

Kaimoana Survey 2000/2001

A collaboration between Fletcher Challenge Energy, Otaraua Hapu, Ngati Rahiri, Ngati Matunga and the Taranaki Regional Council.

Phase 1 : North Taranaki Coastal Seafood Resources – A Brief Historical Summary

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This report is a brief summary of the North Taranaki coastline based on the various surveys and studies which have been undertaken there over the past 20 years. It also contains a brief history of the area in terms of uses made of the coast, and influences and impacts on it. It is Phase 1 of a three-phase study.

The Iwi Perspective

It is not possible nor advisable for a non-maori to attempt to summarise here all of the history and knowledge of local maori and their use of kaimoana from the North Taranaki reefs and coastline – instead, let’s look briefly at what the Waitangi Tribunal heard and wrote when it reported on the claim by Te Atiawa in 1981/2 concerned with pollution of these reefs.

Most evidence given by hapu and maori individuals at the hearing was verbal (not written), and hence there is no detailed record of what was actually said (although tapes of the hearing do exist at the Waitangi Tribunal office in Wellington). A lot of the “technical” evidence (ie what seafoods were found where and in what densities) was only of a generalised, non-specific nature, and instead much of the evidence was more in the way of historical use, significance and value of seafoods and their use to local hapu, and cultural impacts associated with the discharge of wastes into the coastal area.

The pollution of Waitara reefs from the sewage outfall there ranked as very significant amongst those presenting evidence, and indeed many felt that the reefs had become more polluted (than by the river-borne wastes) since the marine outfall was installed (1978). Evidence was given of “sick mussels” on Orapa Reef, which were reported to be fragile and to crumble when walked on or even squeezed by hand. It was accepted by the Tribunal that a combination of coastal alignment and prevailing winds was responsible for driving Waitara sewage and wastes further east along the coast, even as far as Motunui.

With regard to the Motunui reefs, the Tribunal noted and indeed reinforced the statement made by the Tribunal, convened under the then National Development Act, which heard the applications for consents for the Synthetic Petrol plant. In that statement the significance of the reefs and associated seafood were noted as “*a valuable resource which, in the absence of disaster, is perpetually renewable. Nothing artificial should therefore be discharged into that system if the possibility exists of long-term damage which may not be detectable until too late.*”.

The Waitangi Tribunal for the first time in a decision noted that “*the Maori lore on the conservation and preservation of natural resources, as inherited by word of mouth, represents the collective wisdom of generations of people whose existence depended upon their perception and observation of nature. We do not consider that the weight given to scientific evidence should be such as to denigrate the worth of customary lore, or to inhibit Maori people from relying upon it.*”. This was (and remains) a significant statement, a cornerstone of what is now commonly expressed as the difference between what maori know and understand from nature versus (and it is

often expressed in this way) what scientists learn from their “modern” techniques and methods. The Tribunal also heard of the impact of “cultural” pollution as distinct from scientifically-measurable pollution of reefs (ie “ *human wastes are not supposed to be discharged into our food basket*”).

The Taranaki Regional Council 1980-2000

The Taranaki Catchment Commission was formed 1970, and its first full time employee taken on in 1973 (Dougal Douglas). It was given, amongst other things, the responsibility for managing freshwater and coastal water quality and marine ecology (including seafoods), and this has remained even after change to legislation in 1991.

Main issues in the region in the early days were water quality and increased demands for water use – dairy factories and farmers were the main targets, along with work to ensure that rivers were not over-allocated. However a major upsurge in work occurred in the late 1970s due to conflicts of increased use demands and recreational, scenic values, trout fishing, and coastal food resource use, including things like the Patea Dam, NGC treatment plant and ammonia-urea plant at Kapuni, and onshore oil & gas exploration. This led to the Government-funded Ring Plain project which aimed to learn as much as possible about streams and rivers, groundwater and land use in the Taranaki ring plain. Also, the discharge of sewage and meatworks waste into the Waitara River from that town was noted as creating a significant public health problem (by the Medical Officer of Health), including for maori seafood gatherers along that part of the coast, and a new marine outfall was commissioned in 1978.

Then the Think Big projects & National Development Act arrived in the early 1980s, requiring major investigations and reports (and even longer hearings). Major increases in staff occurred, from 10 in 1978 to over 50 in 1982, to cope with these demands. Also happening in this early-mid 1980s time were an expansion in onshore oil exploration & production (especially McKee), dairy factory amalgamations, expansion of Kiwi Dairy Co, bad spills and pollution events at the ammonia-urea plant, a multitude of pipelines across the countryside and the Omata tank farm, a leaky landfill at IWD, and even three milk tanker driver strikes.

The Waitara outfall became a major item throughout the 1980s, especially when the methanol and synthetic petrol plants came on-stream and added their wastes to the mix. The New Plymouth carousel plant came into being, with its short outfall into the sea at the mouth of the Waiwakaiho – older people will well remember the sludge disposal problems, the nasty odours and the runoff onto the beach – as well as other problems such as the Moa-nui Brixton factory with its own short outfall and of course the Bell Block oxidation ponds, eventually joined to the carousel plant.

Compliance monitoring became “big business”, as did planning to prevent spills and, if they happened, make sure they were cleaned up properly.

And so what we see now as the TRC was born and remains today, along with its work in these areas and continued compliance monitoring of discharges and events along the North Taranaki coast.

What Influences Coastal Seafoods in North Taranaki?

The North Taranaki coastline is, and has been for some considerable time, a prime focus of human habitation and activity, from the earliest Maori settlements to today's urbanisation, industry and recreation. As expected therefore, much of what affects the types of seafood found on the coast, and its density, relates to this influence – whether from direct discharges of waste or more diffuse, indirect discharges, physical disturbances (eg dredging and spoil disposal, reclamation), and from pressures from other coastal uses (eg shellfish collection).

But it must not be overlooked that probably the largest influence is the manner of the coast itself, namely that it is a north/west facing, highly-exposed coastline which gets regularly battered by strong seas and is subjected to considerable sand abrasion, burial, and movement up and down. This “environmental” influence is viewed by most experts as the single biggest factor influencing what is found where, and in what densities.

Direct discharges include(d) the New Plymouth sewage outfall at Eliot Street (now gone), the Bell Block oxidation ponds (ditto), the Carrousel plant discharge, the old Brixton dairy factory (now gone), Waitara sewage and meatworks wastes along with certain other industrial wastes (methanol & synthetic petrol plants included), and small sewage discharges from Onaero and Urenui. Discharges from shipping and boating into the sea (eg bilge water, sewage, ballast water) are also considered direct discharges, although their impact on water quality and hence seafoods is regarded as slight except in the harbour basin. Accidental spills do occur, whether from land or sea, but these are generally few in number and only the rare spills have a major and indeed measurable impact on seafoods in the area.

“Indirect” discharges is a term used to generally describe the effects of rivers on the coast, and therefore include the considerable amounts of faecal bacteria, nutrients and solids carried down the Waitara River after rain on the farms and hill country upstream (now seen as the major source of these in local seafoods). The material and nutrients that rivers carry to the coast, and the effect that the rivers have in reducing the salinity of the seawater slightly and warming the sea surface, is one reason why some shellfish species occur in greater numbers at river mouths (eg mussels) – they like to filter the solids, bacteria, algae and nutrients from the river water, or from the seawater which has been enriched by the river – and of course everyone likes a nice warm bath to live in!! But in some seasons, especially in late summer or autumn after the first rain following a long dry spell, these same river nutrients mix with a warm sea and cause blooms of algae and diatoms, which can then end up on the shore looking like a sewage scum or foam, or even an oil slick (as was occasionally seen at Oaonui in the early-mid 1980s) – and when these die and break down, they even smell like sewage or other rotting waste. They are however quite natural.

“Indirect discharge” also is also used, rather mistakenly, to describe the runoff of urban stormwater which can carry significant amounts of trace metals, faecal bacteria, oils and solids particularly from the “first flush” of rain on city streets (the Waiwakaiho being significant here) – in fact, in some situations, this first-flush urban runoff has been monitored as being almost as bad as raw sewage.

A map showing these areas, features and outfalls is attached.

