

Parliamentary Commissioner  
for the Environment  
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# **INVESTIGATION INTO THE MANAGEMENT OF WHAKAKI LAGOON**

*Office of the*  
**PARLIAMENTARY COMMISSIONER FOR THE ENVIRONMENT**  
Te Kaitiaki Taiao a Te Whare Pāremata

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March 1993

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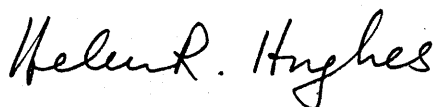
## **PREFACE**

The problems besetting Whakaki Lagoon are symptomatic of the consequences of actions taken in the past without recognising their effects. All too often the engineering solution to flood events was to straighten the stream, make a direct opening to the sea and get rid of water as fast as possible. The intent was laudable; the consequences were not!

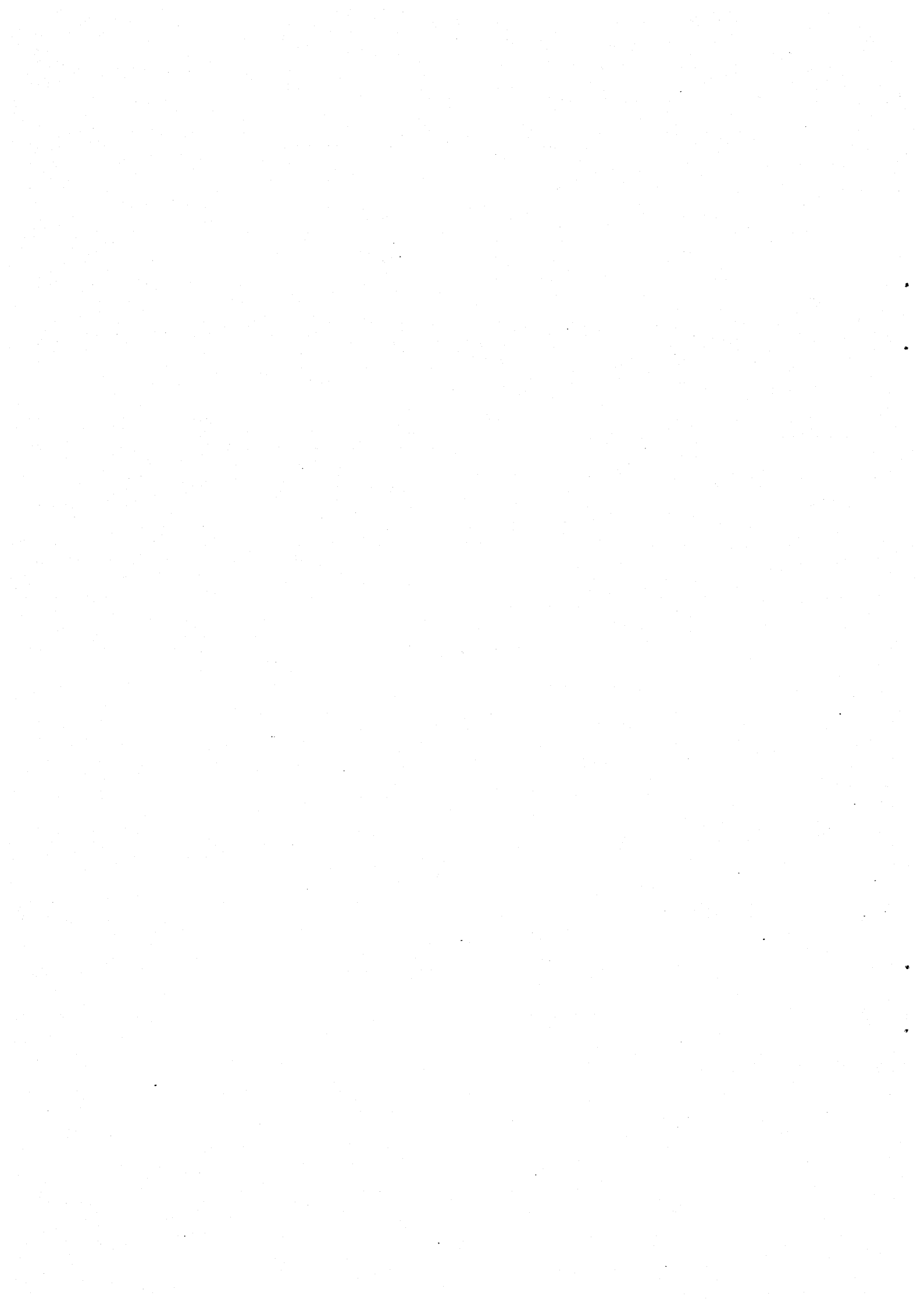
Fortunately, with more enlightened thinking, better ecological understanding and the thrust of the Resource Management Act 1991, the likelihood that any public authority would countenance reversing a drainage flow is very remote; nor is it so likely that the concerns of tangata whenua would be ignored.

