935, pp 88–94; W J Phillipps, *The Fishes of New Zealand*, New Plymouth, Avery
20. McDowall, *Natural History*, pp 105–107
21. Phillipps, *Fishes of New Zealand*
22. G F Angas, *Savage Life and Scenes in Australia and New Zealand*, London, Smith and Elder, 1847
23. G F Angas, *The New Zealanders Illustrated*, London, McLean
24. Best, *Fishing Methods and Devices of the Maori*

harvests of whitebait 'yield an ample supply both for daily use and to preserve for other seasons'.[25] In 1932, Foxton hapu advised Sir Apirana Ngata: 'We would like to point out that our staple food during the winter months consists of the fish dried'.[26]

Whitebait were a commercial resource, being sold and traded: 'the Grey River was very rich in whitebait in 1867. There was no difficulty getting bucketsful in a very short time. Maori gathered it and sold it very cheaply'.[27] Mair reported that from around 1860 to 1919 he had seen Ngati Pikaou netting koaro in the Ohau channel, sun-drying them, storing them for winter use, and bartering them profitably with West Coast tribes.[28] During the 1930s the Maori King Movement placed a tax on sales of whitebait from the Waikato River to fund its activities.[29]

The whitebait fishery is an intellectual property of Maori. The fishery was established by Maori, and Maori techniques of trapping whitebait were copied by Pakeha settlers: 'Well before the modern [whitebait] fishery developed the Maoris had identified whitebait as a palatable food and had devised methods for catching them. The Europeans in large measure adapted the Maori methods before developing new ways of fishing.' According to McDowall:[30]

> An early method in use in West Coast rivers was the so-called 'trench'. This was derived from a Maori method and . . . consisted of a groyne across the river channel formed either from river gravel or by setting a line of sacks filled with gravel. At intervals a gap was left and a set net was placed in the opening. The net was built of supplejack and had a D-shaped opening . . . The fish swimming upstream, unable to move up past the groyne, made for the flow of water through the gap where the net was placed.[31]

Twentieth-century trap nets designed by the Nolan brothers in the 1940s, and the 'Southland Sock' introduced to the Haast by the Russ brothers in the 1970s,[32] were possibly based on a new design of 'fyke' net introduced by the Dutch,[33] and are not developments of Maori hinaki as such. However, their employment in the whitebait fishery is an outcome of the technical knowledge-base developed by Maori.

A second whitebaiting technique adapted from Maori was the use of man-made side channels, which diverted whitebait out of the mainstream into holding ponds where they could be dip-netted.[34]

The whitebait fishery has now lost much of its reverence and festival. In the nineteenth-century practice of some hapu:

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25. Hector, pp 97–133
26. McDowall, *The Whitebait Book*, p 93, citing Marine Department files
27. C J Pfaff, *The Digger's Story*, Wellington, Wright and Carman, 1914; McDowall, *The Whitebait Book*, p 98
28. *Rotorua Chronicle*, 25 October 1919
29. Michael King, *Te Puea. A Biography*, Auckland, Hodder and Stoughton, 1973
30. McDowall, *The Whitebait Book*, p 139
31. McDowall, *The Whitebait Book*, pp 139, 140
32. McDowall, *The Whitebait Book*, pp 143, 145
33. McDowall, *Natural History*, p 426
34. McDowall, *The Whitebait Book*, p 140

> when the first catch . . . was made some were set aside as offerings to the Gods and the rest were consumed in a ceremony feast. The cooking was done in five different ovens for five different eaters: one for the priest, one for the chiefs, one for the women, one for the fishermen and another for the bulk of the people.[35]

Priority in the development of whitebait fisheries by Maori has not been admitted in some statements by fisheries scientists: '[whitebait research] began in New Zealand in the 1860s with the first efforts to determine the whitebait's identity . . . The first reported observations of [inanga] spawning go back to at least the 1890s . . . the indigenous fauna is . . . little known outside a small group of specialists and enthusiasts'.[36]

6.2 MAORI AND KOARO VERSUS TROUT

The saga of 'Maori and koaro versus trout' began with the introduction of brown trout in 1867, followed by a vigorous stocking policy which has colonised New Zealand waterways with seven predatory salmonids. Acclimatisation societies, provincial councils, Internal Affairs (Tourist and Publicity Department), Marine Department, Ministry of Agriculture and Fisheries, and currently the fish and game councils, have all participated in this venture. 'There can be little doubt that the presence of large numbers of fast moving and highly predatory brown and rainbow trout has affected the native fish species of New Zealand's lakes and rivers, particularly whitebait.'[37]

Following the introduction of brown trout, Hutton voiced concern in 1873 that native fish are not predatory and would be unprepared for competition from trout for territory and food resources: conditions for native fish 'will soon no longer exist in our rivers';[38] but the stocking of New Zealand lakes with brown trout continued. During the 1870s, quinnat salmon and brook char were introduced, and during the 1880s rainbow trout.

In the South Island, reports of the disappearance of upokororo (grayling) from the Inangahua and Buller Rivers were circulated during the 1880s.[39] In 1892, W H Spackman commented that trout 'seemed too much' for the upokororo.[40] In

35. D H Graham, *A Treasury of New Zealand Fishes*, Wellington, Reed, 1954
36. McDowall, *Natural History*, pp 65, 120, 461. Fisheries scientists did not themselves observe whitebait spawning until the 1920s. A E Hefford reported: 'For spawning the shoal approached the very margin of the river at the time of high water. The minute eggs are deposited among rushes, grass, clover, or other vegetation which afford concealment for the spawning fishes and cover for the eggs which adhere in small clusters or groups on the ground about the bases of the stems of rushes or grasses. Spawning did not take place till the highest of the spring tides had passed . . . The spawn is thus assured complete protection from any aquatic enemy' (McDowall, *The Whitebait Book*, p 67).
37. McDowall, *The Whitebait Book*, p 174
38. F W Hutton, 'On the Geographical Relations of the New Zealand Fauna', in *Transactions and Proceedings of the New Zealand Institute*, vol 5, pp 227–256
39. *Otago Daily Times*, 23 March 1910
40. W H Spackman, *Trout in New Zealand: Where To Go and How To Catch Them*, Wellington, Government Printer

1897, Rotorua hapu starting making public their disquiet at the loss of their koaro fishery in the Central Plateau lakes, and petitioned the Rotorua Town Board, objecting to the further release of trout in their lakes;[41] they held koaro in much higher regard than trout.[42] Acclimatisation societies continued to release salmonid fish; Thomson estimates that by 1916, 50 million brown trout had been released into New Zealand streams.[43] During the 1920s the Minister of Internal Affairs had a vision of trout sold commercially as a cheap fish for the people, but he too was opposed by the acclimatisation societies.[44]

Around 1913, the Government acted on advice that trout had exhausted their food supply of native koaro; from 1913 to 1920 an estimated 100,000 to 240,000 trout from the Rotorua–Taupo lakes were netted then sold or buried.[45] In 1920 an entomologist on contract to the New Zealand Government reported that trout had caused very serious declines in aquatic insects in the Rotorua–Taupo lakes.[46] With the depletion of both koaro and aquatic insects the Tourist Department sought another way of sustaining the trout fishery.

The saga of 'koaro and Maori versus smelt' began in 1906, when the Tourist Department extracted native common smelt from the Waikato River and released them into Lakes Rotorua and Rotoiti.[47] Releases of smelt into lakes continued: Lake Rotonui-a-ha; Lake Taupo (1920s, 1934), Lakes Okataina and Tarawera (1931), Lakes Tarawera, Rotoma, Okataina, Rotehu, Rerewhakaaitu, Ngapouri, Okaro (1932), Lake Waikaremoana (1949), Lakes Parkinson, Ngatoa, Putere, Heaton, Williams. These introductions were undertaken by acclimatisation societies, authorised by fisheries inspectors, and by 1955 Stokell was commenting, 'It is little short of tragic that authority in such matters should be vested in uninformed bodies'.[48] The releases continued, and from 1959 to 1964 smelt were introduced into South Island lakes with koaro fisheries.[49] In 1980 Dinamani and Hickman commented: 'The ignorance and lack of action in the past is not entirely the fault of government agencies; it is also the fault of the system by which amateur bodies are given [statutory] responsibility for managing a natural resource'.[50]

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41. P J Burstall, 'Trout Fishery: A History Of Management', in D J Forsyth and C Howard-Williams, *Lake Taupo – Ecology of a New Zealand Lake*, New Zealand Department of Scientific and Industrial Research, Information Series no 158, 1983
42. Te Rangi Hiroa (P Buck), 'Maori Food Supplies of Lake Rotorua', in *Transactions and Proceedings of the New Zealand Institute*, vol 53, pp 433–451
43. G M Thomson, *The Naturalisation of Animals and Plants in New Zealand*, Cambridge University Press, 1922
44. McDowall, *Gamekeepers for the Nation*, p 139
45. Burstall, *Trout Fishery*, p 123
46. R J Tillyard, 'Report on the Neuropteroid Insects of the Hot Springs Region, New Zealand, in Relation to the Problems of Trout Food', in *Proceedings of the Linnaean Society of New South Wales*, vol 45, pp 205–213
47. McDowall, *Natural History*, p 70
48. G Stockell, *Fresh Water Fishes of New Zealand*, Christchurch, Simpson and Williams, 1955
49. McDowall, *Natural History*, pp 70–71
50. P Dinamani and R W Hickman, *Proceedings of the Aquaculture Conference*, Fisheries Research Division, Occasional Publication no 27, Wellington, New Zealand Ministry of Agriculture and Fisheries, 1980, p 45

Common smelt withstand trout predation, possibly because, whereas koaro live for several years, common smelt are shortlived and spawn only once, rapidly replacing their population. McDowall commented:

> When trout were first introduced into our lakes, they teemed with . . . huge shoals of land-locked koaro whitebait . . . once so abundant in some lakes that the Maoris used to catch it by the 'hundredweight' . . . It was not until the 1920s and 1930s when smelt . . . were introduced that trout size and condition recovered again . . . Although there are huge numbers of smelt in these North Island lakes, the populations of koaro haven't recovered. Most anglers don't even know there is a lake whitebait. Possibly the failure of the koaro populations to recover in lakes like Taupo is because the smelt populations have occupied the habitat that originally belonged to the koaro whitebait.[51]

During the 1980s and 1990s, with extensive declines in whitebait catches in the Waikato River and elsewhere, common smelt have been harvested and sold on the market as 'second-class whitebait'.[52] Contemporary Maori have a second-class product to replace their koaro fisheries.