North Taranaki Marine Ecology Projects – a Summary

Some of the earliest work and projects done by the then TCC was in North Taranaki, and involved the coastal environment, largely driven by proposals for new petrochemical plants in the area but actually undertaken as baseline studies against which future monitoring results could be compared. These included:

Recreational Use of Water in North Taranaki (TCC 1980) – this major study included offshore waters and the coastline itself (Warea – Waitara) and involved assessment of many factors (scenic beauty, facilities provided etc) as well as details of use obtained from various sources (including local maori). Seafood collection was recognised as being of major importance to both maori and non-maori. The reefs at Ahu Ahu, Oakura, Waiwakaiho and Waitara (including Airedale) were noted as being the most important in terms of both species/numbers available and (with the exception of Waitara) of numbers of people using them. Specifically, the reefs at Waitara were noted as being “perceived to be contaminated by the Waitara sewage outfall”, and hence, despite the abundance of shellfish (both variety and numbers) on these reefs, little use was made of them. The Mangati, Puketapu and Otira reefs were noted as providing a large number of certain key seafood species (kina, paua, mussels, and pupu in particular) to “local Maoris”, especially for major occasions, as well as Bell Block and Waitara residents. Recommendations included making sure that water quality remained as high as necessary to allow safe shellfish eating along the whole coastline, that the importance of seafoods to maori be specifically recognised and measures undertaken to protect these resources, and that the two major sewage discharges along the coast (New Plymouth’s Elliot St discharge and the Waitara discharge) be upgraded to ensure that these were attained.

Trace Metals in North Taranaki Shellfish; Results of a Baseline Survey Conducted in 1981 (TCC 1985) – this study looked at levels of a number of trace metals in green-shelled mussels taken from reefs at Waiwakaiho, Waiongana, Otaraoa Road, and Motunui (Epiha Road), and paua taken from further east at Buchanans Bay. In the mussels, although there were differences between sites noted, only lead at Waiwakaiho showed up as being perhaps higher than what might be called a normal range, in all likelihood due to road and stormwater runoff into the river and coastal areas. For paua, most of the measured metal was in the soft body parts rather than the foot, and levels were again within expected normal ranges except for zinc in soft body parts caused by the presence of high levels of zinc-containing sediment in the guts of these animals. For both species there was no human health risk from the levels of trace metals present.

In 1980/1, proposals for new petrochemical plants in North Taranaki lead to a number of investigations and reports, several of which covered the coastal environment . The main area of focus was the Waitara-Motunui area, and several reports were prepared including those discussed below – but before we get into a description of these studies, there are some ***essential phrases and terms*** you will need to be familiar with:

Transect – essentially a line marked down the shore from high tide to low tide, sometimes even below the low tide mark. At regular spaces or tide levels down these transects, surveys are made of the type of substrate present, and the algae and animal species present. This is done by using.....

Quadrats, which are generally 0.5 metre by 0.5 metre frames within which the scientist looks at everything present and bases his/her conclusions on what they see. For most surveys, multiple quadrats (eg 10 or 15) are randomly placed at a certain tide level (eg mid tide or low tide level) and the results from all of these analysed statistically in order to provide an accurate scientific comparison between sites and over time. Such sampling is called random sampling. See the final section of this report for a comparison of this form of survey with what maori would do (and hence know) on their seafood gathering trips to the coast.

The studies

Proposed Methanol Plant, Petralgas Chemicals Ltd, Environmental Impact Report (1980) – prepared by consultants for Petralgas, with the proposal at this stage to take water from, and discharge all wastes and stormwater to, the Waitara River, and hence only brief mention was made of potential effects of these on the biology and use of the Waitara River estuary (none claimed). Eventually however the water rights for the plant required that the wastes be disposed of to sea via the Waitara outfall, where their very small volume and higher quality in relation to the Borthwicks freezing works and town sewage discharge through the same pipe meant that its environmental impact would be extremely small if not in fact immeasurable.

Water Resource Investigations; Synthetic Petrol Plant – Motunui; Part 1 Marine Ecology and Part 2 Bacteriology (one volume, TCC 1981) – this was a report prepared by the TCC as a background to the synthetic petrol plant NDA hearings. At this stage, there was to be a long marine outfall off Epiha Road for the discharge of plant wastes. The investigations looked in general at the coastal environment from Waiongana to Buchanans Bay, and in detail at the Motunui reef system and surrounding area. One focus of the detailed study was edible seafood species.

Based on looking at ten quadrats in each of the three zones on the shore (high, mid and lowest tide marks) on eight transect lines down the Motunui shore and at other North Taranaki reef locations, this work provides a good baseline view of what species were present in the areas at this time, including important seafood species, and became the baseline for the comprehensive monitoring programme commenced just before the plant was constructed. The wastes of course were later routed to the Waitara outfall rather than to sea in a separate outfall, mainly as the result of the 1982 Waitangi Tribunal hearing into the Te Atiawa claim in 1982.

With regard to edible seafoods, it was noted that most of these species occurred at the lowest tide mark, and hence random 1.0 X 1.0 m quadrats were used to estimate numbers, densities, and size distributions of species present in

the eight transect lines at this tide level. It was noted that “*isolated populations of four edible species (paua, sea urchin, green mussel and black slug) occurred along the Motunui coastline.... Paua occurred on four reefs, at high densities at Buchanan’s Bay but densities on one reef, Otaraoa West, were very low. No paua occurred on reefs adjacent to Epiha Road. All paua counted were well under the legal size limit of 125 mm total length..... Newly settled individuals (<10mm) were present at Waiongana Reef only.*” Also, green mussels were noted as being of highest densities at Waiongana North [sic], Otaraoa, and west Motunui reefs, whereas kina were noted at high densities at Waiongana only. Species of pupu occurred at various densities along the coast, octopus were noted as being at “*low densities at low tide level*”, and the red crab was noted as “*common at low level of shore and shallow subtidal*” areas.

There was great variability in populations and numbers of individuals along the shore observed, and “*patchy*” distribution of some species (eg kina), to the extent that “*This temporal and spatial diversity greatly complicates the detection of further variations superimposed by any effluent...*”. The main factors causing this were physical disturbance on a rugged and active coastline (boulder overturn, sand scour etc), uneven settlement of juveniles caused by the prevalent exposed conditions, and predation of some species by others. It was noted that the methods used for this survey would need to be refined (“*stratified random sampling*”) in order to give enough statistical support for measuring any change in populations caused by pollution.

Water and mussels at the mouths of the Waipapa, Waihi and Parahaki Streams were also tested for sewage bacteria pollution, and it was noted that whilst the seawater was of a quality acceptable for bathing, it was not good enough for safe shellfish growing. The quality of the mussels themselves was also at times above health limits – this was believed to be due to the impact of land and farm runoff during wet periods, although there was a concern expressed at the possible impact of the Waitara outfall, evidenced by fat from a Borthwicks spill being seen on the Motunui coast some days later.

Once the methanol plant was built and in operation, and its wastes discharged to sea via the Waitara outfall, a lot of attention was given to the impacts of that outfall, and whether the discharge should be treated prior to discharge. Along with this was a lot of work looking at the toxic effects that the water treatment chemicals used at the plant might have once discharged to the sea (and based on these results, certain chemicals with little or no toxicity following discharge were used at the plant). There was also some work done looking at the effects on bacteria levels in seawater caused by the river as well as the outfall, and of course detailed monitoring of the whole marine environment has continued to this day. A great number of reports outlining results of these projects were prepared, and the results are summarised as follows:

Waitara: Intertidal Marine Ecological Survey (TCC 1983) – this was a background report prepared for the hearing of the water right application by the Waitara Borough Council for its Waitara outfall discharge (sewage, Borthwicks and methanol plant wastes). The study area was from Waiongana to Airedale reefs, and included a survey of edible seafood species as well as a

more general study. Aerial mapping of the Waitara coastline was carried out to define the various reef systems. For the general ecological survey, use was again made of down-shore transects (twelve along the coastline) and random quadrats (ten per tide zone). Rock pools deeper than 20mm were not sampled, as these “do not represent a true intertidal habitat...”. In conjunction with this, there was a specific edible seafoods survey involving additional transects in between the twelve major ones above, and the presence or absence of edible species recorded in ten random quadrats at 20m intervals down the shoreline. For green mussels and kina, density of the species was noted and all individuals found were measured to the nearest 1mm. Mussel and kina condition was also determined (weighing the dried flesh).

Very detailed results were presented, including maps of the shoreline with diagrams of where on the shore (and in what physical habitat) species occurred. With regard to edible species, maps showed details of what species were found where, and in what densities. It was noted that there were four major mussel reefs in the Waitara area, and that kina showed a marked increase in size at Taioma compared with other sites, apparently because of the influence of the river. Paua were generally of low density although there were some patches where they were more numerous (eg east Taioma). This was also the first “official” record of the fact that paua along this coast rarely attain legal size (later determined to be due to a lack of a key species of food alga). The various species of algae, pupu, and crabs were noted as occurring at all sites but in varying densities, and octopus were noted as being only rarely encountered (although this may have been due more to the sampling method used – ie people know where to look for octopus whereas a random sampling method in all likelihood will miss these few locations).