All agencies and landowners in the region are agreed that some form of restoration of the lagoon system is desirable. This is in marked contrast to other areas of New Zealand where there is dispute as to ownership and who is responsible for management.

Given the goodwill in the Wairoa District, and with cooperation on all sides, I am hopeful that restoration of both tino rangatiratanga and the lagoon will be possible.



Helen R Hughes  
Parliamentary Commissioner for the Environment



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## 1.0 INTRODUCTION

### 1.1 BACKGROUND

Whakaki Lagoon is situated in the East Coast of the North Island, between Wairoa and Nuhaka, and prior to farmland development was part of an extensive coastal wetland network (Figure 1). Until the early 1900s exit of lagoon waters to the sea occurred only when flood waters naturally overtopped the sand bar, or tangata whenua opened the bar manually to facilitate subsidence of flood waters. Oral tradition tells of at least one direct opening made to the sea at Te Awa Waahi, but from at least 1899 to 1956 the artificial openings were usually made at Paakaa and flood waters would then exit via the Rahui Channel and Patangata Lagoon (Figure 2).

As from 1956, through the actions of successive central and local government agencies, flood waters have been released through direct sand bar openings, bypassing and effectively reversing the direction of drainage through the Rahui Channel.

Major ecosystem changes began to be noticed in the Whakaki Lagoon in the early 1970s, and were attributed by tangata whenua, recreational hunters, and Wildlife Service staff to the bypassing of the Rahui Channel. Submissions to Government to restore the Rahui Channel and Paakaa outlet began in 1973, and culminated in a proposal for joint funding from the then National Water and Soil Conservation Authority (NWASCA)<sup>1</sup> (60% contribution for half the total cost, with the Hawke's Bay Catchment Board to confirm the other 40% as the local share) and the Wildlife Service of the Department of Internal Affairs 50% of the total cost. However, the project lapsed in 1987, as the Wildlife Service contribution did not eventuate before that agency was disestablished.<sup>2</sup>

As part of this lapsed restoration plan the Trustees of Whakaki Lagoon, owners of the bed of the Rahui Channel and some of the immediately adjacent lands, were granted a water right in 1982 to discharge through the Rahui Channel.<sup>3</sup> However, until the Rahui Channel can be re-opened, the Hawke's Bay Catchment Board and its successor the Hawke's Bay Regional Council have had the right to continue discharging through the direct opening, and the obligation to maintain minimum and maximum levels set by NWASCA. In practice however, these bodies have not enforced the minimum level set by NWASCA, allowing continued dewatering and intrusion of salt water in Whakaki Lagoon.

In November 1990, the Maori Standing Committee of the Hawke's Bay Regional Council recommended that the issue of Whakaki Lagoon openings be taken up with central Government once again. A Whakaki Lagoon Working Party was established to review

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<sup>1</sup> NWASCA was established under the Water and Soil Conservation Act 1967. Its predecessor, the SC&RCC was established under the Soil Conservation and Rivers Control Act 1941. Both organisations were responsible for providing the Government, through the Minister of Works, with advice on water and soil management, and for providing overall direction for catchment authorities. Both organisations were serviced by the Ministry of Works.

<sup>2</sup> Restructuring of environment and conservation agencies including the Wildlife Service commenced in 1985, and Government reluctance to approve the Wildlife Service share has been attributed primarily to this restructuring process (D. Stack, letter of 14 Dec. 1992).

<sup>3</sup> Levels were set separately by NWASCA at max. = R.L. 11.8 and min. = 10.5 on 1/9/86. The water right to discharge through the Rahui Channel was first approved in November 1982. It expires in May 1995.

the situation,<sup>4</sup> and wrote to the Minister for the Environment in December 1991 seeking assistance in restoring the Paakaa outlet. The Minister declined the request but suggested that following the development of a management plan for the Whakaki Lagoon and its catchment, he would be prepared to reconsider a proposal, providing a significant national interest was determined.<sup>5</sup>

In May and June 1992, the Parliamentary Commissioner for the Environment received complaints from members of the Whakaki Lagoon Working Party about the management of Whakaki Lagoon. The issue, as presented to the Commissioner, involved the need to obtain funding to return Whakaki Lagoon opening regime to its traditional site at Paakaa, via the Rahui Channel which had been bypassed since 1956 and had since silted in. The bypass of the Rahui Channel through creation of the direct opening was said to have been initiated by the former Ministry of Works, and the subsequent direct openings of Whakaki Lagoon to the sea were held by complainants to be responsible for the decline in habitat for various species of cultural and recreational significance and loss of a traditional waterway.