6.3 STATUTES

In 1894, the first Whitebait Fisheries Regulations were introduced. They made weir and trench trapping techniques used by Maori illegal: 'No scrim or whitebait net shall be used as a set net or be set or placed in openings made in the banks of rivers or streams or in dams constructed therein.'[53]

In 1896, further regulations affecting whitebait harvesting were introduced, and applied to Maori and Pakeha alike. A limited harvesting season was imposed. A prohibition was placed on frightening fish towards the net, a concept developed by Maori and adopted with technological innovation by Pakeha. The net size was restricted. Commercial exploitation of whitebait was permitted.[54]

In 1922, hapu at Arahura claimed rights under the Treaty to trap and sell whitebait from a river of their rohe, the Arahura (Brunner). In 1930, Taranaki hapu claimed rights under the Treaty to practise their fisheries unhindered by statutory restrictions; they also made representation in regard to Pakeha exploitation of the fishery and the diminishing runs. In 1932, Ratana Maori made representation to the Crown claiming their right under the Treaty to practise their fisheries, and hapu at Foxton wrote to Sir Apirana Ngata. In 1922, in 1932, and again in 1955, Maori representations were rejected; the Crown reasserting that Maori do not have special rights in the whitebait fishery. The Marine Department also adopted the position

51. McDowall, *The Whitebait Book*, p 175
52. McDowall, *Natural History*, pp 433, 434
53. McDowall, *The Whitebait Book*, pp 129, 140
54. McDowall, *The Whitebait Book*, p 129

that 'there could be no question of possession of a fishery in tidal waters on the part of anyone [Maori or Pakeha] since tidal waters belong to the Crown'.[55]

In 1869, it was recorded in Greymouth that whitebait were sold commercially by Pakeha for sixpence a pint,[56] and during the 1870s Chinese gold diggers in the South Island trapped, dried, marketed, and exported whitebait.[57] In 1891, Irvine and Stevenson began commercial canning of whitebait at Hokitika; they closed their Waikato cannery in 1957.[58]

6.4 Loss Of Abundance

Since 1930, when fisheries scientists belatedly became apprised that inanga did not spawn in stream gravels but on the banks of estuaries,[59] there has been gradual awareness that trout and smelt are part of a complex of factors cumulatively bringing about decline in the whitebait fishery. Also, indigenous fish have lost their habitat to the pasture lands and pine forests of a market economy introduced by colonial settlers. In 1991, McDowall reported on the management of the whitebait fishery for the Department of Conservation:

> It is said that for many parts of New Zealand there has been a long-term decline in the amount of whitebait entering rivers, and this is unarguable . . . Huge areas of habitat suitable for their feeding, growth and reproduction have been lost, especially lowland, forested streams and wetlands . . . There can be no doubt that a major contributor to declines in abundance of whitebait in virtually all rivers has been habitat deterioration. This has resulted from deforestation, wetland drainage, sedimentation, channelisation, pollution, impoundment, water abstraction . . . With the amount of historical change that has occurred to the habitats of the various whitebait species, the whole question of . . . habitat characteristics must be a matter of profound and primary concern.[60]

The statutes do not protect Maori interests in the whitebait fishery. Further, the statutes treat Maori interests as expendable to game fishing based on introduced salmonids. Under Whitebait Fishing Regulations gazetted in 1932, Wanaka hapu were prohibited from catching 'Matukituki whitebait' (koaro, *Galaxias brevipinnis*), because it was an important food for trout in Lake Wanaka.[61] When the Whitebait Fishing Regulations were rewritten in 1981, this regulation remained in force.

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55. McDowall, *The Whitebait Book*, pp 93–94
56. *West Coast Times,* 25 August 1869; McDowall, *The Whitebait Book*, p 102
57. *West Coast Times*, 14 December 1875; McDowall, *The Whitebait Book*, p 100
58. McDowall, *The Whitebait Book*, pp 103, 109
59. A E Hefford, 'Whitebait Investigation', in *Annual Report on Fisheries*, New Zealand Marine Department, 1932, pp 13–15
60. McDowall, *Conservation and Management*, pp 4–9
61. McDowall, *Natural History*, p 112

Meanwhile, the statutes had protected trout, from 1867 with closed seasons (Propagation of Salmon and Trout Act), and from 1892 with angling licences (Fish Protection Ammendment Act). Current legislation requires water quality in streams to be fit for trout; trout, however, are midstream feeders. No legislation requires stream margins to be forested to achieve the qualities needed to restore the abundance of native fish populations. Further, up to 1996 the legislation has restricted Maori in the traditional practice of their whitebait fisheries, while allowing everyone to enter the fishery as commercial operators.

In summary, in 1840 river hapu reaped a sustaining and surplus harvest from their whitebait fisheries. The harvest was preserved, stored, traded, and sold commercially. Observations by Angus, Hector, Captain Gilbert Mair, and others alerted the Crown to the importance of whitebait in the survival of many hapu.

As the statutes allowed a greater number of people to enter the fishery, in order for Maori harvests to be sustained an increasingly greater area of breeding grounds required protection, particularly estuary margins and swamplands; safe passage for schools migrating up streams into adult habitats required legislation. Advice on these measures was available to the Crown, from 1840 from river hapu, and from the 1930s from fisheries scientists.

The Crown, however, did not act to protect Maori interests: breeding grounds were not protected and extended but instead were reduced by agricultural clearances and settlement along margins; the fishery did not remain under the control of river hapu but became instead commercialised and over-exploited; upstream passage was often blocked by culverts and dams, while feeding grounds were destroyed by pine forestry practices and by dredging and straightening of drains in the interests of increasing agricultural production; Maori were allowed no input into the writing of statutes and regulations pertaining to the fishery; Maori traditional trapping techniques were made unlawful while elaborate jetties and huge nets of European concept were allowed (see figure 6); Maori technology was pre-empted (see figure 5) while river hapu received no allocation of research and development funding to advance their technology and knowledge; a subtle body of Maori knowledge of the fishery was variously ignored, pre-empted, discredited, and allowed to become fragmented while fisheries scientists to 1996 still had not developed an adequate understanding of the fishery.[62]

(1) *Inanga life cycle*

In autumn, adult inanga, *Galaxias maculatus*, migrate downstream to spawn on spring tides amongst sedges on estuary banks. The larvae hatch when the spawning grounds are flooded by the next spring tide, and are swept out to sea, where they spend the winter in the warm ocean, feeding on its rich sources of zooplankton. In spring, the whitebait migrate into river mouths and progress upstream, where they spend the summer feeding on aquatic insects and reaching maturity.[63]

62. See for example, R M McDowall, G A Eldon, M L Bonnet, J R E Sykes, 'Critical habitats for the conservation of shortjawed kokopu, *Galaxias postvectis',* Clarke, Wellington, Department of Conservation, Conservation Sciences Publication 5, 1996

(2) *The whitebait catch*

The whitebait catch is made up of the transparent juveniles of five species of *Galaxias*. Koaro are the first to run after floods; fat-bodied, slimy, milky (enter snow-fed, milky rivers). Inanga are currently the most common in the whitebait catch. Banded kokopu are the smallest whitebait; pale amber. Giant kokopu are rare; paler amber. Shortjawed kokopu are the rarest; indistinguishable from koaro. Each of the whitebait develops a distinct adult appearance.[64]

A inanga, *Galaxias maculatus*
B banded kokopu, *Galaxias fasciatus*, 'golden bait'
C koaro, *Galaxias brevipinnis*, 'run bait, jelly bait, elephant ears',
D giant kokopu, *Galaxias argenteus*
E shortjawed kokopu, *Galaxias postvectis*

63. C P Mitchell and G A Eldon, *How to Locate and Protect Whitebait Spawning Grounds*, [1991], p 9
64. McDowall, *The New Zealand Whitebait Book*, 1984, pp 11–14, 53

(3) ***Whitebait adults***

(4) *Derivation of the whitebait fishery from Maori technology*

5.1. The 'trench' technique of trapping whitebait, used by colonists (McDowall, *The New Zealand Whitebait Book*, p 139)

5.2. An inanga weir, constructed by Maori (Best, *Fishing Methods and Devices of the Maori*, p 204)

5.3. Weir with hoop nets, technique used by colonists (R M McDowall, *The New Zealand Whitebait Book*, 1984, p 140)

5.4. Weir with hoop net, constructed by Maori (E Best, *Fishing Methods and Devices of the Maori*, 1929, p 214)

5.5. Diversion channel, technique used by colonists (R M McDowall, *The New Zealand Whitebait Book*, 1984, p 140)

5.6. Diversion channel, constructed by Maori on the Wanganui River for trapping common smelt (R M McDowall, *The New Zealand Whitebait Book*, 1984, p 89)

5.7. Diversion channel, constructed by Maori (E Best, *Fishing Methods and Devices of the Maori*, 1929, p 206)

5.8. Diversion channel, constructed by Maori (E Best, *Fishing Methods and Devices of the Maori*, 1929, p 215)

In 1996 the whitebait fishery was commercial and selling was unlicensed. Whitebait fetched $50–$60 per kilo and were described as 'liquid gold'. Stands were bought and sold privately, owned privately, and licensed to the Crown. The technology of the fishery included access to rivers by jet boat and aircraft; walkways 23 metres long; pulleys for raising large box traps; and screens directing fish into the mouths of the traps (*NZ Herald*, 16 November 1996, p G10).

CHAPTER 7

LOSS OF HARVEST

7.1 A Fauna with Too Few Lovers

Each locality has its own unique body of Maori knowledge, and its own history of encounter with land clearance. At 1840 each hapu had a highly developed inventory of trapping techniques. Trapping was correlated with seasonal abundance and with eccentric habits, that is, hapu accommodated their social life to faunal activity. West Coast hapu would spend the spring on the coast fishing for whitebait and upokororo, and then disperse inland to eel-fishing camps for the summer.[1]

Freshwater fisheries were a staple component of hapu economy: eels, piharau (lamprey), upokororo (grayling), kokopu, inanga, waikaka (spring eels, mudfish), papanoko (torrentfish), and so on. Since 1840 the upokororo has become extinct, populations of koaro have become greatly reduced, and the survival of the shortjawed kokopu and giant kokopu are at risk. Practices of agriculture, forestry, industry, drainage, culverting and roadworks, hydro-electric dam construction, and foreign fish introductions have impoverished and destroyed Maori freshwater fisheries. What remains is possibly 10 percent of forest and 10 percent of wetland habitat within which competition from introduced species and deteriorating conditions further deplete harvesting.