As with earlier studies, the impact of physical factors in determining what species occurred where, and in what numbers, was noted, especially sand scour or burial, as well as predation.

The significance to maori of the variety and density of edible seafood species on the Waitara reefs was noted, but as was the fact that not many people collected there because of pollution from the outfall. There was no measurable impact of the Waitara outfall on the number of species present, nor their abundance, at the Waitara reefs, although the fatty discharge from the Brixton dairy factory was noted to cause an increase in tubeworm beds at Tuaranga Reef. There was however, as expected, significant contamination of edible seafoods at Waitara caused by the outfall and, it was claimed, the river at times of high flow (see below).

Recommendations included ensuring that edible seafoods at Waitara were safe to eat, that regular monitoring be undertaken to keep a watch on this, and that the Brixton outfall be shut down and those wastes routed to the Waitara outfall.

A 5 year water right was granted, and important monitoring programmes were required to be undertaken (see below).

In the early 1980s maori and others had complained to the TCC (and indeed at the Waitangi Tribunal) that mussels at Airedale reef had weak shells which crushed when walked on. This was investigated in that year.

The Influence of Coastal Municipal Outfalls on the Condition, Allometry and Shell Strength of North Taranaki Mussels (TCC 1983) – this work showed that whilst Airedale Reef mussels did in fact have thinner shells, their strength against crushing and puncturing was not outside the range found along other areas of the coast (from Hobson Street New Plymouth, Waiongana, Airedale, Otaraoa Road reefs and Wai-iti Beach). In fact the polluted Airedale reef mussels had stronger shells than those from Wai-iti, and the differences were explained by ecological differences (sand scour, density of mussels in the beds).

In 1983-4, the North Taranaki Regional Wastewater Disposal Task Force undertook a major investigation into options for co-ordinated waste disposal for the Waitara region. This was largely brought about as a result of recommendations from the Waitangi Tribunal hearing the Te Atiawa claim, and eventually resulted in the routing of synthetic petrol plant wastes to Waitara rather than to sea through a separate outfall at Epiha Road. The Taranaki Catchment Commission provided major input to this project (oceanographic, marine ecological studies in particular). The marine ecological study is summarised below:

Waitara Regional Wastewater Disposal, Part 4: Marine Ecological Studies (TCC 1984) - this major study covered sites from Mangati Reef to Pariokariwa Point, and looked in particular at “the distribution and interrelationships of intertidal, subtidal and planktonic marine life on the shoreline and in adjacent waters”. As with previous studies, there was a section focused on edible seafoods, which noted that the green-shelled mussel was the most abundant in terms of both numbers per reef and reefs over the study area. Of relevance to this discussion, presence/absence information was collected at three shore levels (high tide, mid and low tide) using fifteen quadrats at each level down 41 down-shore transects along the shore. As well, an edible seafood survey was undertaken using ten random quadrats at 120 down-shore transects (generally 75-150 m apart) along the shore, looking at distribution, density and abundance of eleven edible species, the size distribution of mussels, paua, kina and black sea slugs was recorded, and the biomass (total meat weight per bed/reef) of mussels, paua and kina on reefs was also determined. Finally there was also carried out a survey of subtidal seafood species by surveying transects extending seawards from the shore at regular intervals along the coast. This included looking at crayfish and fish as well as shellfish, and was a simple presence/absence survey.

Orapa, Wai-iti, Urenui, Motunui and Waiongana East reefs ranked top (in that order) in terms of both total numbers of mussels present and total meat weight per bed, and Waitara East also had good numbers of mussels present. It was noted that all of the best sites were adjacent to significant discharges of freshwater into the sea, indicating the significant contribution that this source of nutrients makes to the size of beds and the mussels in the bed.

The prime sites for kina were noted as being Airedale, Orapa, Waiongana West, Otaraoa and Mangati, whereas the five top spots for paua were Waiongana West, Airedale, Orapa, Otaraoa and Waiongana East reefs. Black sea slugs were noted as significant at Orapa, Airedale, Buchanan's bay, Waiongana East and Otaraoa, whilst kotoretore and one species of pupu (the large whelk) were noted at Mangati, Wai-iti, Turangi [sic], Waiongana East and Urenui. Red crabs, other species of pupu and starfish were noted at all reefs studies, but at generally low densities. No octopus were seen but were acknowledged as occurring at certain locations in certain seasons.

In the subtidal areas the diversity and abundance of species in all sites was low compared with other New Zealand areas, due to the high energy of the coast not pollution, and lower in areas influenced by major rivers.

The "top 5" zones of all prime edible seafood species (based on species present and numbers of individuals) were identified as Waiongana, Waitara (Orapa, Waitara East & Airedale), Wai-iti, Motunui, Urenui, and Buchanan's Bay, for different species/reasons. It was however noted that the abundance of seafood on the Waitara reefs (Orapa to Airedale) may well have resulted from a much reduced harvesting pressure because of known pollution from the Waitara outfall.

This report is a very valuable scientific report on the ecology of the coastline as it was in the early-mid 1980s, and contains a lot of detailed information and maps/figures, in particular where seafoods are found and at what densities and biomass. It also contains detailed descriptions of the ecology of different shore areas/types (rocky, lahar, sand, petrified forest etc) as well as an excellent discussion on what factors (physical and biological) impact on the occurrences and densities of species (including seafoods) along the shore.

In 1986, a year after the synthetic petrol plant wastes started discharging to sea via the Waitara outfall, an application was made to double the volume and the water treatment chemical content of that waste. An investigation specifically targeted at maori seafoods was carried out.

Maori Seafoods in the Waitara Embayment (TCC 1986) – this general review of previous ecological studies looked at edible seafoods in the area from Tokotarata reef to Airedale reef, and called upon knowledge and expertise of Aila Taylor as well as TCC scientists. It is a good base document upon which to found further studies, as it contains basic details of the biology and ecology of the various seafood species as well as maps showing the location and densities of edible species along the shoreline.

In 1987 it was realised that some of the monitoring for the Waitara outfall water right carried out by the then North Taranaki District Council was flawed, and so a new programme was put in place as a lead up to the application to renew the approval for this discharge in 1988. A substantial amount of work was carried out in 1987/8 by the TCC, looking mainly at bacterial pollution, and was presented in:

Water Right Impact Monitoring – North Taranaki District Council Waitara Marine Outfall, Bacteriological Monitoring Programme Annual Report for 1987 (TCC 1988) – included in this work was an investigation of sewage bacteria levels in rivers (Waitara, Waiongana) and the Waitara outfall discharge as well as shoreline seawater from Tuaranga reef to Airedale reef. Results showed that a significant portion of bacterial pollution measured in shoreline seawater was derived from the rivers, although in certain tide and wind conditions the Waitara outfall played a major role in contaminating the shoreline.

This finding led to more comprehensive work which came to the same general conclusions, although it was noted that it was at times difficult to tell what source of bacteria was causing the problems noted in shoreline seawater.

In 1989 application was made for a continuation of the 4 discharges from the Waitara outfall, but with treatment for the sewage and Borthwicks waste streams, and a refurbishment of the outfall to make it more efficient. The application was not objected to, and in fact Te Atiawa supported the move as an advance towards what the Waitangi tribunal had recommended in 1983. The rights were granted, and an annual set of monitoring programmes put in place including for marine ecological effects and bacterial pollution.

As early as 1990 it was noted that, with the new treatment in place, there were still occasions when shoreline water and reefs (Orapa to Airedale) were contaminated with bacteria, but that the dominant source of this pollution was from the Waitara River (land runoff, especially in wet weather). These findings have remained the same through to 2000.

With regard to marine ecology, in the 1990/1 monitoring report it was noted that there was no measurable impact of the discharge from the Waitara outfall on marine ecology in terms of numbers of species and of individuals, and although there is an effect noted at Airedale reef this is believed to be due to the major impact of the Waitara River rather than the outfall. Monitoring has continued through to the present day, with the same conclusion drawn along with an observation that occasional sand inundation along the coast in general caused by differing weather and tidal conditions had a major impact at times at all sites. With the closure of the AFFCO (previously Borthwicks) meatworks in the late 1990s, any effects that may have been from the outfall will be significantly lower.