In August 1992, staff of the Commissioner's Office visited the Whakaki area and met with interested parties to clarify the issues. They reported back to the Commissioner who decided to investigate the matter further under section 16(1)(c) of the Environment Act 1986.

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<sup>4</sup> Members of the Working Party consist of the Whakaki Lagoon Trustees (tangata whenua), the Hawke's Bay Regional Council, the Wairoa County Council, the Whakaki Drainage Committee, the Eastern Fish and Game Council, the Department of Conservation, the East Coast Conservation Board and various landowners.

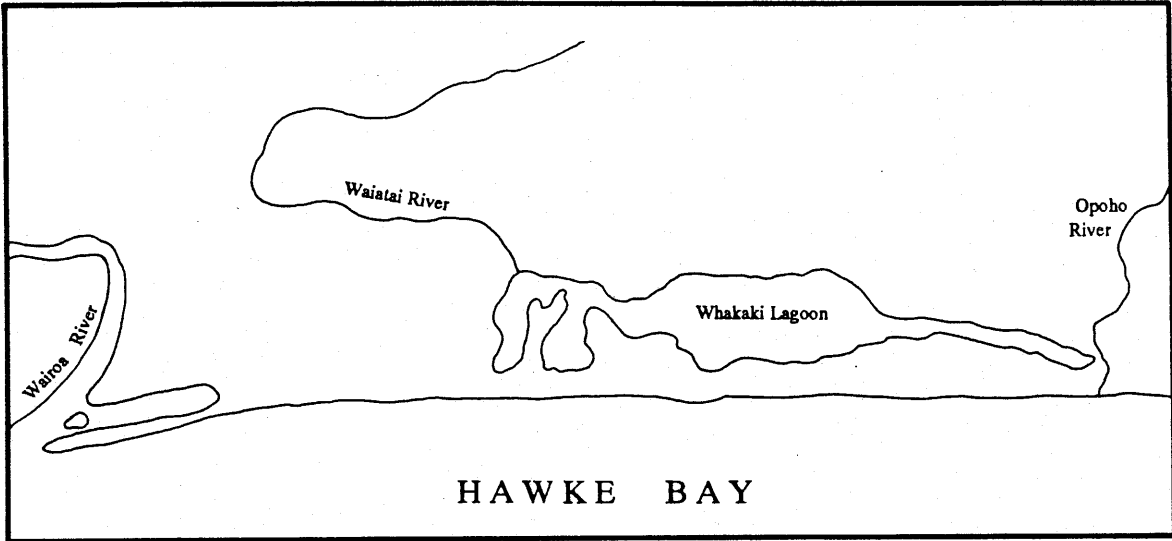
<sup>5</sup> Letter from the Minister for the Environment, 9 March 1992. However, a comprehensive catchment plan had already been pursued by the Hawke's Bay Catchment Board in 1980. Despite initial support by all parties, when details of ratepayer contributions became known, the plan was rejected by local landholders, and an attempt by the Wairoa District Council in 1991 to revive the scheme met a similar fate. The principal opposition was to the expense and perceived lack of landholder benefit of extensive planting in the wider catchment.



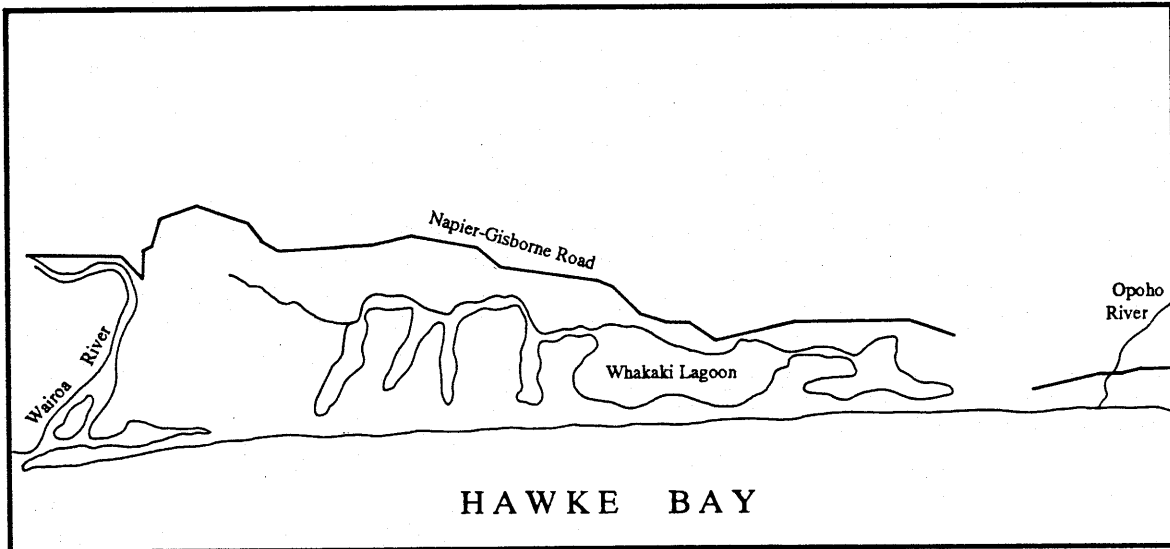
## 1.2 TERMS OF REFERENCE

The original terms of reference used by the Commissioner to investigate this issue are as follows:

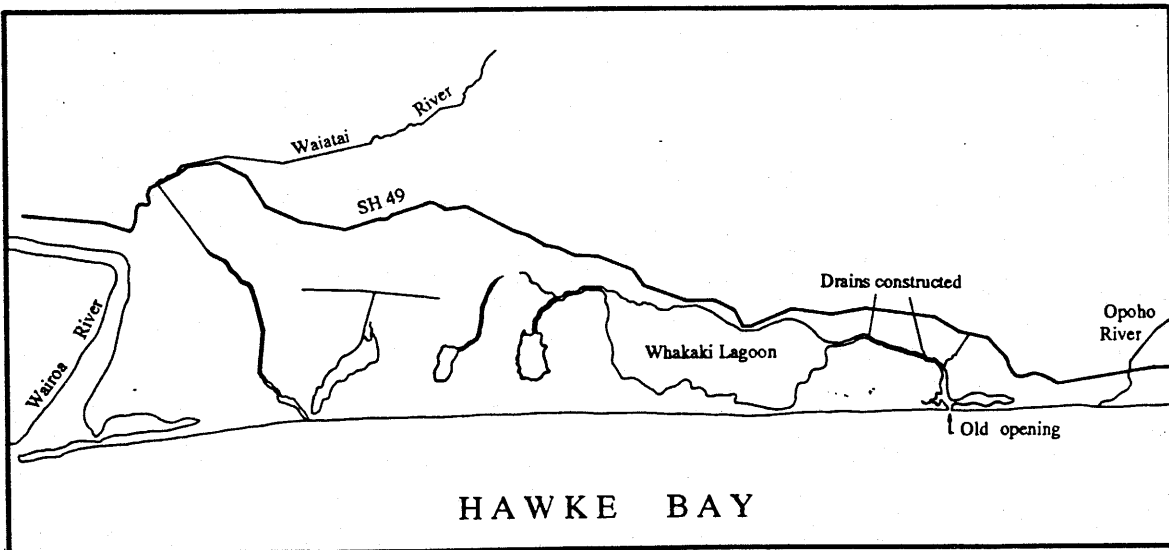
1. Determine whose responsibility it was for the original decision to bypass the Rahui Channel and whether there is still responsibility for its restoration by identifying:
  - (a) which parties sought, opened and maintained the direct opening from Whakaki Lagoon to the sea, and when;
  - (b) why was the direct opening sought and initiated;
  - (c) what was the extent of consultation with affected parties prior to decisions being made.
2. Determine in so far as possible the principal reasons behind the loss of the eel fishery and bird habitat in Whakaki Lagoon by investigating:
  - (a) the connection between the changed opening and changes in the physical and biological conditions in the Whakaki Lagoon;
  - (b) other contributing factors such as land use changes, wetland drainage, hunting and fishing pressure, and authorisations which allowed these changes.
3. Determine:
  - (a) what can be done to restore the old opening to the sea and maintain it as required over time;
  - (b) whether and how an eel fishery can be enhanced for the people of Whakaki Marae;
  - (c) whether and how habitat can be enhanced for preferred bird species of national significance;
  - (d) where the responsibility for the costs should lie.
4. Provide advice to Ministers, agencies, local authorities and other parties as appropriate and report to the House of Representatives.