Hapu lost their harvesting resources apace with their loss of whenua, their knowledge-base, and the role of caretakership (kaitiaki). The settlers who occupied their lands did so with an absence of protection for habitat and an absence of respect for hapu knowledge-base. The indigenous wildlife became a fauna with too few lovers.

7.2 Calendar of Faunal Abundance

Pakeha settlers described 'shoals of inanga . . . literally miles in length travelling downstream to the spawning grounds'.[2] Eels also 'may come in colossal numbers'. There have been reports of them coming upstream in shoals kilometres long and metres wide for hours without ending.[3] In 1845 Ligar recorded that kokopu were an

1. A J Anderson, transcript of evidence presented at the Ngai Tahu Mahinga Kai hearing of the Waitangi Tribunal, Tuahiwi Marae, April 1988. The researches of R M McDowall are used throughout this chapter.
2. *Weekly News*, 15 November 1949
3. R M McDowall, *The New Zealand Whitebait Book*, Wellington, Reed, p 23

important food for Waikato Maori.[4] In 1848, the upokororo (grayling) was caught by Brunner in a seine net in the Buller River, in a shoal of 50.[5] Charles Douglas observed during the 1860s that the giant kokopu in South Westland was 'common all over the country wherever a bog hole or dark bush creek exists' and the koaro was even more so.[6]

Also during the 1860s, Captain Gilbert Mair described Maori trapping of adult koaro in the Hamurana Stream (Rotorua) at night. Two hours after the net was lowered 'several hundredweight of the fat little fish were emptied into the canoe. This process was repeated during the night till quite a ton weight had been obtained . . . Of course the introduction of trout was the death knell of the koaro'.[7] Pfaff recalled, 'The Grey River was very rich in whitebait in 1867. There was no difficulty in getting bucketsful in a very short time. Maori gathered it and sold it very cheaply'.[8] During the 1880s whitebait were taken from the Hutt River (Wellington) in 'cartloads'.[9] In 1869, the upokororo was so abundant that a mill wheel was brought to a 'standstill' because the channel was choked with thousands of fish.[10] The upokororo was described as 'the most common freshwater fish in many parts of New Zealand, which, before the introduction of the trout, was once taken by the cartload from the Wairau River in Marlborough'.[11] In 1874 the upokororo disappeared from the Waikato River,[12] and in 1884 it was reported to have disappeared from the Inangahua and Buller Rivers.[13]

In 1892 Spackman attributed the decline of grayling to trout,[14] while in 1899 Clarke reflected that it was 'piteous . . . to see the enormous quantities of young grayling which were destroyed' as a result of capture by West coast whitebaiters.[15] In 1901 Rutherford again attributed the decline of grayling to trout.[16] From 1930 there were no further sightings of upokororo. McDowall reflected on the faunal loss that had occurred by the 1940s:

> My grandfather, who farmed the banks of the Ohau from the early 1900s, took substantial [whitebait] catches – 20kg or more – from this river. When he took us whitebaiting in the 1940s, catches of 5 kg could be expected during good runs. By

4. C W Ligar, MS Diary 22 November 1845–19 November 1846, Auckland Public Library
5. T Brunner, *Journal of An Expedition to Explore the Interior of the Middle Island of New Zealand*, Nelson, Examiner Office, 1848
6. R M McDowall, 'Charles Douglas, Explorer: His Notes on Freshwater Fishes', in *Journal of the Royal Society of New Zealand*, vol 10, no 4, 1980, pp 311–324
7. McDowall, *The Whitebait Book*, p 91
8. C J Pfaff, *The Digger's Story*, Wellington, Wright and Carman, 1914
9. McDowall, *The Whitebait Book*, p 99
10. B G Moss, 'Upokororo, New Zealand's Mystery Fish', in *Ammohouse Bulletin*, vol 1, no 5, 1958, p 5
11. W J Phillips, Life-history of the New Zealand Grayling', in *New Zealand Journal of Science and Technology*, vol 6, no 1, 1923, pp 63–63
12. Elsdon Best, *Fishing Methods and Devices of the Maori*, Dominion Museum Bulletin, no 12, 1929
13. *Otago Daily Times*, 23 March 1910
14. W H Spackman, *Trout in New Zealand: Where To Go and How To Catch Them*, Wellington, Government Printer, 1892
15. Clarke, pp 78–91
16. A J Rutherford, 'Notes on Salmonidae and Their New Home in the South Pacific', in *Transactions and Proceedings of the New Zealand Institute*, vol 33, 1901, pp 240–249

> then the Ohau River ran through fully developed pastoral country. He had in the early 1900s cleared his property of dense tawa forest. The streams had probably once supported banded kokopu and giant kokopu and masses of inanga when there was still forest. By the time I was there we only saw a few inanga and the odd banded kokopu in the tiny patch of remaining bush.[17]

In 1952 the Marine Department offered the already extinct upokororo legislative protection; with hindsight Stockell blamed 'unrestricted commercial exploitation'.[18] Reflecting on the depletion in native fish stocks in 1984, McDowall pondered:

> what took evolution over a million years to accomplish has been reversed in a few short years by the efforts of a few well-meaning people introducing salmonids into southern hemisphere waters . . . it seems that the introduced trout have had quite disastrous effects on the galaxiids, extinguishing populations in some areas and causing a decline in population in others . . . Lake Taupo is now one of the finest rainbow trout fisheries in the world and although there are still koaro present, they are no longer there in the numbers that would make netting them worthwhile.[19]

In 1990, McDowall reviewed the fauna. In his assessment, lake populations of koaro 'were certainly once much more abundant than they now are and have been heavily reduced by introduced trout . . . Trout apparently accumulate near river mouths and feed there on the koaro'. Common smelt, in his assessment, 'have come to contribute a substantial proportion of the Waikato whitebait fishery as the populations of the more preferred *Galaxias* whitebait have declined'. The rapid development of the commercial eel fishery in the past 20 years:

> undoubtedly has caused a significant reduction in their abundance in many lakes and river systems . . . A very large proportion of the very large eels . . . has now been removed from many of our rivers and lakes . . . it will be many years before they are again present.

A comparison with reports of whitebait catches of last century made it 'quite clear that their abundance has declined drastically in the past hundred years'. Attempts to locate and protect habitats suitable for conservation of the Canterbury mudfish had failed: 'Waters that are suitable are in land tenure that makes reservation difficult . . . longterm survival is unlikely given management strategies of the surrounding farmland'. McDowall found that mudfish are 'very prone' to the drastic ditch digging, drain clearance, and road grading that farmers and regional councils are permitted to undertake. Local populations of common river galaxias were being affected by the removal of water for irrigation. The dwarf inanga was in need of protection in the small, dune lakes of the north Kaipara.[20]

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17. McDowall, *The Whitebait Book*, p 122
18. R M McDowall, *New Zealand Freshwater Fishes: A Natural History and Guide*, Heinemann Reed and MAF Publishing, 1990, p 86
19. McDowall, *The Whitebait Book*, p 79
20. McDowall, *Natural History*, pp 57, 74, 113, 117, 127, 148, 502, 504

A species will show signs of dwindling for a while; and then suddenly decline because its population is no longer self-sustaining. In the 1930s, the public argued over which factor was responsible for the decline in whitebait catches: excessive take by whitebaiters; predation by sea birds, herrings, eels, trout; draining of swamps, backwaters, and creeks; or damage to estuarine spawning grounds by stock.[21] In the 1990s it is understood that the disappearance of native fish from the waterways is due to a combination of factors resulting in loss of haven. Among the factors are deforestation, sedimentation and flooding, wetland drainage, river modifications, hydro-electric schemes (dams), water abstraction (irrigation), and water pollution[22] – the practices of an extractive agricultural–industrial economy.

7.3 Loss of Harvest Due to Forest Clearance

Many native fish are denizens of forest. Steep, cold streams with rapids and pools, that still retain a heavy cover of native forest, support banded kokopu (in pools), short-jawed kokopu (needs plentiful instream cover to hide in), red-finned bully (in wider streams), longfin eel (needs deep pools, large bank overhangs, log piles), koaro (in clear streams), banded kokopu, and giant kokopu.

Koaro are now rare. They disappear from streams once the forest canopy has been removed. In occasional streams not modified by forestry and agriculture, koaro may still be found in very large and dense populations. Forested streams are probably the habitat required for spawning lamprey.[23]

Canopies of unlogged native forest control conditions of light exposure and water temperature, create stable stream beds and banks, stable pool-and-riffle sequences, and provide insect foods and instream cover such as logs; forest litter affects the chemical and nutrient quality of streams. There is a causal relationship between forest clearance, deterioration of freshwater environment, and loss of abundance:

> Clearing of forests has had a serious effect on populations of many native species . . . Removal of cover over streams increases both light penetration and temperatures, and also would have caused greater river instability, more serious flooding, and increased sedimentation. All of these would have affected the algal flora of the streams . . . It is not hard to imagine that numbers [of lampreys] have declined greatly, especially if, as we suspect, spawning took place in small, bush-covered streams; the loss of forest cover from the catchments of many New Zealand waterways has had profound effects on the fish fauna.[24]

Once the forest has gone from river catchments and has been replaced by pastoral farmland, the fish fauna changes abruptly:

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21. McDowall, *The Whitebait Book*, p 183
22. McDowall, *Natural History*, p 473
23. Ibid, pp 105, 109
24. Ibid, p 331

> [Unforested streams] are prone to instability of banks and bed, they often flood badly, pool-riffle sequences are destroyed so that habitat diversity declines, temperatures are variable, and they are often polluted. Primarily all that remains of the native fauna are lamprey ammocoetes, longfin eels, sometimes shortfin eels, common bully, sometimes upland bullies, sometimes redfinned bullies, occasionally bluegilled bully and torrentfish. Banded kokopu and koaro usually disappear. Introduced brown trout appear.[25]

Deforestation was carried out without regard for Maori interests in freshwater fisheries.