Away From Waitara

There were of course other things going on along the North Taranaki coast during the past 20 years, as summarised below:

Moa-nui Brixton Dairy Factory Monitoring – the Moa-nui Brixton dairy factory discharged its wastes (not sewage) to the shoreline through a short outfall at Waiongana reef. In 1986 the wastes from the company's Inglewood factory were also piped to the same outfall. Early monitoring work noted ecological impact several hundreds of metres away from the outfall, particularly to the east, which however increased when the Inglewood wastes

were added. The main impacts were reduced algae species and dominance of tube worms in the affected area (up to 500 m east). Improvements in waste treatment coupled with an extension to the outfall in 1988 resulted in improvements to the ecology, but only slightly. The closure of the discharge will result in further improvements over time, once the tube worm colonies die off and allow other organisms to colonise the reef.

Bell Block Oxidation Ponds Monitoring – in 1981 the Taranaki County Council applied for approval to continue discharging treated sewage from the Bell Block oxidation ponds via a series of swampy areas and overland flow into the sea near Mangati reef. An ecological survey was undertaken in 1982/3 which showed that the discharge did cause a measurable effect for 200 metres either side of the “outfall”. The discharge was approved for a 3 year term, subject to various conditions including further monitoring. In 1985 this work noted the same effects, and recommended that these wastes be piped to the New Plymouth carousel plant. This has happened, and improvement in coastal ecology has been measured but, as with Brixton, will require the death and decay of all tube worm beds before it returns to “normal”.

New Plymouth City Council Carousel Plant – once the old Elliot Street short outfall and raw sewage, and now, since the mid-1980s, a “state of the art” carousel plant and a longer outfall to the area east of the Waiwakaiho River mouth. Monitoring since 1985 has shown that there have been no adverse environmental effects on the environment (water, marine ecology, shellfish in particular) from either the outfall or the disposal of sewage sludge in lagoons near the plant. An application for approval to switch off the effluent disinfection process was studied with a trial non-disinfection period in 1986/7, but the increase in sewage bacterial levels in shoreline seawater and shellfish was such that the New Plymouth City Council withdrew the application.

General Reports and Reviews

In the Taranaki Regional Council’s 1996 State of the Environment Monitoring Report it is noted that:

Overall, coastal water quality in previously degraded areas in the region has improved significantly over the past two decades as a result of a significant decrease in the number of, and improvement in the quality of, point source discharges to the coast. It is difficult to draw conclusions about changes in marine ecological diversity over time but continued regular monitoring will assist in determining trends in the future.

North Taranaki is probably the best example in the region of this statement.

In 1999 Auckland Museum undertook a study of the North Taranaki coast from New Plymouth to Awakino, both onshore and offshore, in what they described as a study of “*the previously little-studied coast of north Taranaki.*” This work provides a useful “technical” reference to the different species found in the differing coastal environments along the coast, dominated as they are by the type of substrate, degree

of exposure to wave action, and influence of rivers. It does however provide no useful information on edible species, their location and densities.

Finally, as an addition to the work done on the North Taranaki coast, Fletcher Challenge Energy commissioned a review of some of the above studies as an input to obtaining approvals for the development of the Pohokura field seawards of the Motunui methanol plant. In terms of marine ecology it looked at the area from Tuaranga reef to Pariokariwa Point, and provides a very generalised description of marine life along this stretch of coast.

A Comment on Methods Used

Do the methods used in the various scientific studies noted above, in particular those carried out by the Taranaki Catchment Commission/Regional Council, actually mean anything in terms of what maori would do on the shore to collect edible seafood?

The scientific studies, including those specifically looking at edible seafoods, use transects down the shore at various locations, and randomly-placed quadrats on those transects as a means of determining what species are present, and in what numbers and densities. These results can then form the basis for obtaining information on total numbers in a bed, the size distribution of a bed, etc. This is called random sampling, even stratified random sampling, and is supposed to be an un-biased look at the shore (ie the scientist does not want to pre-determine or select the sampling sites based on his/her feel for the coast). These methods will pick up virtually everything on the coast with the possible exception of any species that might only occur in tight patches in odd locations (eg as kina might do). Even then however, continued repeating of the surveys and using more tightly-spaced, or different, transects will eventually find even these.

On the other hand, maori (and smart non-maori) will know where to look based on experience, and will go directly there – ie they are biased “surveys” in direct contrast to the above.

Given the amount of work that has been carried out on the North Taranaki coastline over the past 20 years, however, it is almost certain that the scientific work has indeed found what there is to find on the coast, and has even gone as far as estimating the biomass of key species on several reefs using aerial mapping and detailed measurement of meat weights. The survey proposed as Phase 2 of this project will help to “fill in the gaps”, if indeed such gaps exist. Hopefully it will also enable a comparison to be made of the two types of approach, traditional maori and scientific, and to see therefore if there really are any differences.

Dr Mike Patrick
30 January 2000

Kaimoana Survey 2000/2001

A collaboration between Fletcher Challenge Energy, Otaraua Hapu, Ngati Rahiri, Ngati Matunga and the Taranaki Regional Council.

Phase 3 : North Taranaki Coastal Seafood Resources – Summary of Findings, and Recommendations

North Taranaki Coastal Seafood Resources – Phase 3: Summary of Findings, and Recommendations

This report summarises the results and findings of the coastal seafood survey work undertaken along the North Taranaki coastline by two hapu during the makiri tides of 2001. It also makes certain recommendations on possible future management regimes for this stretch of coastline. It is Phase 3 of a three-phase study.

Below is a section from the Phase 1 report, which summarised previous results and work along the North Taranaki coastline, which is worth repeating here (updated).

What Influences Coastal Seafoods in North Taranaki?

The North Taranaki coastline is, and has been for some considerable time, a prime focus of human habitation and activity, from the earliest maori settlements to today's urbanisation, industry and recreation. As expected therefore, much of what affects the types of seafood found on the coast, and its density, relates to this influence – whether from direct discharges of waste or more diffuse, indirect discharges, physical disturbances (eg dredging and spoil disposal, reclamation), and from pressures from other coastal uses (eg shellfish collection).

But it must not be overlooked that probably the largest influence is the manner of the coast itself, namely that it is a north/west facing, highly-exposed coastline which gets regularly battered by strong seas and is subjected to considerable sand abrasion, burial, and movement up and down. This “environmental” influence is viewed by most experts as the single biggest factor influencing what is found where, and in what densities.

Direct discharges included the New Plymouth sewage outfall at Eliot Street, the Bell Block oxidation ponds, the Carrousel plant discharge, the old Brixton dairy factory, Waitara sewage and meatworks wastes along with certain other industrial wastes (methanol & synthetic petrol plants included), and small sewage discharges from Onaero and Urenui. Many of these discharges have now been removed from the coast, and only the Carrousel plant and Waitara (without the meatworks) discharges remain.

Contaminated discharges from shipping and boating into the sea (eg bilge water, sewage, ballast water) are also considered direct discharges, although their impact on water quality and hence seafoods is regarded as slight except in the harbour basin. Possibly of greater potential impact is the introduction of new organisms from the discharge of ballast water or from hull fouling, which, if successful in colonising the coastline, could displace native organisms including food species.

Accidental spills do occur, whether from land or sea, but these are generally few in number and only the rare spills have a major and indeed measurable impact on seafoods in the area.

“Indirect” discharges is a term used to generally describe the effects of rivers on the coast, and therefore include the considerable amounts of faecal bacteria, nutrients and

solids carried down the Waitara River after rain on the farms and hill country upstream (now seen as the major source of these in local seafoods). The material and nutrients that rivers carry to the coast, and the effect that the rivers have in reducing the salinity of the seawater slightly and warming the sea surface, is one reason why some shellfish species occur in greater numbers at river mouths (eg mussels) – they like to filter the solids, bacteria, algae and nutrients from the river water, or from the seawater which has been enriched by the river – and of course everyone likes a nice warm bath to live in!! But in some seasons, especially in late summer or autumn after the first rain following a long dry spell, these same river nutrients mix with a warm sea and cause blooms of algae and diatoms, which can then end up on the shore looking like a sewage scum or foam, or even an oil slick (as was occasionally seen at Oaonui in the early-mid 1980s) – and when these die and break down, they even smell like sewage or other rotting waste. They are however quite natural.

“Indirect discharge” also is also used, rather mistakenly, to describe the runoff of urban stormwater which can carry significant amounts of rubbish, trace metals, faecal bacteria, oils and solids particularly from the “first flush” of rain on city streets (the Waiwakaiho being significant here) – in fact, in some situations, this first-flush urban runoff has been monitored as being almost as bad as raw sewage.