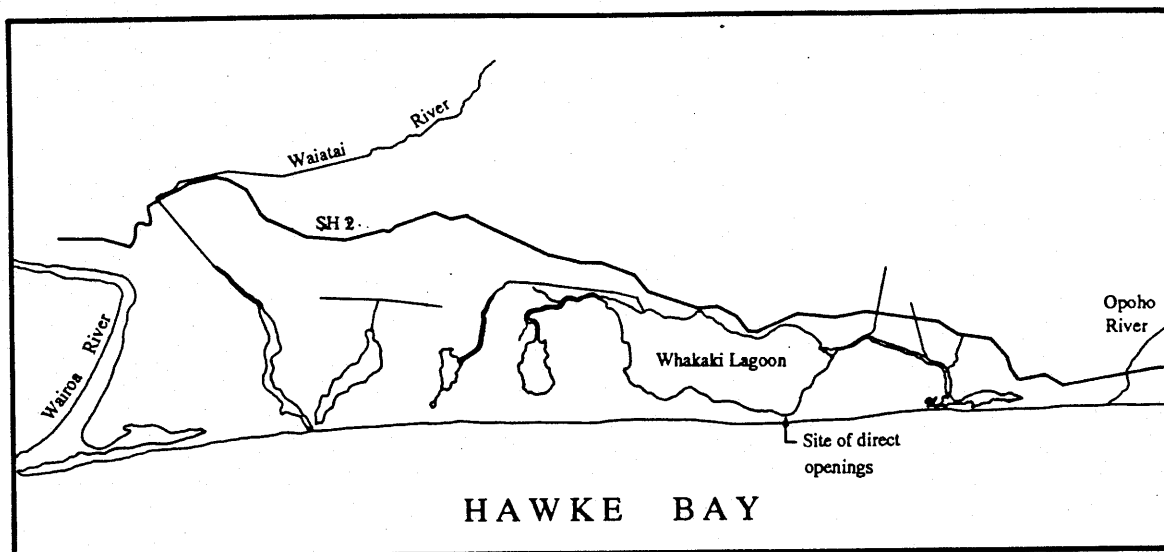
1874



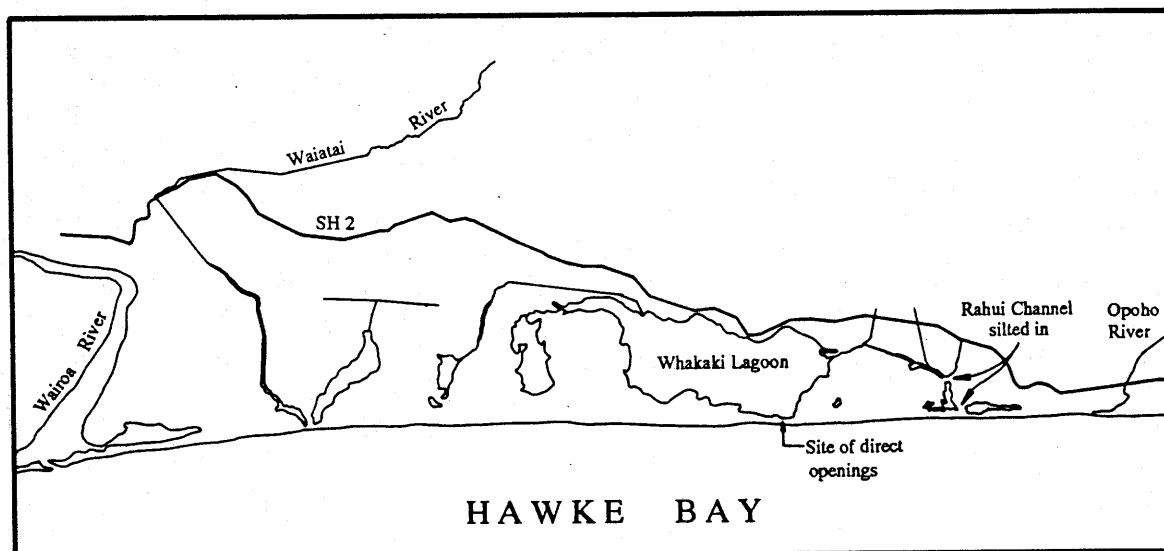
1899



1942



1978



1990

**Figure 1: Transformation of coastal wetlands between Wairoa and Opoho Rivers, 1874-1990**

Drawn by the Department of Survey and Land Information from maps and aerial photos on record.

**Note:** The originals of the 1874 and 1899 maps do not provide detail on smaller streams entering the Whakaki Lagoon system (eg Waikatuku, Ramarama, Tuhara), and the 1899 original provided no information on the location of the Waiaata River at that time.