7.4 Loss of Harvest Due to Deterioration in Water Quality

Native freshwater fish thrive in cold, clear, actively running water; they need a constant, organically clean, thermally and chemically stable water supply.[26] Koura need a high protein diet for optimum growth, and they are very susceptible to oxygen depletion.[27] However, mature eels in general appear to be capable of surviving in water of very low oxygen content. Glass (juvenile) shortfin eels prefer muddy and silty areas, while glass longfin eels are more numerous in clear, stony areas which support large amounts of water weed.[28] American studies found that stonefly, mayfly, and caddis-fly larvae, which are consumed by many native fish, are very sensitive to reductions in dissolved oxygen levels.[29]

Oxygen is depleted when water flows reduce and streams carry heavy loads of eroded soil. The burden of mud results from forest clearance which has been followed by erosion of catchments; erosion of stream banks by stock; construction of stop banks, which prevents deposition of silt loads onto the plains; and exposed earthworks.

When river floods invade surrounding farmlands, waterways become contaminated with chemical sprays and with silt from earthworks; and with run-off, sewage, and drainage from residential areas. Flood water serves as a medium for the transfer of disease: disease agents enter water from the faeces of infected humans and animals. [30]

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25. McDowall, *Natural History*, p 331
26. P M Hine and N C Boustead, *A Guide to Disease in Eel Farms*, Fisheries Research Division, Occasional Publication, no 6, Wellington, New Zealand Ministry of Agriculture and Fisheries, 1974, p 21
27. P Dinamani and R W Hickman, *Proceedings of the Aquaculture Conference*, Fisheries Research Division, Occasional Publication, no 27, Wellington, New Zealand Ministry of Agriculture and Fisheries, 1980, p 25
28. D R Morgan and E Graynoth, *The Influence of Forestry Practices on the Ecology of Freshwater Fish in New Zealand*, New Zealand Ministry of Agriculture and Fisheries, Fisheries Research Division, Occasional Publication, no 14, p 13
29. Morgan and Graynoth, p 16
30. Dinamani and Hickman, p 89. During 1978 the Ministry of Agriculture and Fisheries monitored Mahurangi Harbour and concluded that the source of pollution of oyster beds was run-off from surrounding farmland, particularly after moderate rain.

Water temperatures can have a profound effect on fish diseases.[31] Conditions for diseases affecting freshwater fish are greatly heightened in the muddy, slow-flowing rivers and streams which currently cross the lowland plains of Hauraki and Waikato. In 1984 the medical officer of health advised against eating 'whitebait' (adult smelt) from the estuary of the Whanganui River; in 1984 the Patea River was listed as polluted; in 1982 during the whitebait season toxic ammonia from the Kapuni ammonia-urea plant leaked into the lower Kapuni Stream.[32]

7.5 Loss of Harvest Due to Irrigation

Irrigation of agricultural lands by drawing off water from streams can cause rapid alterations in stream flows and in exposure of bank vegetation, destroying fish habitats. Irrigation draw-off has sometimes reduced rivers to the point where they no longer flow to sea at a time when fish are ready to return. Irrigation sometimes spreads smolts (fish spawn) as well as water over the paddocks.[33]

7.6 Loss of Harvest Due to Disappearance of Insects

Studies during the 1980s demonstrated that 90 percent of native insects disappear when native forest is replaced with pasture.[34]

Insects are a major component of the food of freshwater fish. Native fish are deprived of this resource by forest clearance, agricultural pesticides, and competition from introduced fish. Command of territory is synonymous with command of food supplies: the aggressive salmonids displace native fish when both inhabit the same waterway. In 1920, the entomologist Tillyard reported to the Government that trout had caused serious declines in aquatic insects in the Rotorua–Taupo streams and lakes.[35]

An effect of agricultural spraying on native insect populations was clearly demonstrated in the 1960s. Koaro feed on aquatic larvae (simuliids, chironomids, mayfly, stonefly, caddis larvae), beetles and other invertebrates blown onto the water, eggs of the common bully, worms, wetas, midges, and smaller koaro. In the Lake Taupo catchment, green manuka beetles (kekerewai, *Pyronota festiva*) swarm during the summer and are carried by strong winds in vast numbers out of the teatree scrublands around the lake shores, and onto the lake water where they float in rafts, unable to lift their heavy bodies into flight. During the 1960s, when there

31. For example, the parasite White spot (*Ichthyophthirius multifiliis*) is very common on native fishes, including eels. White spot takes 4–5 weeks to complete its life cycle at 10 degrees C. At 20–22 degrees C it takes only 4–5 days (Dinamani and Hickman, p 77).
32. McDowall, *The Whitebait Book*, pp 120, 122
33. Dinamani and Hickman, pp 9, 44
34. J C Watt, 'Beetles (Coleoptera) of Auckland', in *Tane*, vol 29, 1983, p 32
35. R J Tillyard, 'Report on the Neuropteroid Insects of the Hot Springs Region', in *Proceedings of the Linnean Society of New South Wales*, vol 45, pp 205–213

was extensive agricultural development of the Lake Taupo catchment, use of agricultural pesticides for the control of grass grub (*Costelytra zealandica*) decimated the populations of manuka beetle. When the use of DDT was discontinued, the manuka beetles returned in large numbers again.[36]

Riparian zones and marginal strips planted in native forest provide a productive source of insects for native fish.

7.7 LOSS OF HARVEST DUE TO DREDGING

As swamps have been drained, natural streams have been straightened and dredged, destroying the food resources, hiding places, and spawning gravels of native fish. Mature eels are abundant beneath undercut stream banks. Studies of the Rakaia River:

> revealed elvers to be abundant in the rapids, rifles and runs, living amongst the gravels where they sometimes occupied the same habitat as torrentfish and bluegilled bullies . . . As the eels grow larger they eventually hide beneath logs, overhanging banks, etc., and then it is the amount of cover available that limits the number of eels in a pool.[37]

Over miles of the Waikato and Hauraki plains, straight drains dredged by draglines through pastureland, often with no cover at all, have replaced meandering streams with overhanging banks, pools of varying depths, boulders, and logs which provide breeding grounds for aquatic snails and insect larvae, protective cover for fish, and spawning grounds. In clean-bottomed water-courses, flash floods, changing flow patterns, scouring, and re-dredging all prevent the formation of habitats for native fish.

Different techniques of dredging would create over-hanging banks; some compromise between farming and Maori interests would allow meandering stream courses.

7.8 LOSS OF HARVEST DUE TO SWAMP DRAINAGE

River and lake fisheries are productive in relation to the areas of swampland they water. Before the clearance and drainage of the vast kahikatea forestlands, extensive tracts of swamp, with pools enclosed by flax and raupo, occupied gaps in the forest. Inanga in vast numbers, shortfin eels, and giant kokopu migrated into these habitats:

> The Manawatu was historically a great river but is no longer so . . . Its high productivity . . . was undoubtedly due to the vast areas of lowland swamps that once

36. McDowall, *Natural History*, p 194
37. Ibid, p 59

> characterised the Manawatu Plains. These provided extensive habitat for inanga, giant kokopu and banded kokopu. Now such tracts of land are among the most productive farming country in New Zealand. Swamps have been drained, streams channelised, the forest felled and the whitebait have largely gone.[38]

Waikaka, mudfish or mudeels,[39] are prized by some hapu as a food for presentation at feasts.[40] Waikaka live in swamps, creeks, and drains that tend to dry up in summer. Drainage of swamps for farmland has lowered watertables and fragmented their habitat; without a safe haven they are preyed on by shortfinned eels, trout, and perch. In 1979, Eldon drew attention to a configuration of adverse conditions which make survival of mudfish precarious: exaggerated flood/drought cycles, water abstraction, stream channelling, and introduction of exotic predators.[41]

The Canterbury mudfish 'is the most threatened' fish in the freshwater inventory.[42] In 1990, McDowall noted:

> efforts to re-collect [mud]fish from localities mentioned in earlier publications have frequently proved fruitless, usually because the locality has been 'developed' to pasture . . . The future of the species does not look good as further swamplands are drained and transformed . . . Longterm residents of Pirongia have described the steady decline in the black mudfish in that area, resulting from land development, drain clearance and the use of herbicides . . . The extensive low country of the lower Waikato undoubtedly had numerous swamps populated by black mudfish. The Hikurangi Swamp is effectively gone, converted to farmland, and plans are afoot to process peat from the Kaimaumau Swamp . . . one by one, the remaining habitats of the black mudfish are being lost.[43]

Several large rivers draining the Tararua and Rimutaka Ranges flow through Lake Onoke (Wairarapa) into the sea; the outlet of Lake Onoke was an important whitebait fishery. Large areas of swampland along the margins of the lake contributed to the productivity of this system, but in 1982 the swamp was to be drained for development.[44]

Maintaining swamps is vital to the productivity of whitebait fisheries. Vast areas of lowland fisheries have been lost to land clearance, drainage, and trampling by stock.

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38. McDowall, *The Whitebait Book*, p 122
39. *Neochanna apoda*, brown mudfish; *Neochanna burrowsius*, Canterbury mudfish; *Neochanna diversis*, black mudfish.
40. J W Phillipps, *The Fishes of New Zealand*, New Plymouth, Avery, 1940
41. G A Eldon, 'Breeding, Growth, and Aestivation of the Canterbury Mudfish', in *New Zealand Journal of Marine and Freshwater Research*, vol 13, no 3, 1979, pp 331–346
42. McDowall, *Natural History*, p 142
43. McDowall, *Natural History*, pp 142, 143, 151
44. I Buchanan, 'Eastern Lake Wairarapa – A Wetland Under Threat', in *Freshwater Catch*, vol 15, 1982, pp 20–22; McDowall, *The Whitebait Book*, pp 122–123

7.9 Loss of Harvest Due to Pine Forestry Practices

When pine forests replace native forests they create a new environment around streams. Their shade is darker and less dappled, their variety of vegetation is narrower, and the chemical composition of their leaf litter is toxic. In contrast to most native forests, mature pine forests characteristically have a sparse undergrowth. The intense shade from pine forests can prevent the growth of stabilising vegetation along stream banks, which are then easily eroded and this results in a wide, shallow, and silted stream bed.[45] The dense shade of a pine plantation creates a different quality of light from native forest. As pine plantations mature and are felled, extremes of light exposure and light reduction occur, and many native fish disappear. Pine plantation has not provided a substitute for native forest cover:

> These changes in light intensities can have profound effects on the stream flora and fauna . . . The galaxiids *Galaxias fasciatus* [banded kookopu] and *G postvectis* [shortjawed kookopu] are probably less common than before the clearance of lowland forests, since they are usually found in forest streams . . . *Galaxias postvectis* is probably very sensitive to removal of bush cover and stream modification . . . *Galaxias brevipinnis* [koaro] is usually found in streams which are heavily overgrown with bush, and it may form dense populations in streams unmodified by clearing of the forest . . . *Galaxias fasciatus* is typically found in stable streams which possess good pools or abundant shelter and are more or less completely overhung by trees, and particularly undisturbed native bush.[46]

Some native fish depend on particular kinds of stream-bank vegetation for successful spawning, which a bed of pine needles does not replicate.