Finally, the fishing pressure on seafood species will at times play a major role in determining what occurs where and in what numbers – given the fragile nature of the North Taranaki coastline because of its exposure to prevailing tides and winds, sustainable use of these seafood resources becomes a fine balance between what is taken and what the environment and habitat can maintain. Any over-fishing, as for example was claimed happened at Motunui during the construction of the synthetic petrol plant in the mid 1980s, can have a major impact, which takes some considerable time to repair.

Coastal Seafoods of North Taranaki

In this section of the report, the survey results from the various reefs will be summarised and, where possible, compared with results from previous surveys. Because of the nature of the survey undertaken by the hapu (termed semi-quantitative), it is difficult to compare in detail the current results with the specifically scientific surveys undertaken in previous years, but general comparisons can be made.

Results and comparisons will be set out reef by reef. For ease of comparison with previous surveys, reefs are grouped in some circumstances according to the names and areas used in those previous surveys.

Otira, Onatiki & Tokataratara

In previous surveys undertaken by the Taranaki Regional Council and its predecessor the Taranaki Catchment Commission, the western end of these reefs formed the eastern extent of the “Waiongana reef” system. It was impacted by the Brixton dairy factory outfall, which discharged at or near the low tide mark for many years and created and sometimes even killed significant tube worm beds, which reduced the numbers and densities of many other common shoreline species. In the mid-1980s

Tokataratara was been recorded as having good densities of kina, mussels, the larger pupu species and rori in areas where there were no tube worms beds, and likewise Otira was noted to have good densities of paua and kina as well. In 1990 it was noted that there was a large extent of tube worm beds on Onataki, and few of any edible species except for the occasional crab.

In the 2001 survey there was recorded a generally good presence of crabs, rori and starfish throughout these reefs, and “*heaps of tua tua*” were noted by surveyors at all sites on Otira. Kina were abundant on Tokataratara, especially offshore, but either rare or not found on Otira and Onataki, except at one location offshore at Otira (along with “*lots of stingrays*”). Paua were only rarely encountered except for the northern edge of Tokataratara and offshore, where they were common and even abundant in places. Pupu species were abundant at all sites, and mussels were either not encountered or occurred in sparse patches on Tokataratara.

Differences between earlier surveys and the 2001 survey may in part be explained by the continuing breakdown of the old tube worm beds, which exposes more substrate for habitation by various species including seafood species. The apparent decline of paua and kina at Otira is unable to be explained at this time, although one suggestion is the reduced amount of edible organic matter in the area since the old dairy factory outfall was closed down.

Tuaranga

Previous surveys showed this to be a significant mussel and kina reef, with good numbers of rori and occasional patches of large numbers of paua present at times.

In the 2001 survey a good general presence of crabs and starfish was noted, with few rori encountered. Kina and paua (small) were generally common with the occasional patch showing abundant numbers and large size of individuals. Black mussels and rock oysters were also noted at one site. A similar story was observed for the pupu species, and mussels were generally not observed except in a small number of places, at very low numbers.

The differences between the earlier surveys and the 2001 survey, in particular for rori and mussels, is difficult to explain at this stage.

Orapa

This reef has in the past had good densities of kina and rori in many areas, and in 1985 ranked 1st in North Taranaki in terms of mussel numbers and total meat weight per bed. In 1999 it was noted by the Regional Council that numbers and diversity at Orapa East had dropped off significantly from previous years because of movement of a large amount of sand onto this reef.

In the 2001 survey Orapa showed relatively sparse areas of crabs, rori and starfish, patches of paua and kina at low to moderate numbers (although at one site it was noted that there were “*heaps of kina*”), and a similar story for pupu except for more densely populated areas to the western end of the reef. Mussels were generally not

observed except three locations, two of which contained abundant numbers, but of small size.

These results would appear to tie in with the most recent Regional Council survey results noted above.

Taioma & Te Puna

Commonly called “Airedale reef” in previous surveys, these reefs have been recorded as containing moderate to large numbers of pupu, low to moderate numbers of small paua but a few localised patches of 3 or more per 0.25 m² quadrat, moderate numbers of mussels but with some very dense patches occurring (20 or more per quadrat), significant numbers of kina (with larger ones occurring nearer the Waitara River), common red crab, common starfish with bigger ones associated with mussel patches, and quite low numbers of the rori except at Te Puna, where they were more common.

In the 1999/2000 survey it was noted that there has been a marked reduction in kina, both in terms of areal extent and frequency when compared with these previous surveys, and an associated increase in numbers of pupu. Paua also appear to have become less frequent at Taioma. These observations are likely to be caused by ingress of significant volumes of sand into this area noted by the Regional Council in its recent Waitara outfall monitoring surveys, although another issue is whether the removal of a significant amount of organic matter (ie food) from the area with removal of the meatworks waste at Waitara and treatment of sewage has had any impact on numbers and size of seafood species, especially mussels.

In the 2001 survey, there was an abundance of crabs (some noted as large) and starfish around Taioma and the northern edge of Te Puna, but no rori were encountered at any site. Paua and kina were abundant in certain patches along the northern edges of both reefs, but not recorded elsewhere. Pupu species were abundant at Taioma but were either not observed, or occurred in rare to common numbers at Te Puna. Mussels were abundant along the western edge of Taioma, alongside the influence of the Waitara River, and at one location at the eastern end of Te Puna.

Interestingly the surveyors noted “*sewage*” at some sites, which seems unlikely but warrants further investigation.

Offshore records in the 2001 survey noted “*thousands of little paua*”, which is an excellent sign that successful breeding is occurring and that any higher shore areas able to be colonised will not be lacking in numbers of juveniles to do so.

These results would appear to tie in with the most recent Regional Council survey results noted above.

Titirangi

These reefs appear to have been called the “Otaraoa reef” system in previous surveys, and were noted in 1981-3 as having high numbers of mussels, moderate numbers of small paua (60-70 mm), and good patches of kina and rori. In 1985 however it was noted that there were no mussels on these reefs, no kina as well on “Otaraoa West”

but a good density of them on “Otaraoa East”. Rori were found in low numbers on “Otaraoa West” but not at all on “Otaraoa East”. “Otaraoa North” was noted in 1985 as having rare kina, no mussels, few rori, but good patches of pupu in moderate density.

It has been claimed that the work-force building the Motunui synthetic petrol plant significantly over-fished these reefs, and if true this may explain these significant differences within this 4-5 year period. The occasional movement of significant amounts of sand into this reef area will also have a major impact, driving paua, kina and pupu into cleaner areas (possibly offshore).

In the 2001 survey starfish and rori were observed in patches on the “Otaraoa North” and “Otaraoa East” reefs, and only very occasionally on “Otaraoa West”. Small crabs and paua were found in patches at rare or common densities on all three reef areas, and abundant offshore. Kina were not often encountered, but three abundant offshore patches were noted. Pupu were generally encountered along the whole reef system, with greater numbers observed at “Otaraoa North” and “Otaraoa East”, although they were abundant in one significant patch at the western extremity of “Otaraoa West”. Mussels were encountered infrequently, with a small patch at the western end of “Otaraoa West”, and an abundant patch in the centre of the “Otaraoa North” reef. “*Ngati Rahiri pipi*” were recorded at one location.

If anything, there would appear to be an improvement in the locations and numbers of seafood on these reefs since the previous surveys, but only slightly. The observations of “*dirty seawater*” at several locations may warrant further investigation.

Turangi West & Turangi

In previous studies these reefs have been also called “Motunui North”, “Turangi Road” and “Buchanans Bay”. “Motunui North” was noted in 1985 as having no kina or mussels, rare rori and few large pupu. “Turangi Road” in the same survey was noted to be very similar, but with good numbers of crabs. Some effect of the movement of sand into this reef area was noted in 1999/2000. “Buchanans Bay” was noted in the early 1980s as having abundant numbers of small paua, good densities of kina and rori, and rare mussels, but in 1985 this had reduced somewhat to occasional kina, rare paua, and very rare mussels, yet it still ranked as 5th or 6th in North Taranki terms of total edible seafoods.

In the 2001 survey crabs and starfish were commonly found at most locations, with rori also found commonly at Turangi West – there appeared to be a reduction in these species except starfish the nearer one got to the end of Turangi Road. Paua and kina occurred in many patches along this reef system, often at common numbers and occasionally in abundance (especially in deeper water, with one record noting “*big mountain of paua on big rock*”). Pupu were particularly abundant along the reef at either side of Turangi Road, falling away to common then rare at the farthest extremes of the reef. Mussels were not encountered at Turangi West, and were only rarely encountered at Turangi east of the road with the exception of one abundant patch offshore.