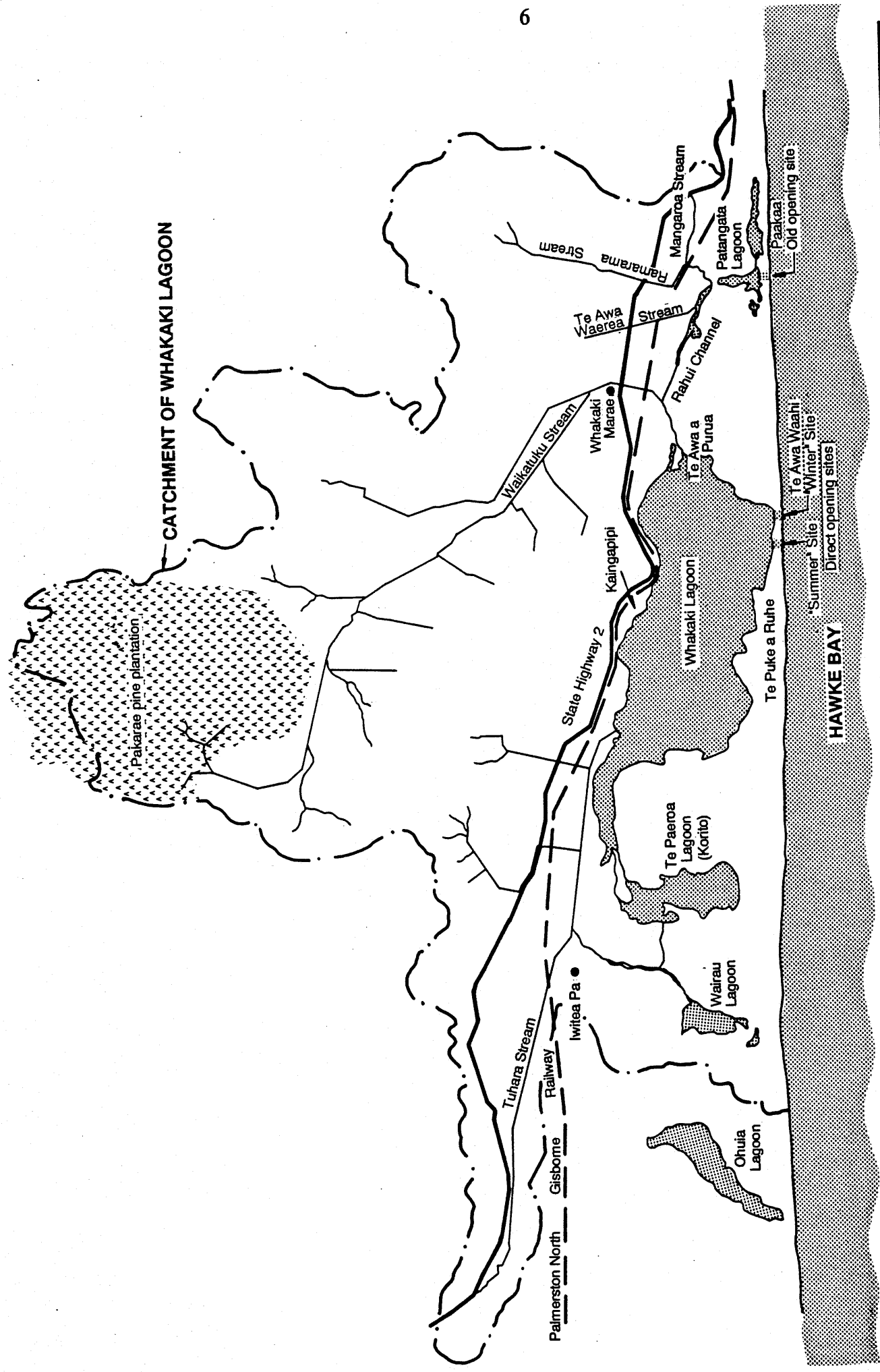