Inanga, *Galaxias maculatus,* usually spawns among fairly long, thickly growing grasses. During the 1930s Captain Hayes advised the Marine Department that exotic deciduous trees 'render the ground beneath them unsuitable for the herbage which is necessary to afford cover for the spawn'.[47]

The brown mudfish, *Neochanna apoda*, 'has been observed to deposit its eggs above the waterline in captivity. These eggs dehydrate unless kept moist and therefore in the normal habitat suitable terrestrial vegetation may be necessary for the survival and development of the eggs.'[48] Maori in Northland recognise the intricate mesh of conditions for the wellbeing of native fauna, observing that there is a life-cycle connection between landsnails and the kokopu.[49]

Forestry practices of burning, bulldozing, roadbuilding, and hauling modify the physical structure of streams. Rapids, riffles, flats, shallow gravels, deep pools, and overhanging banks provide the habitats in which native fish forage, hide, and breed.

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45. Morgan and Graynoth, p 11
46. Morgan and Graynoth, pp 17–18
47. McDowall, *The Whitebait Book*, pp 18, 183, citing Marine Department files
48. McDowall, *Natural History*, p 18
49. Personal observation, 1987. Possibly, both lay their eggs in the same habitat.

Forestry practices disturb stream banks and stream beds, and load stream flows with sediment.[50]

Forestry practices disrupt nutrient cycles and alter the chemical composition of streams as slashed vegetation rots, as phosphorus, nitrogen, and potash enter streams after burning, as forests are sprayed with chemicals and fertilisers, as mills discharge effluents, as toxins leach out of sawdust and waste woods, as slime fungi suffocate the fauna.

Road building, logging, clear-felling, and burning usually increase soil erosion rates and may lead to exceptional amounts of sediment entering streams, with consequent depletion in oxygen and fatalities to both fish and their food organisms. Lampreys commonly lay their eggs in coarse gravel nests; common smelt spawn behind sandy riffles in the stream bed; and whitebait spawn among stream bank vegetation. Silt covering spawning grounds limits the survival of ova and fry of many native fish, decreases their customary foods, and destroys their habitat: 'Large increases in bedload due to logging may be expected to decrease the abundance of certain Galaxiidae [kokopu, and so on], Eleotridae [mudfish], and Anguillidae [eels], which favour stable stream beds'.[51]

Burning may directly heat stream water, resulting in death of aquatic fauna. A sudden increase in temperature to 17 or 20 degrees celsius would kill koaro.[52]

The effects of logging on stream sediment loads were known to the New Zealand Forest Service by the 1940s. Advice to the Crown on proper road construction, logging methods, and leaving riparian strips to reduce the sedimentation of stream gravels began in the 1950s.[53]

In 1978, Morgan and Graynoth voiced the growing concern over the effects of forestry practices on the native freshwater fish fauna. They repeated again and again that adequate studies of forestry practices on New Zealand native fauna had not been undertaken.[54]

7.10 Loss of Harvest Due to Unprotected Riparian Zones and Marginal Strips

Waikato, Mokau, Manawatu, and Clutha are sluggish, lowland rivers which fish follow for 30 to 40 kilometres upstream. Protection of margins is vital to inanga,

50. During the 1970s global studies of forestry practices documented stream disturbance. In 1978, Morgan and Graynoth reviewed international literature for the New Zealand Forest Research Institute. In one study 'scouring, canalisation, and siltation caused by forestry operations reduced the area of spawning gravels by 56 percent and 100 percent' (Morgan and Graynoth, p 15).
51. Morgan and Graynoth, pp 9, 11, 12, 13, 16
52. Ibid, p 19
53. An American study published in 1948 by Lieberman and Hoover, 'Protecting Quality of Streamflow by Better Logging' was quoted in a Forest Research Institute report to the New Zealand Forest Service (no 65). The report was not released. Another report by Lieberman and Hoover, also in 1948, 'Uncontrolled Logging Damages Water Quality', was cited in *Forestry Abstracts 10*, no 893 (Morgan and Graynoth, p 10).
54. Morgan and Graynoth, pp 5, 7, 9, 12, 13, 15, 16, 17, 20, 22, 24

common bully, and shortfin eels. Clear-flowing inland rivers with gravels and boulders, where swift flows alternate with pools, support inanga, bullies, torrentfish, juvenile and adult longfin eels. All these species require stream bank vegetation or instream cover such as logs and boulder heaps. In swamps, maintaining abundant native vegetation along margins is vital to shortfin eels and giant kokopu.

Banded kokopu are economically important to Maori, as part of the whitebait catch. When streams flood and over-run their banks, banded kokopu spawn in forest litter on stream banks and in sedges on stream deltas. The eggs are deposited well above normal stream levels.

Inanga, also part of the whitebait catch, spawn on spring tides, amongst vegetation on estuarine banks. Damage to whitebait spawning grounds is a significant factor in whitebait declines. During the 1930s, Captain Hayes advised the Marine Department that 'the trampling of grazing stock and the annihilation of possible spawning-grounds as the result of grazing have been found to occur in practically all the localities investigated'.[55]

7.11 LOSS OF HARVEST DUE TO DAM CONSTRUCTIONS

Between 1850 and 1937, just in the kauri forests of the Coromandel peninsula and other northern areas alone, about 3000 massive wooden dams were built across small streams.[56] After heavy rain, the dams were released and thousands of logs tumbled downstream to the sawmill booms. In the process, banks lost protective vegetation and stream beds were often scoured down to rock bottom, destroying foraging resources, hiding places, spawning gravels, and habitats of freshwater fauna. These dams were short-lived.[57]

During the twentieth century, many of the larger rivers have been impounded by hydro-electric dams. These permanent impoundments have changed upstream waters from riverine into lacustrine environments, and have prevented much of the upstream movement of migratory fishes. In attempting to climb the dams fish may become exhausted, to the extent that survival is reduced, and spawning may be delayed, resulting in high ova and fry mortalities because the opportunity of suitable environmental conditions have been missed.[58] Hydro dams impassable to homing fish deny access to spawning grounds. Hydro lakes inundate spawning streams.[59]

Koaro and common bully have survived as landlocked populations. However, introduced brown trout have also established landlocked populations above dams,

55. McDowall, *Natural History*, pp 98, 466; McDowall, *The Whitebait Book*, p 183, citing Marine Department files
56. T E Simpson, *Kauri to Radiata: Origin and Expansion of the Timber Industry of New Zealand*, Auckland, Hodder and Stoughton, 1973
57. Morgan and Graynoth, p 14
58. Ibid
59. Dinamani and Hickman, p 9

where they are predatory on koaro and other native fish. The construction of dams has land-locked populations of common smelt (*Retropinna retropinna*) in lakes where they have successfully displaced koaro from the surface waters of the lake, possibly because smelt compete with koaro for zooplankton.[60]

The Wairehu canal was constructed to divert water down from the upper Whanganui River system into Lake Taupo. To prevent fish migrating upstream, out of Lake Rotoaira and into the diversion canal, a velocity barrier was constructed. During spring and summer, koaro achieve their upstream migration by avoiding the forceful sheet of water and climbing along the damp, vertical concrete walls in the splash zone above the flow of water. They grip with the surface of their fins which, unusually, face downwards. By this long and slow journey they reach the gently flowing water of the diversion canal. Their urge to migrate upstream, and their negotiation of obstacles, 'verges on the incredible'.[61]

Where a dam is kept moist, some longfin eels, koaro, banded kokopu, shortjawed kokopu, and redfinned bully make their way upstream 'past formidable barriers', but many become exhausted or die in the attempt, and populations above dams are probably much reduced. Dams are preventing longfin eels from returning to Wanaka and Ohau lakes. Bluegilled bully, shortjawed kokopu, and eels cannot maintain populations in landlocked waters; eels are very longlived, but will die out above dams.[62]

Elvers are able to make their way up the walls of the hydro dam on the Arnold River below Lake Brunner, climbing 14 metres; up the Karapiro dam on the Waikato River, climbing 30 metres; up the Arapuni dam on the Waikato River, climbing 43 metres; and up the Waitaki dam on the Waitaki River, climbing 21 metres. In 1956 elvers were described climbing the Karapiro dam:

> We saw young eels from three to five inches long – literally millions, trying to climb up the spillway of the dam – they must have climbed sheer rock and we saw thousands that had perished in the dust on the temporary bridge facing the spillway.[63]

By 1980 there had been only two attempts, both unsuccessful, to provide fishways or fish ladders at hydro dams:

> In any country where hydro-electric power and irrigation are planned by non-government agencies they would be forced by law to provide fish hatcheries, fish-ways, stream improvement, and other ways of restoring the habitat of fish disturbed by the hydro or irrigation schemes. In New Zealand these schemes have been planned by government which also has had the responsibility for managing the fisheries, but which did not impose habitat restoration on itself.[64]

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60. McDowall, *Natural History*, pp 113, 466
61. E J Cudby, personal communication, in McDowall, *Natural History*, pp 110, 111
62. McDowall, *Natural History*, pp 332, 333, 493
63. D H Graham, *A Treasury of New Zealand Fishes*, Wellington, Reed, 2nd ed. 'The climbing ability of eels provides a simple method of constructing fish passes to allow eels to migrate upstream past dams . . . In recent years a system using a large 'bottle-brush' inside a PVC tube . . . was successfully constructed on the face of the dam on the Patea River to a height of 75 m' (McDowall, *Natural History*, p 55).
64. Dinamani and Hickman, p 44

7.12 Loss of Harvest Due to Culverts

Native fish migrating upstream get past swift and turbulent falls typically not by jumping (as salmonids do), but by climbing. As streams deepen their beds, a disparity develops between the height of the culvert and the stream bed; small fish cannot make the leap up into the culvert to continue their migrations into feeding grounds and protective habitats. Where the migrating shoals do enter a culvert, there is another barrier: culverts made of cylindrical concrete pipes and placed in streams create a sheet of water passing over a smooth surface; small fish do not have the strength to swim for long against this current without ledges to rest in. 'There are probably thousands of kilometers of small streams to which access by fish is prevented by careless and unknowingly damaging construction of culverts'.[65]

7.13 Loss of Harvest Due to Modifying Estuaries

After hatching, many native fish are washed out to sea, where they spend about five months of the winter growing on the richer food supplies that the ocean provides. They then migrate into freshwater streams, possibly to escape marine predators, and possibly locating their natal streams by the smell of the water. Glass eels move into estuaries where they settle and may be found in huge numbers in the mud and sand or under stones. Adult eels also inhabit estuaries, usually skulking beneath undercut banks, logs, or other cover.[66] Estuaries provide a transitional habitat which reduces the shock to migrating fish of changing from fresh water to salt water.[67]

Seventeen species of native fish pass through estuaries. Estuaries polluted by oil and discharges from ship's engines; disturbed by jet boats and water skiing; and estuary expanses limited by marinas and tip reclamations, greatly reduce the numbers of small fish which survive the transition.