The reef known as “Motunui North” has increased significantly in locations and numbers of rori, kina and pupu, although mussels are still absent. A similar improvement in the reef known as “Turangi Road” was also observed, including the presence of oysters at one site, small paua and kina and “*heaps of crabs*” of various species at some locations. The former “Buchanans Bay” sites have shown no real change over the past decade. This latter site is known to be influenced by sand movement at times.

Centre Reef & Sunken Reef

There appears to have been no previous surveys of these reefs. In the 2001 survey crabs, starfish and rori were common at Centre Reef but only at the eastern end of Sunken Reef, probably because of the presence of a dominant sand substrate at its western end. Paua were encountered at at least half of the survey sites, being particularly abundant in patches at the northern edges of both reefs. Kina showed a similar pattern, although a significant patch of abundant kina was observed at the western end of Centre Reef. Pupu were encountered generally across the reef system, occasionally in abundance, whilst mussels were only encountered at three survey sites but in abundance at each.

Onaero

There appears to have been no previous surveys of this reef system. In the 2001 survey crabs, starfish and rori were observed at the western part of the reef, with crabs and starfish only noted at the most eastern site. No paua or kina were found, probably because of the nature of the substrate (gravel interspersed with sand) and the probably mobility of sand in the area. Pupu were abundant at the western end of the reef, whilst mussels were observed in abundance at the eastern end, and in particular the little black mussel. Some rocks however were noted as “*barren*”.

Urenui

In the mid-1980s it was noted that the Urenui reef system contained dense patches of large pupu species, and ranked 3rd in North Taranaki for mussel numbers and total meat weight per bed.

In the 2001 survey crabs were observed at many sites, starfish at three and rori at none. There were no paua or kina observed, again probably due to the influence of substrate type and mobility, but mussels (“2” to 4”, *some rocks completely covered*”) were generally abundant at all sites on this reef except at the sites farthest east. Pupu species were noted in abundance at one site to the west of the reef, and generally were common throughout the rest of the reef.

There would appear to have been no substantial change at this reef from earlier survey results.

Of interest is the possible impact that the shellfish harvesting ban during the shellfish poisoning incidents may have had in the 2001 survey results, especially for example at “pressure areas” such as Urenui, where fishing pressure from campers has often been extreme.

Future Monitoring?

The 2001 survey has proven to be an excellent semi-quantitative resource mapping exercise. But the North Taranaki coast is an extremely dynamic one, with significant environmental changes occurring at times. Is there a need for further monitoring along this part of the coastline? The simple answer is yes, for the following reasons.

Management of any resource or environment requires information, and with seafoods this in particular requires a detailed knowledge to be built up over the years of locations, species, densities, size, fishing pressure, and relevant environmental factors. Monitoring undertaken by a local or regional authority generally has one of two focuses – monitoring associated with a specific activity, as for example part of a resource consent (eg for a new outfall, sand extraction, oil exploration well etc); or that associated with trying to “get a handle on” the state of the environment. The first is paid for by the consent holder, the latter by the ratepayer in conjunction with other funding. It is this more general work that tends to be more general and not as detailed in terms of area and issue.

If hapu are keen to take a more active role in management of the coastal seafood resources of North Taranaki, then they must be prepared to more actively monitor these same resources – relying entirely upon others to do it may “fall between the cracks” as priorities change within councils year by year.

The benefits of hapu actively undertaking regular monitoring of their seafood resources are significant – it provides hapu and relevant authorities with the detailed information needed to better manage in a “hands-on” way the particular resources of their rohe (otherwise “*we’re managing things in a black hole*”); it provides an obvious cornerstone for development of an iwi or hapu environmental management plan; and it would of necessity engage and therefore educate other key stakeholders, including the ability for iwi to influence local and regional management planning.

There are already existing examples where regulatory agencies and iwi have joined together to form a management partnership for coastal seafood resources (eg at Maketu).

The 2001 coastal survey is one which will be able to be used as the baseline for any management regime put in place in future.

As a consequence it is recommended that further surveys of the seafood resources of these reefs be undertaken, preferably at the same tide each year and using the same techniques, so that any improvements or reductions can be noted and acted upon accordingly. It is also recommended that funding be sought from the Ministry for the Environment, Taranaki Regional Council, and applicants for resource consents.

Coastal Seafood Resources Management Options

As noted above, there have been changes in seafood communities along the reefs of North Taranaki, in some cases significant and detrimental. The explanations for these

changes will be many and varied, including sand movement (Taioma/Te Puna), reduced fishing pressure causing a positive change (the Motunui reefs), and perhaps over-exploitation of the seafood species.

There is little in the way that can be done about natural changes except to place restrictions, or even a rahui, on the taking of seafoods until the reefs recover. Reducing over-exploitation however can be the subject of a deliberate management regime. Re-seeding of juvenile seafood species onto damaged beds is also a potential way in which numbers and occurrence can be increased.

There is no doubt that the sustainable use of seafood resources of North Taranaki are a significant cultural and social factor for local hapu, as noted in 1983 by the Waitangi Tribunal. It would seem appropriate therefore to explore ways for hapu to be involved in the active management of these resources, including possible re-seeding, and the following section of this report describes some possible alternatives.

Existing Management Regimes

There is a number of existing management regimes available which could be put in place for the coastal seafood resources of North Taranaki, and which would enable iwi and hapu to take a more active, officially-recognised and formalised role in management of these resources. The following is a brief discussion of these regimes.

Restrictions on fishing in certain areas via Regulations under the Fisheries Act 1996

The overall purpose of the Fisheries Act is to allow utilisation of fisheries resources while ensuring sustainability. The word “utilisation” is defined as

.....conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic and cultural wellbeing.”

and “ensuring sustainability” is defined as

....maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment.”

The Minister may therefore make Regulations for commercial or amateur fishing and fisheries, including restrictions on allowable catches and shellfish quota, fishing methods to be used or not to be used, when harvesting can or cannot occur, and even to allocate access to a fishery between stakeholders.

This management tool is however generally only for resolving specific major fisheries issues, such as protecting penguins from set nets or seabirds while long-lining, or closing off particular shellfish areas or seasons, and it is probable therefore that it would not be used by the Minister for more general coastal seafood resource management along a stretch of coastline.

Taiapure made under the Fisheries Act 1996

A taiapure is a estuarine or coastal area that is traditionally important to an iwi or hapu, and recognises their special needs relating to the area concerned. A taiapure is managed by a committee that may include both maori and non-maori members who are nominated by the local maori community concerned. Anyone may fish in a taiapure, and commercial fishing may also occur. The committee may make recommendations to the Minister about any regulations needed to recognise and provide for customary food gathering, or to manage other fishing within the taiapure.

There are several taiapure in existence around New Zealand, and applications for several more are in the pipeline. Interestingly, in Golden Bay, local hapu are looking to establish a taiapure and to totally remove all existing paua (they, like in North Taranaki, very rarely get to legal size – in fact the story goes that the original paua in this particular area were imported from North Taranaki!!) and replace them with breeding stock from D’Urville Island, where they do attain legal size (John Mitchell, Tama Fishing Company *pers comm.*).

Given that anyone may fish in a taiapure, and that commercial fishing can also occur, establishing a taiapure along the North Taranaki coastine for the protection of culturally-important shellfish resources may not be the appropriate management regime to be used.

Mataitai reserves made under the Fisheries Act 1996

Mataitai reserves are areas that are identified traditional fishing grounds and where tangata whenua have a special relationship with the place. They have special status under the Fisheries Act to recognise and provide for non-commercial customary food gathering by maori. Both maori and non-maori may fish in a mataitai reserve, but they are managed by a maori committee (tangata tiaki) or kaitiaki who can make special bylaws restricting or prohibiting the taking of fish, aquatic life or seaweed in the reserve, if they consider it necessary for sustainable management. Commercial fishing may not occur in a mataitai reserve unless the tangata tiaki/kaitiaki recommends to the Minister that it be allowed.

Rapaki in Lyttelton harbour is the only existing mataitai reserve, but applications for others are currently being developed by other iwi and hapu.

Given the more hands-on and powerful management role for maori in a mataitai reserve, and its specific coverage of fish, shellfish, seaweed and any other marine life of cultural significance, it is recommended that hapu should commence developing a proposal for a mataitai reserve along the reef systems within their rohe, for approval by the Minister.