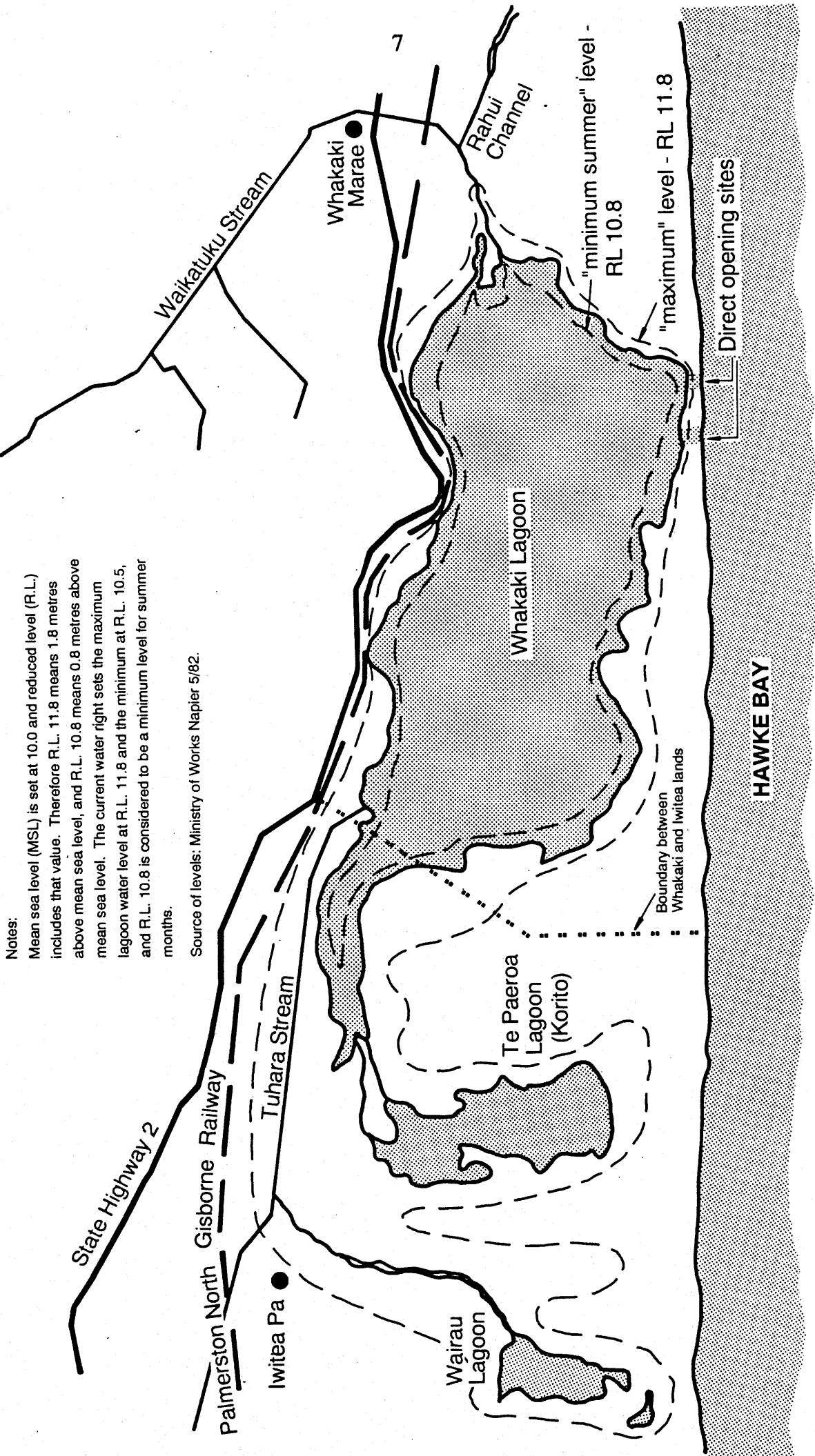