After reaching maturity in the headwaters of streams, some native fish return to estuaries to spawn. Margins of estuaries at and just above high tide mark are vital to the spawning of inanga. McDowall noted the 'extensive decline in whitebait catches in most parts of New Zealand', and attributed this to removal of forest, draining of swamps, and degradation of river estuaries, as being prime causes of decline.[68]

Thus estuaries are places where small fish congregate in thousands, where they are most intensely predated by birds and humans, where the abundance of the next generation is determined. If spawning is delayed by disturbance or blocked passage, high ova and fry mortalities may result because of unsuitable environmental conditions.[69]

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65. McDowall, *Natural History*, p 493
66. McDowall, *The Whitebait Book*, p 24
67. Dinamani and Hickman, p 44
68. McDowall, *Natural History*, p 434
69. Morgan and Graynoth, p 14

7.14 Loss of Harvest Due to Game Fish Introductions

There are very few New Zealand waters that do not carry stocks of brown trout. Some brown trout go downstream to the sea, where they wander quite widely, and after introduction in 1867, brown trout colonised many streams on their own initiative.[70] Brown trout compete with native fish for territory and food; and they consume eggs and juveniles of native fish, especially at river mouths as the small fish migrate in from the sea.[71]

Following the introduction of rainbow trout in the 1880s, a policy of stocking New Zealand lakes and rivers was pursued vigorously and it now forms the basis for 'important and valuable recreational fisheries'. In some lakes where rainbow trout do not spawn, stocks have been maintained by acclimatisation societies and fish and game councils, through hatchery releases: for example Lakes Tarawera, Otomangakau, Okaro, Tikitapu, Ngapouri, Okataina, Rotoma; and rivers and lakes of Northland.[72]

Rainbow trout are carnivorous. In lakes they feed at the surface on floating insects and small fish. When first introduced, they depleted populations of native koaro. They now feed mainly on the native common smelt, *Retropinna retropinna*, which was introduced into some water systems by acclimatisation societies specifically to support recreational trout fisheries. Rainbow trout also feed at the bottom on native common bullies (*Gobiomorphus cotidianus*), and on native koura (*Paranephrops planifrons*).[73]

Some native fish are continuing to survive in habitat dominated by trout, but are extensively preyed on by the trout: bullies, common smelt, Stokell's smelt, young eels, lampreys, and torrentfish. In the 1960s rainbow trout were introduced to the Dargaville lakes (Northland), which were habitats of the dwarf inanga (*Galaxias gracilis*). In Lake Waingata there was a rapid decline in dwarf inanga, koura, and crab; in Lake Taharoa dwarf inanga are now rare. The giant kokopu has disappeared from areas now occupied by brown trout. The dwarf galaxias retreats into hill streams, where it inhabits localities above barriers to the upstream migration of brown trout. The common river galaxias of Canterbury rivers seems to survive where it has habitat above the reach of brown trout. Mudfishes are seldom found in habitats accessible to brown trout.

In lakes and rivers trout compete with native fish for floating insects, aquatic larvae (especially dragonfly nymphs, fly, caddis, mayfly, and stonefly larvae), and native aquatic snails and molluscs, especially in winter when food sources are

70. Brown trout, *Salmo trutta*, is a native of Europe, Iceland, Scandinavia, and north Africa. It was one of the first game fishes introduced into New Zealand waters, in 1867. Brown trout are currently found in most river systems south of Coromandel, often much more abundantly than is evident; not found in the Chatham islands and in Stewart Island (McDowall, *Natural History*, pp 466–467). In 1990 there were 20 introduced species of fish, including seven predatory salmonids.

71. McDowall, *Natural History*, pp 167, 466–467

72. Rainbow trout, *Oncorhunchus mykiss*, is a native of North America (the Pacific coast from Alaska to Mexico). It is now established in inland waters south of the Waikato River system, and in most upland and alpine lakes and many rivers (McDowall, *Natural History*, pp 186, 188).

73. McDowall, *Natural History*, pp 466–467

meagre. Small longfinned eels living amongst the river gravels feed on aquatic larvae (caddis and mayfly), snails, and midges; their food is so similar to those of trout that competition is likely.[74]

The impact of trout on native fish was quickly observed and was the subject of much public discussion from the 1890s on.

7.15 Loss of Harvest Due to Smelt Introductions

From 1907 on, a native fish, common smelt (*Retropinna retropinna*) was progressively released into lakes by acclimatisation societies as food for the trout they had introduced. From 1905 to 1974 the releases were to a substantial number of lakes in diverse parts of New Zealand.[75]

Fisheries inspectors allowed the transfers of smelt because the Crown gave priority to interests in game fish, ahead of the economic interests of Maori in koaro, a fish Maori at that time preferred. Although this was known in 1921, introductions of smelt into lakes with koaro populations continued into the 1970s.[76]

McDowall has suggested that 'failure of the koaro populations to recover in lakes like Taupo is because the smelt populations have occupied the habitat that originally belonged to the koaro whitebait'.[77]

7.16 Loss of Harvest Due to Course Fish Introductions

Up to 1990 the impact of recently introduced course fish had not been studied and critical data on which the Crown might intervene, had not been collected. McDowall commented:

> In the lower Waikato eel fishermen have expressed concern that the spread and increased abundance of catfish are depressing the eel populations. Mosquito fish are often described as aggressive, fin-nipping and egg-eating predators. Their increasingly widespread occurrence could be a cause for concern with regard to the black mudfish, which is already much reduced in range. The recent establishment of koi carp in the lower Waikato, with its known propensity for severe habitat disruption, is a matter for serious concern . . . The escape of grass carp into the lower Waikato could have harmful consequences.[78]

74. McDowall, *Natural History*, p 194
75. Ibid, pp 69–71
76. Te Rangi Hiroa (P Buck), 'Maori food supplies of Lake Rotorua, With Methods of Obtaining Them, and Usages and Customs Appertaining thereto', in *Transactions and Proceedings of the New Zealand Institute*, vol 53, pp 433–451
77. McDowall, *The Whitebait Book*, p 175
78. McDowall, *Natural History*, p 468

7.17 Loss of Harvest Due to Vermin Destruction Campaigns

Acclimatisation societies had begun to form by the 1860s. Membership included Prime Ministers, ministers of the Crown, members of Parliament, provincial superintendents and councillors, mayors, judges, lawyers, newspaper editors, merchants, landowners, and scientists. 'The acclimatisation societies were, from the outset, of high social and political importance in the colony. Lists of people involved in either stimulating formation of societies or as members of their founding councils were a 'who's who' of colonial New Zealand of the time'. As McDowall commented: 'No other agencies in New Zealand have ever been to the same extent self-regulating in a statutory sense, with such minimal government oversight', nor elected by such an 'exclusive user group' who are the sportsmen 'controlling the management of the resources they exploited'.[79]

The acclimatisation societies were funded from grants made by provincial and colonial governments, from membership fees of hunters and anglers, and from licences for hunting both introduced and indigenous fauna. Initially licences were sold by Government agencies (Collector of Customs, Post Offices). The acclimatisation societies objected, and from around the 1920s to 1990 the Societies 'assumed total control over licences sales and the revenue from them'.[80]

In 1966 the New Zealand Fish and Wildlife Investigation Movement advised that freshwater fisheries and wildlife were being unwisely managed, and were gravely threatened by land use, industrial development, and intensive settlement. In 1968 Burnet published his findings that eels were not detrimental to trout stocks.[81] The Hunn Commission investigated freshwater fisheries in 1968. The acclimatisation societies opposed the commission's recommendations, and none was instituted.[82]

79. Early members of the Auckland Acclimatisation Society were Thomas Gillies, lawyer, politician, later judge of the supreme court; Frederick Hutton, Auckland provincial geologist; Albin Martin, Provincial Councillor; Richard Ridings, Provincial Councillor. Later members were Thomas Kirk, botanist, secretary of the Auckland Institute, curator of the Auckland Museum, and later chief inspector of forests; Thomas Cheeseman, botanist, secretary of the Auckland Institute. Early members of the Wanganui Acclimatisation Society were Richard Taylor, missionary; Walter Buller, ornithologist, magistrate; John Ballance, Premier. Early members of the Nelson Acclimatisation Society were Charles Elliot, Nelson Provincial Councillor; Edward Stafford, Superintendent of the Nelson Province, later Premier; John Robinson, Nelson Superintendent; David Munro, later speaker of the House of Representatives. Early members of the Canterbury Acclimatisation Society were Julius von Haast, geologist, later director of the Canterbury Museum; Archdeacon Mathias; John Cracroft-Wilson, Canterbury Provincial Councillor, later member of Parliament; William Travers, naturalist, member of Parliament; Thomas Potts, naturalist, later member of Parliament; Samuel Bealey, Provincial Superintendent. Early members of the Otago Acclimatisation Society were James Hector, Otago provincial geologist, later founder of the New Zealand Institute, chancellor of the University of New Zealand; Julius Vogel, Superintendent of the the Otago Province, later Premier. First president of the Southland Acclimatisation Society was John Taylor, superintendent of the Southland Province. Early members of the Hawke's Bay Acclimatisation Society were Donald McLean, Provincial Superintendent and member of Parliament, later Native Secretary; John Ormond, Provincial Councillor, later Superintendent of Hawke's Bay Province, member of Parliament, member of the Legislative Council; Thomas Tanner, Provincial Councillor, member of Parliament. Early members of the Wellington Acclimatisation Society were James Hector (above); Alfred de Bathe Brandon, Provincial Solicitor; John Plimmer, Provincial Councillor; C H Izard, City Councillor; Jonas Woodward, Provincial Councillor. Governor George Grey was patron of the Otago and Southland Acclimatisation Societies (R M McDowall, *Gamekeepers for the Nation: The Story of New Zealand's Acclimatisation Societies*, Christchurch, Canterbury University Press, 1994, pp 18–23, 32).