The Forthcoming Oceans Policy for New Zealand

In the late 1990s the Parliamentary Commissioner for the Environment (PCE) identified, within its Strategic plan, that the marine environment was a “*priority for attention because of its enormous value in economic, ecological and cultural terms, and because of growing community concerns about its management*”. The PCE

undertook a significant review of the management of New Zealand's marine environment, with the objective "to gain an understanding of the significant issues, and strategic risks and opportunities intrinsic to management of New Zealand's marine environment." The PCE went on to recommend to various Ministers to undertake reviews of particular legislation (eg Marine Reserves Act, Fisheries Act, Marine Farming Act and RMA) in terms of their efficacy in achieving sustainable management of the ocean.

Government has now decided that New Zealand needs an overarching Oceans Policy which will focus on the issues associated with managing the marine environment within the jurisdiction of New Zealand, including the territorial sea (which is almost identical in area to the coastal marine area under the Resource Management Act). The Policy is intended to provide ways to successfully manage the impact of human activity on the marine environment, and so it will address the interaction between land management and the status and quality of the marine environment and the inter-tidal zone, and consider management and policy issues associated with such areas.

The Oceans Policy, and process to develop it, is required by Government to take account of the existing rights and interests of stakeholders and the existing policies by which they are managed. It must identify and acknowledge all interests in the marine environment and address the interaction between them. This will ensure any conflict and tension between various interests can be reconciled. Any process to develop an overarching policy must acknowledge the interests of all parties and the implications and costs of any changes to their rights or the policies by which those rights are managed.

The rights which currently exist in the marine environment and which will be considered include:

- collective rights to particular environmental outcomes and the mandatory consideration of particular principles and values, such as the requirement to ensure utilisation of fisheries is consistent with protecting the marine habitat and the right to protect biological diversity by the use of marine reserves and other tools
- collective rights of access such as for maritime transport or recreational activities
- collective extractive rights such as customary fishing entitlements
- individual rights of access to particular areas for particular purposes – such as exploration rights to the seabed authorised by permits granted according to statutory criteria or authorisation to use coastal space for marinas or marine farms
- individual extractive rights to harvest specific species created by the Quota Management System.

The Committee will advise Government about all of the identified issues, rights, aims and desires of New Zealanders with regard to the ocean (including the coastal strip). The development of the Policy will be undertaken in three stages.

- *Defining the Vision* identifying the goals and principles for managing the marine environment
- *Designing the process to achieve the vision* – analysing the status quo and identifying the tools, policies, legal and institutional frameworks necessary to achieve the vision [timed for 2002]; and

- *Delivering the vision* – creating the tools and legal and institutional framework identified in stage two and developing the policies and procedures necessary to achieve the vision, including a monitoring and assessment capacity.

For Stage 1 above, a Ministerial Advisory Committee is currently consulting with all interested parties, and there is currently underway a general public consultation round with submissions closing on 17 August.

In terms of being heard in order to ensure that any form of new management regime can be considered for the North Taranaki coastal seafood resource, it is essential that coastal iwi and hapu associated with these resources get involved in this Oceans Policy process as soon as possible.

Whichever management regime is finally decided upon and actioned, it would be essential that input be provided into any relevant district and regional management planning, in order to ensure further recognition of and provision for the aims and objectives of hapu.

Re-seeding and Supplementing Seafood Species Along the North Taranaki Coastline

Re-seeding of juvenile animals, or even sexually-mature adults, into an area where they have been reduced significantly in numbers through some means (over-exploitation, environmental damage or natural causes) is a technique occasionally used to increase numbers and occurrence. For example, after major oil spills overseas, affected areas may be re-stocked once all clean-up operations have been finished.

In order for re-seeding to work, the environment into which the animals are to be placed must be suitable, and indeed should previously had the same species present in the past. Is there then a case for attempting re-seeding of seafood species in North Taranaki? Is the aim to increase the frequency and numbers of seafood animals along these reefs? Or is it perhaps to improve the size of some species, for example paua which are known to rarely reach legal size but for unknown reasons.

If the reduction in seafood was due to natural causes (sand inundation for example), re-seeding may not achieve much more than “letting nature take its course”, and hence could well be a significant waste of effort and money.

If the reduction was due to over-exploitation, there may be good initial results achieved through re-seeding, but this would also depend on the many environmental factors acting upon the reef systems at the time. There is also the very real fear that, once re-seeded, the reef becomes populated with seafood species which, when large enough, in the absence of an appropriate management regime with control exercised by those who re-seeded the reef become “fair game” for all and sundry.

To attempt to seed seafood animals into an area where they previously did not occur, or to attempt to increase size and density at an existing bed, is probably doomed to failure because of the interaction of the animals with their harsh environment, which

is in all likelihood the most significant factor which determines what species are found where, when, and in what numbers and at what size.

It is therefore recommended that re-seeding or stocking of the North Taranaki reefs with seafood species be considered, but only until hapu have control over the reefs via one of the management regimes discussed above (preferably a mataitai reserve), and only once sufficient feasibility work has been undertaken to show that such a move would be successful.

Dr Mike Patrick

6 August 2001

North Taranaki Coastal Kaimoana Survey

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2 Introduction and Background

Fletcher Challenge Energy (FCE) completed the exploration well Pohokura –1, 4.3 kilometres and the Pohokura-2 appraisal well 8 kilometres offshore of Motunui, North Taranaki in April and June 2000 respectively.

The drilling and testing of Pohokura-1 and –2 had been the subject of significant community interest. Some of that interest relates to the concerns of the effects the drilling and development operations have on the environment, particularly the coastal marine area and highly valued kaimoana of the North Taranaki reefs. These concerns had been exacerbated by three small condensate spills during well testing operations, particularly Pohokura-1. FCE responded rapidly to the spills and cleared them up without adverse effects on the natural environment.

Following the spill events from Pohokura-1 and prior to drilling the second off-shore well, the FCE General Manager Mr Rick Webber agreed to a request to survey the coastline.

FCE considered to options for meeting this commitment, to

1. Outsource to an Environmental Consulting company
2. To manage the survey, involving those Local Hapu/Iwi who requested the survey with third parties assistance as required

Option 2 was deemed as the appropriate choice as the main concern from the town hall meeting was in relation to the status of kaimoana (seafood) stocks.

FCE also took into consideration that such a project as the coastal marine survey would offer a number of opportunities for all parties involved, such as

- Cultural awareness and understanding
- Education
- Relationship building short and long term

3 Collaborative Approach

3.1 Steering committee

On the 18th October formal invitations to attend a meeting at the Plymouth International Hotel on the 26th October 2000 were sent to Ngati Mutunga, Ngati Rahiri, Otaraua Hapu Management Committee, Otaraua Hapu Trust and the Taranaki Regional Council (TRC). The purpose of this meeting was to discuss the FCE commitment to the marine coastal survey.

Representatives from all invited parties with exception of Ngati Mutunga attend the meeting. Further details of this meeting refer to 2.2

It was agreed that a steering committee be established to oversee this Marine Coastal Survey. This was agreed by consensus as was support for the project and that a member from their respective organisations were invited to sit on the steering committee.

Members confirmed as follows:

- Rachel Palmer FCE
- Tom Hunt Otaraua Hapu Trust
- Donna Eriwata Otaraua Hapu Management Committee
- Des Marsh Ngati Rahuri Hapu
- Geoff Otene FCE (facilitator)

Others from these organisations attended when they could .

Ngati Mutunga was approached , stated that they were supportive of the project but unfortunately unable to provide a representative to the meetings or resources to undertake the survey.

The role of the steering committee was as follows

- Development of the project scope
- Development of the project objectives
- Liaison between respective organisations
- Support for Project Leaders
- Support for Field Team members

3.2 Meetings

There were a number of meetings held throughout the project:

Date	Location	Key Issues
26 Oct 2000	Plymouth Hotel	<ul style="list-style-type: none"> • Background and purpose of meeting • Past survey information tabled by TRC • Scope and definition of survey • Draft objectives tabled • Project Action Plan • Project Budget
9 Nov 2000	Town & Country Club, Waitara	<ul style="list-style-type: none"> • Corrections to draft objectives • Resources required for project • Draft Proposed Coastal Marine Survey programmed tabled by the TRC • Video view from past Marine Survey completed in South Taranaki • Job Specifications for Project Leader and Consultant
01 Dec 2000	Ngati Rahuri Office, Waitara	<ul style="list-style-type: none"> • Appointment of Project Leader(s) • Appointment of Consultant for phase one
12 Dec 2000	Town & Country Club, Waitara	<ul style="list-style-type: none"> • Consultant tabled phase one report • Final project scope agreed • Final objectives agreed • Reports available to the public • Identification of particular reefs and shoreline locations • Field work activities and requirements • Field work Safety & Environment requirements and issues • Up to date of project status to be communicated to Ngati Mutunga • Appointment of Consultant for part of phase three
27 Feb 2001	Town & Country Club, Waitara	<ul style="list-style-type: none"> • Update to steering committee of project • Overview of phase two field work completed in January and February 2001 • Electronic presentation of field data obtained • Discussion on how Phase three will be formatted • Budget and costs to date
28 June 2001	Ngarue, Owae Marae	<ul style="list-style-type: none"> • A presentation of the whole survey was given • It was agreed to display the survey material at the Waitara Resource Centre. • It was agreed that all the objectives of the survey project had been met • It was agreed that FCE had met their commitment. • It was agreed that all information was available

		<p>to all parties and the public. The only confidential and IP rights were those of the data on species concentration. This information would be retained by the hapu.</p> <ul style="list-style-type: none"> • It was agreed that the project had huge educational potential • Kaumatua Jim Bailey stated that the project was a success and an educational taonga for the hapu..
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At all meetings, at least one member of each hapu group attended.

3.3 Decision Making Process

Decision making throughout this project needed to be structure in a manner that important issues such as mana (integrity), rohe (territory belonging to respective Hapu's), confidentiality, and protocols were always followed. This was achieved by good communication within the steering committee and support from the respective Hapus. Project specific decisions were addressed by the Project Leaders or in conjunction with the steering committee.

3.4 Project Schedule

A project timeline was used to assist with tasks, resources availability, key dates, commitments and effective project management .

The development of the project timeline by the steering committee had to be carefully planned as the fieldwork dates were defined by the two lowest tides of year 2001, these dates were the 10 –13 January & 7 – 11 February.

3.5 Project Budget

A project budget was allocated to this project from FCE with budget authority from FCE held by Rachel Palmer. The budget amount allocated for this project was based on a bench marked figure from an external consulting company quote and formal discussion with the Coastal Marine Survey Steering Committee. The budget allocated was approximately double that quoted by the Consultant. T was agreed that the objectives and benefits warranted this. Not withstanding this, a number of people from respective organisations volunteered their time throughout this project to ensure its success.

3.6 Project Leader Appointment

As with all projects there is a requirement for a project leader. The FCE template for a Project Manager was used to assist the Steering Committee in defining the requirements for a Project Leader for the Coastal Marine Survey. The job purpose was agreed on and as follows:

- To provide the required project planning and leadership to ensure a timely and effective outcome of the Coastal Marine Biological Survey in 2000/2001 in accordance with the objectives of, and in Co-operation with, the Steering Committee.
- To implement and oversee all field activities in a culturally appropriate manner.
- To act as the focal point for the preparation of all documentation for presentation to the Steering Committee, up to the completion of the survey.

Key results areas, key relationships, skills required desirable experience and qualifications were also agreed within the steering committee.

The position were placed within the respective Hapus and two candidates, Tom Hunt, Otaraua Hapu Trust and Des Marsh, Ngati Rahuri Hapu were appointed by the steering committee as Project Leaders as a Joint Venture Hapu partnership.

This joint venture agreement played an important role throughout the project as it assisted and supported in the decision making process.

The overall project was facilitated by Rachel Palmer, Sustainable business Services Manager, Fletcher Challenge Energy.

4 Project Objectives

FCE tabled the first draft of the project objectives at the meeting dated 26th October 2000. As this project was very specific the objectives had to take in a consideration important issues that achieved, FCE's town hall commitment and involvement of the Tangata Whenua and others of the community. After a number of discussions within the steering committee the final objectives were agreed on the 12th December 2000. The Project Leaders in conjunction with FCE were given the task to ensure the objectives were properly implemented. Objectives as follows:

Coastal Marine Survey Objectives

- Involve Tangata Whenua in specification and undertaking of survey where possible.
- To respect cultural sensitivity.
- To ensure that education is the basis of the project and that it is carried out in a way that it will benefit the entire community
- Make Information available to Tangata Whenua and others in the community
- To enable Fletcher Challenge Energy to contribute to Tangata Whenua and the broader community understanding of, and knowledge of, the biological status of the coastline

5 Project Scope

In conjunction with the project objectives, the project scope had to be identified. Again this involved discussion within the steering committee feedback and support from respective committee member organisations. The scope had to be completed in three phases and this was based on past history/available information, physical fieldwork operations and final reports, presentation requirements and possible long-term opportunities. The final Coastal Marine Survey Project scope was agreed on the 12th December 2000 and is as follows:

Coastal Marine Survey Project Scope

Phase One

- To provide a layman's summary review of past surveys undertaken on the North Taranaki coast.

Phase Two

- To understand a coastal marine biological survey that will include a stock take of existing resources with a Kaimoana focus.

Phase Three

- To produce a written and videographic record of the survey that will Make a comparative assessment of previous and current data. Assess methods of maintenance and regeneration.

5.1 Phase One

Available from the Taranaki Regional Council were considerable scenic information, reports, surveys, maps and photographs with respect to the biological oceanographic and physical nature of the coastline between the Onatiki and Mimi Stream.

The objective for phase one of the Coastal Marine Survey Project was to obtain the relevant information etc and produce a report to the steering committee that was written-up in layman's language for ready assimilation for the Tanga Whenua and local community.

A consultant was contracted to complete this task and the final document (refer to appendix) was presented to the steering committee on the 12th December 2000.

5.2 Phase Two

This part of the project involved a number of things to achieve the final objective, again always ensuring that communications, cultural issues and respect of Hapu Rohe played an important part in the decision making. Specific areas known from local Hapu and community members for Kaimoana sources were identified on maps. The fieldwork for this phase was agreed that the field crew would only work in knee height water levels in the defined reef areas.

A quick overview on how phase two was completed is as follows:

Planning

This task was completed by using the project timeline and focusing on the fixed dates for the low sea tides.

Resourcing

Resources for this project were from a number of organisations. The field members were divided into teams from the two Hapu.

A Marine Biologist from the Taranaki Regional Council assisted with Kaimoana identification guidelines on how past survey's had been completed.

FCE input with the Safety & Environment Management Plan and safety equipment to ensure the survey was conducted professionally and with due consideration to the safety of all involved.

Training

This was completed the day before the actual field work commenced, involving the use of a GPS, identification of kaimoana, documentation taking, emergency response, hazard identification.

Implementation

Prior to commencing the fieldwork each day, a toolbox meeting was held discussing work locations, hazards and control measures, rescue planning and cultural issues. All participating team members attended.

Data Assimilation, and Review

Data sheets were collected from the field team at the end of day. Information was reviewed by the Project Leaders and Marine Biologist and correlated onto a database. All data was input into excel spreadsheets.

Objectives of Survey Two Field Work

Due to the good weather conditions and the efficiency of the field crew, relevant information from the identified Kaimoana areas were completed during the 10 – 13 January low tide period. It was agreed to take advantage of the next low tide in Feb 7 – 11th to obtain further details. Again specific locations were identified which included areas that had been investigated from past surveys. This enabled the Project Team to compare Kaimoana status from the past to present and possible future. Implementation of this fieldwork was conducted in the same manner as Survey One Field Work.

Filming

Throughout this project, video coverage of field activities and specific tasks at the Waitara Community office were carried by a professional photographer. The Steering Committee agreed that the purpose for a video recording would be a very good communications tool for FCE Stakeholders and Hapu members to have a clearer understanding on how, why, who was involved and a visual record of the coast line at that particular time.

Data and Information Records

As per Field Work Survey 1 data was collated and entered onto a Microsoft Excel database. Opportunity was taken to train Hapu members on the use of the Microsoft Excel programme. An external computer-training advisor was contracted for one day to perform this task.

5.3 Phase 3

The purpose of the Phase 3 report was

- to compare the data obtained from these surveys undertaken in this project with previous surveys undertaken along the coastline in so far as this was possible.
- To recommend further survey work required.
- To make suggestions regarding management of resources to preserve and build stocks.

The report was contracted to Mike Patrick.

6 Results and Conclusions

The project was successfully completed with agreement that all objectives had been met.

A major benefit was the educational aspect of the project for all involved and it was agreed at a steering committee meeting that all information from the survey should be readily available for all to use, except specific location and abundance data of particular species. This was to remove the threat these resources being over harvested.

It was concluded that the learning from the project could be used in schools and within the hapu to continue the monitoring of the coastline.