The Waitangi Tribunal was advised in 1988 that acclimatisation societies were 'akin to local government, discharging a statutory role'.[83] McDowall confirms that the societies carried out on behalf of Government a:

> significant enforcement and statutory role . . . considerable sums of public money were given by the colonial and provincial governments to support society work in introducing and establishing species brought here . . . the country as a whole must accept much responsiblity for bad decisions, and for damage which has ensued and which is now regretted.[84]

The right of acclimatisation societies to kill indigenous fauna in order to protect introduced game and game fish was claimed under the absence of protection provided in the Protection of Animals Act 1861, 1865, and in the Salmon and Trout Act 1867, and thereafter under the schedules of the Animals Protection Acts 1867–1922, the Wildlife Act 1953, and the Fisheries Act 1983. From 1866 to 1968, acclimatisation societies paid a bounty on native fauna predatory on introduced game. Kingfishers, gulls, wekas, and moreporks were briefly eradicated. Eels, shags, and hawks were killed as vermin for 100 years, from the 1860s to the 1970s. To Maori as at 1840, tuna (eels) were an economic staple. Kotare (kingfishers) were an economic resource for some hapu, harvested as young. Ruru (morepork) were an economic resource for some hapu, preserved and presented ceremonially, and an omen for others. Kawau (shags) were an economic resource for some hapu, the young harvested at named shaggeries, and proverbially respected by others. Weka were an economic resource and proverbially respected. Kahu (hawk) were an economic resource and respected in myths and proverbs. Karoro (seagulls) were tamed and tethered in kumara gardens to eat caterpillars.[85]

Campaigns of eel destruction, in order to protect stocks of trout, had begun by 1903, sponsored by both acclimatisation societies and Government departments. In 1928 'a heap of dead eels' was displayed on the Waitaki River bank as a result of an acclimatisation society extermination campaign, and in 1933 an acclimatisation society ranger advised, 'Where infestation is bad it is possible to wade up a stream beheading the eels in one's stride'. In 1930, A E Hefford, Chief Inspector of Fisheries, expressed reservations about the policy then being proposed of exterminating eels from waterways. None the less, in 1948 the Public Works Department destroyed 2000 mature eels in one night as they crossed a dam, on their seaward migration to spawn.

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80. McDowall, *Gamekeepers for the Nation*, pp 65, 68
81. A M R Burnet, *A Study of the Relationships Between Brown Trout and Eels in a New Zealand Stream*, New Zeland Marine Department, Fisheries Technical Report, no 26, 1968
82. McDowall, *Gamekeepers for the Nation*, p 123
83. McDowall, *Gamekeepers for the Nation*, citing W B Johnson
84. McDowall, *Gamekeepers for the Nation*, p 36. In 1990 acclimatisation societies became fish and game councils.
85. Elsdon Best, *Forest Lore of the Maori*, Wellington, Government Printer, 1942, pp 175–178, 330–337, 343–344, 352

In 1963, Max Burnet, Marine Department scientist, demonstrated that trout attain larger size, though fewer in number, when sharing territory with eels.[86] None the less, campaigns of eel destruction continued into the 1970s. Acclimatisation societies had paid a bounty on eels over 10 pounds, and through this policy large eels were specially targeted in extermination campaigns. As eels grow slowly, occasionally living to 60 years, the long-term effects of the policy are becoming apparent. Since 1975, eel captures for export have been declining.[87]

Campaigns of shag destruction, to protect stocks of trout, had begun by 1875. In 1890, the Otago Acclimatisation Society called for a 'more determined onslaught' and by 1904 it was paying a bounty on shags. In 1915, the ornithologist Edgar Stead advised that only one species, the large black shag, preyed on trout, and in 1929 he again advised that shooting of shags was not justified. In 1926, the ornithologists Guthrie-Smith and Stead further advised that shags did more good than harm. None the less, in 1927, the Auckland Acclimatisation Society reported 1500 shags shot on Lake Waikare alone. In 1932, the ornithologist Robert Falla recommended complete protection for the spotted shag and blue shag; in 1941, the little black shag was protected by statute. In 1982, seasonal protection for the black shag was sought to counter its continuing destruction by shooters. For 100 years, acclimatisation societies had paid bounties on shags, conducted annual shooting expeditions to destroy shaggeries during the breeding season, and destroyed nests. Society staff, local councillors, anglers, and shooters participated in these campaigns.[88]

Campaigns of native hawk destruction, to protect introduced pheasants and quail, had begun by 1867, when the (North) Canterbury Acclimatisation Society reported paying bounties on 659 native harrier hawks, and the Auckland Society on 659 hawks. In 1915, the Minister of Internal Affairs protected the native harrier hawk, but opposition from acclimatisation societies prevailed. 'From these beginnings developed perhaps the most extraordinary war, ever, upon any of New Zealand's supposed vermin populations'. Between 1922 and 1942 the Auckland Society paid bounties on nearly a quarter of a million native hawks; during 1946 to 1949 the South Island vermin control board's tally exceeded 53,000 hawks. Campaigns against native hawks continued to 1959.

In 1979, the Wildlife Service declined the native hawk protection. From 1982 to 1996 it received protection during the duck shooting season only.[89]

The extermination campaigns proceeded without research into relationships between game and predators. In 1977, after a hundred years of eradication campaigns against eels, the Nelson Acclimatisation Society advised that there was 'not clear evidence that a moderate eel population has a detrimental effect on an established trout population'.[90]

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86. A M R Burnet, *A Study of the Inter-relation Between Eels and Trout*, New Zealand Marine Department, Fisheries Technical Report, no 36, 1969
87. McDowall, *Gamekeepers for the Nation*, pp 120–124
88. Ibid, pp 117, 124–128
89. Ibid, pp 116, 128–130
90. Ibid, p 124

7.18 LOSS OF HARVEST DUE TO SQUANDERING AND OVEREXPLOITATION

Maori ethos in regard to exploitation of wild life is proverbially 'We do not fish to kill fish, we fish for food'.[91]

In 1899 Clarke commented that it was 'piteous . . . to see the enormous quantities of [unwanted] young grayling (upokororo) which were destroyed' as a result of capture by West Coast whitebaiters, and he also noted that 'often I have seen the surface of the Chinamen's gardens . . . for several acres each in extent covered some inches in depth with [whitebait] fry used as topdressing manure'.[92] In 1928, Hope expressed concern at the decline in whitebait catches, at over-exploitation, and at lack of action from the Government: 'Commercial interests were ruling the whitebait industry'.[93] In 1984, McDowall noted that the migrating young of the blue-gilled bully are known to whitebaiters on the West Coast as 'whalefeed' or 'Dan Doolin spawn'. 'They are occasionally caught by whitebaiters in very large numbers, but are not regarded as of any food or fisheries value'.[94]

During the extermination campaigns conducted by the acclimatisation societies, hundreds of thousands of eels had been eradicated and buried in the ground, or exposed in heaps on river banks, or electrocuted at dams.

7.19 LOSS OF HARVEST DUE TO LACK OF RESEARCH

Fisheries scientists have been outspoken on the neglect of research that would ensure good management of the resource. In 1922, the Chief Inspector of Fisheries, A E Hefford, held the view that the whitebait fishing regulations 'made in the past have been mainly for the purpose of adjusting matters between competing fishermen rather than from the point of view of conservation of the stock'.[95]

In 1941, the naturalist Gerald Stokell voiced concern at the absence of conservation policy for indigenous freshwater fish: 'the native fishes except those that are of economic value and subject to fisheries regulations are entirely unprotected'. He urged 'the cessation of chaotic and blindfold fishery control'.[96]

In 1966, the New Zealand Fish and Wildlife Investigation Movement noted that freshwater fisheries and wildlife were being managed without sound research data.[97] Marine Department research into the migrations of whitebait did not begin until 1968.[98]

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91. *Report of the Seminar on Fisheries for Maori Leaders*, Auckland, University of Auckland, Centre for Continuing Education, 1976
92. Clarke, 'Notes on New Zealand *Galaxidae*', pp 78–91
93. *The Press*, 5 September 1928; McDowall, *The Whitebait Book*, p 185
94. Strickland found no record of Maori names for blue-gilled bully. It is distinctive in occupying swiftly flowing waters along with the torrentfish, and in penetrating further upstream than most other fish (McDowall, *Natural History*, pp 304, 307).
95. McDowall, *The Whitebait Book*, p 130, quoting Marine Department files
96. G Stockell, *Wild Life Control. Defects in Present Scheme Exposed. Some Constructive Suggestions*, Wellington, Blundell, 1941
97. McDowall, *Gamekeepers for the Nation*, pp 405–406
98. McDowall, *The Whitebait Book*, p 72

Introductions of exotic fish began in 1860s and continued for a hundred years before Government scientists began research on their impact on the native fauna. In 1990, McDowall noted, 'Even now, in spite of greatly increased research effort, there has been only minimal explicit study of the relationship between the indigenous and exotic fish faunas'.[99] In 1991, McDowall commented:

> So little is known [about the life cycles of the five white bait species] that biologically based management of the fishery and its species is impossible . . . Nothing is known about how they live [at sea] . . . how they disperse at sea, or how they navigate back to fresh waters . . . Absolutely nothing is known about levels of escapement from the fishery . . . In short, managers of the fishery have never had much idea how much fish was caught. There has never been any ability to relate catches to populations, to estimate the impact of fishing on the stocks, or any of the other, fundamental parameters/measures that would be required if the fishery was to be managed on sound, biologically based principles. Management has always been a hit and miss, ad hoc affair.[100]

In summary, Maori had rigorous practices for preventing pollution of waters, and for placing protection over vulnerable stocks; a complex knowledge-base prevented inadvertent destruction of crucial habitat; the technology was productive while enabling stocks to rebuild. The Crown did not require agricultural and industrial practices to match the standards set by Maori and during the nineteenth and twentieth centuries the economy of colonial settlement was established at the expense of the faunal abundance which Maori had harvested over many centuries as the self-sustaining basis of their forest-river economy.

Since the claim was lodged in 1991, Government has signed international legislation moving wildlife resources further from Maori control; the Department of Conservation has directed its habitat protection to offshore refuges; indigenous forests are on the edge of sudden decline; and elders who can retrieve knowledge of an interactive natural world may be the last generation. Statutes have been manipulated to support the interests of mining companies; regional bodies have granted discretionary resource use permits to agriculture, forestry, industry, and urban development; Government has committed the country to international agreements; medical legislation has excluded the exercise of Maori knowledge; and resource legislation has excluded the exercise of Maori management. Many of these decisions were made by bodies whose members were themselves the interested parties. Advice from New Zealand scientists at the Department of Scientific and Industrial Research and at the National Institute of Water and Atmosphere that remaining forests, wetlands, and mangrove swamps – as nurseries for wildlife – would provide a greater economic return per hectare than agriculture and pine forestry, have gone largely unheeded. Yet with combined public will, the loss of harvest is in some measure recoverable:

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99. McDowall, *Natural History*, p 461

100. R M McDowall, *Conservation and Management of the Whitebait Fishery*, Wellington, Department of Conservation, Science and Research Series, no 38, 1991, pp 4–9

Queen Victoria proclaimed protection to riparian zones by defining the 'Queens chain' so that access through private land would be maintained. These are now called 'marginal strips', linear stretches of public land that sometimes extend across the lowlands linking the mountains and the sea. Sadly, despite widespread public belief in the 'Queens chain', it has largely been ignored. Nevertheless, the impact has been to encourage rivers as boundary markers so that multiple ownership is characteristic. This means that no single owner dominates the riparian zones of larger rivers and therefore community interest is an underlying factor in overall management. For all these natural and cultural reasons, the riverbanks of New Zealand offer an unexcelled potential for ecological restoration.[101]

101. P Simpson, *Ecological Restoration in the Wellington Conservancy*, Wellington, New Zealand Department of Conservation, 1996

CHAPTER 8

CONCLUSION

The claim has wide implications. Forests and freshwater fisheries were harvested by hapu in year-round succession. Schools of migrating eels and lampreys passed through massive weirs built to withstand river floods. Rats following ridge-line tracks fell into pit-fall traps. Birds were snared as they flocked to crops of ripe berries. Edible ferns were husbanded by rotational gathering. Thus, in 1840, hapu had a body of knowledge and skills that enabled them to celebrate life with the surplus abundance they harvested from the indigenous forests and fisheries. With colonisation, resources that hapu had valued for their particular natural abundance were not reserved; forested lands were confiscated, cleared, and replanted in pasture grasses; timber on Maori land was cut illegally; forests were fragmented and died back; wetlands were drained; introduced animals destroyed forest regeneration and preyed on wildlife; introduced fish occupied the territory of native fish; introduced plants occupied the habitats of indigenous plants; milling, mining, forestry, and factory effluents poisoned waterways; acclimatisation societies ran campaigns of extermination against native wildlife. In large part, the economy introduced by settlers burnt, destroyed, and replaced the indigenous flora and fauna.

The loss of whenua through confiscations, denial of promised reserves, miscalculation of boundaries, debtor sales, and willing participation in a global economy, has been researched as a loss of agricultural soils, settlements, and burial grounds. But the loss of whenua is much greater than this. It is also a loss of forests and fisheries which were husbanded by Maori as an independent, self-sustaining, debt-free economy; as the source of festivals, wealth, and curative medicines; as the inspiration of trapping techniques, technical vocabulary, songs, and narratives; as the realm of ancestors and spiritual wellbeing. Through loss of flora and fauna the hapu lost a self-sustaining economic base and its harvestable abundance, trapping techniques and knowledge-base; with legislation against healers went loss of medical practices and loss of wellbeing; with disparagement of Maori classification of the flora and fauna went exclusion of much Maori knowledge from research and development funding, from schools of biological and physical sciences, and from resource management policy.

Maori are striving to participate in the national economy and to modify it so that it sustains the wellbeing of the indigenous people; and at the same time to repossess and restore some part of their whenua. Through this claim Maori are seeking to regain the prosperous duality of skills and resources they had achieved in 1840.

GLOSSARY

In this report, Maori names have been used as 'standard common names' to avoid the complexities of dialect variations and of settler adoptions. For example in this report, 'kokopu' are always whitebait species (*Galaxias* spp), although in settler accounts 'kokopu' are often bullies (*Gobiomorphus* spp). Mud fish in this report are always called 'waikaka', 'water-cunning', although some accounts originate from areas where mudfish are called hauhau.

Ariki: chief whose sacred rank derives from the senior line of descent
Banded kokopu: a whitebait species, *Galaxias fasciatus*
Bittern: matuku hurepo, *Botaurus poiciloptilus*
Black shag: kawau, *Phalacrocorax carbo*
Bully: *Gobiomorphus* spp
Bush hawk: karewarewa, *Falco novaeseelandiae*, New Zealand falcon
Cabbage tree: *Cordyline* spp. (Ti pore, *Cordyline fruticosa*) was cultivated.
Cockabully, 'kokopu': *Tripterygion nigripenne*. Some settlers equated 'cockabully' with which are *Galaxias* spp.
Common smelt: *Retropinna retropinna*
Dock: paewhenua, *Rumex flexuosus*, Maori dock (native); *Rumex* spp, common dock (introduced)
Dwarf inanga: Galaxias gracilis
Fern root: commonly aruhe, *Pteridium esculentum*, bracken fern. A highly prized fern root, para taniwha, *Marattia salicina*, king fern, was harvested from forested valley floors.
Flax: harakeke, *Phormium tenax*
Giant kokopu: a whitebait species, *Galaxias argenteus*, 'Maori trout'
Godwit: see kuaka
Hapu: land-holding lineage, led by a rangatira
Harrier hawk: *Circus approximans*
Hinau: *Eleocarpus dentatus*
Hoko tahae: deceptive transaction
Huhu: grub, *Prionoplus reticularis*
Inanga: a whitebait species, *Galaxias maculatus*
Iwi: tribe; landholding groups allied through patrilineal descent
Kahikatea: *Podocarpus dacrydioides*
Kaitiaki: guardian, caretaker
Kaitiakitanga: [modern], stewardship
Kainga: property, comprising home and garden
Kaka: parrot, *Nestor* spp
Kakapo: parrot, *Strigops habroptilus*
Kakariki: parrot, *Cyanor hamphus* spp
karaka: *Corynocarpus laevigatus*
Karakia: chanted prayer
Kareao: supplejack, *Rhipogonum scandens*
Karoro: seagull
Kauri: *Agathis australis*
Kawakawa: *Macropiper excelsum*
Kereru: *Hemiphaga novaeseelandiae*
Kiekie: *Freycinetia banksii*

Kiore: Polynesian rat, *Rattus exulans*
Kiwi: *Apteryx* spp
Koaro: a whitebait species, often lake-locked, *Galaxias brevipinnis*, 'mountain trout'
Koha: offering given in advance of receiving a favour
Kokako: *Callaeas* spp
Kokopu: Maori trout, *Galaxias* spp (whitebait spp)
Kopakopa: plantain, *Plantago* spp
Koromiko: *Hebe* spp
Kowhangatara: *Spinifex hirsutus*, spinfex
Kuaka: bartailed godwit, *Limosa lapponica*
Maire: *Nestegis* spp
Maire tawake: *Eugenia maire*
Maori: indigenous, common
Matai: *Podocarpus spicatus*
Mauri: vital force of life-forms which seeks to return to well-being; from a Polynesian form, possibly *ma?uli. In some Polynesian societies it is a spiritual force transmitted through the women of the patrilineage who hold genealogical knowledge, have the power to curse, and act as midwives, thereby securing the well-being of their lineage.
Mokoroa: *Aenetus virescens*, puriri moth caterpillar
Mudfish: see waikaka
Muttonbird: oi, *Puffinus griseus*, sooty shearwater
Ngutara: *Wiseana* spp, porina caterpillar
Pakeha: fair-skinned
Papanoko: torrentfish, *Cheimarrichthys fosteri*
Piharau: lamprey, *Geotria australis*
Pipiwharauroa: shining cuckoo
Pukeko: *Porphyrio melanotus*
Pupu rangi: *Paryphanta* spp, kauri snail
Pupu harakeke: *Placostylus hongii*, flax snail
Puriri: *Vitex lucens*
Porokaiwhiri: *Hedycarya arborea*, pigeonwood
Putaputaweta: *Carpodetus serratus*
Rahui: prohibition on harvest or trespass
Rangatira: chief whose rank derives from leadership
Rakau rongoa: herbal medicines
Rata: shaman, healer, doctor
Rata: *Metrosideros* spp
Raupo: *Typha angustifolia*, bulrush
Rimu: *Dacrydium cupressinum*
Rauiri: latticed fence, eel-weir, reserve
Rongoa: traditional healing practices in which a part is played by decoctions prepared from flora and fauna with medicinal properties.
Rongoa rakau: medicinal plants
Shortjawed kokopu: a whitebait species, *Galaxias postvectis*
Spring eel: see waikaka
Taha hinengaro: mental aspect (heart and mind)
Taha kikokiko: physical aspect (body)
Taha wairua: spiritual aspect
Taha whanau: social aspect
Take: head as founder of a hapu or iwi
Tapu: restriction
Tautohe: contested
Tikanga rongoa: healing practices

Toheroa
Tohunga: expert, shaman
Totara: *Podocarpus totara*
Tui: *Prosthemadera novaeseelandiae*
Tuna: shortfin eel, *Anguilla australis*; longfin eel, *Anguilla dieffenbachii*.
Uruuruwhenua: secure title to land by ceremonial procedures
Utu: compensation
Upokororo: grayling, *Prototroctes oxyrhynchus*
Waikaka: spring eel, mudfish. Brown mudfish, *Neochanna apoda*; black mudfish, *Neochanna diverus*; Canterbury mudfish, *Neochanna burrowsius*
Wakawaka: boundary, division
Weka: *Galliruallus* spp
Weta: *Hemideina* spp (tree weta, bush weta)
Whanau: offspring
Whare wananga: institution for the teachings of the tohunga
Whenua: estate comprising land, forests, rivers, and people who cultivate the estate by right of descent or residence
Woodhen: see weka

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