Figure 2: Map of Whakaki Lagoon, showing catchment boundary and major features.

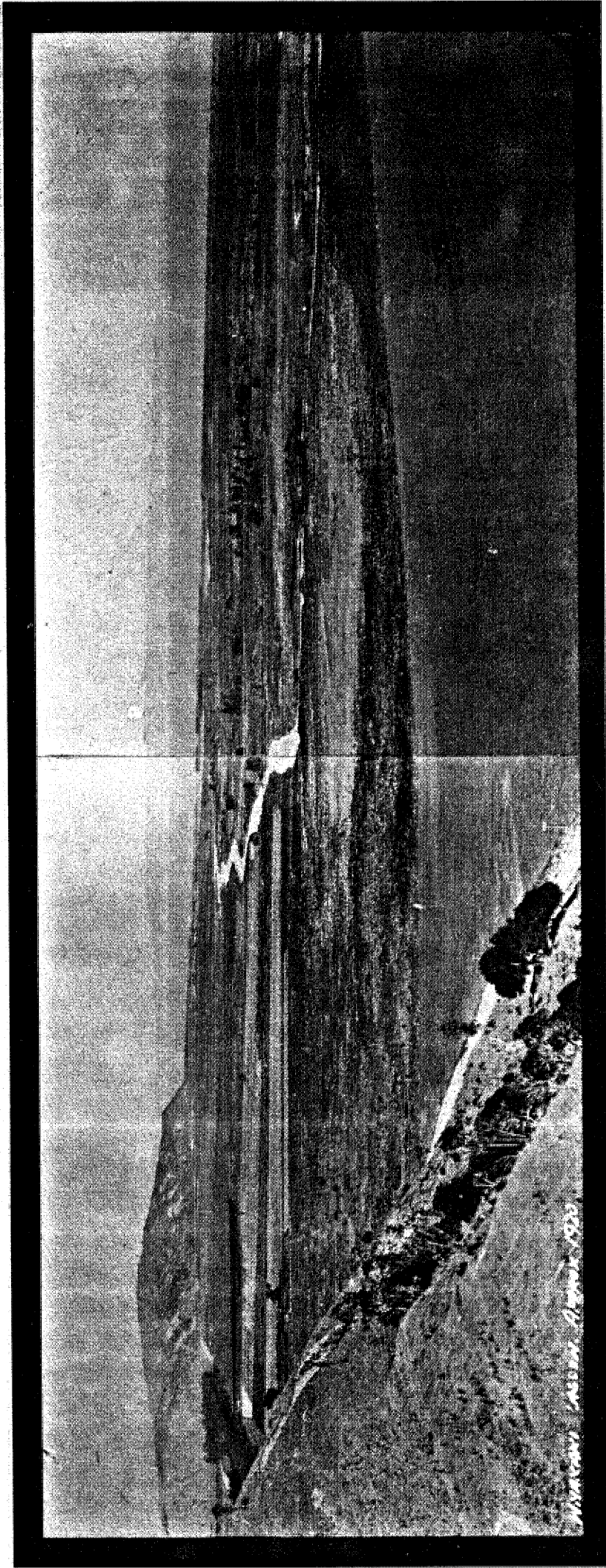


Notes:  
 Mean sea level (MSL) is set at 10.0 and reduced level (R.L.) includes that value. Therefore R.L. 11.8 means 1.8 metres above mean sea level, and R.L. 10.8 means 0.8 metres above mean sea level. The current water right sets the maximum lagoon water level at R.L. 11.8 and the minimum at R.L. 10.5, and R.L. 10.8 is considered to be a minimum level for summer months.

Source of levels: Ministry of Works Napier 5/82.

Figure 3: Boundaries of Whakaki Lagoon at "maximum" and "minimum summer" levels (RL 11.8 and 10.8)

**Figure 4:** Photograph of Rahui Channel and surrounds, ca. 1920



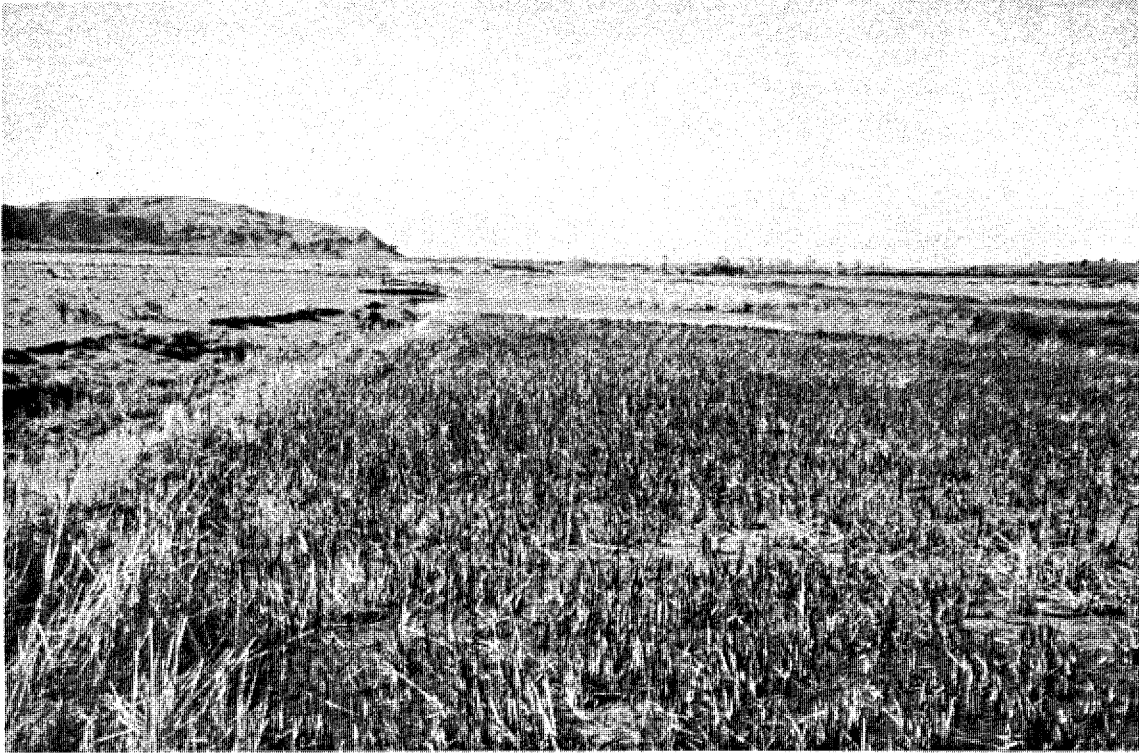
*Photo courtesy of J. Jardine, Wairoa.*

*This photo was taken approximately 35 years before the Rahui Channel was bypassed with the direct opening of Whakaki Lagoon to the sea and 70 years before the photos in Figure 5. Note the broad open channel, in comparison to the constricted channel visible in Figures 2 and 5. The first bend of the channel in the middle of the photo corresponds to the raupo-filled area of Figure 5a, and the last bend to the right visible in the distance corresponds to the silted-in area of Figure 5b. Whakaki Lagoon itself is out of sight to the right of the photo.*

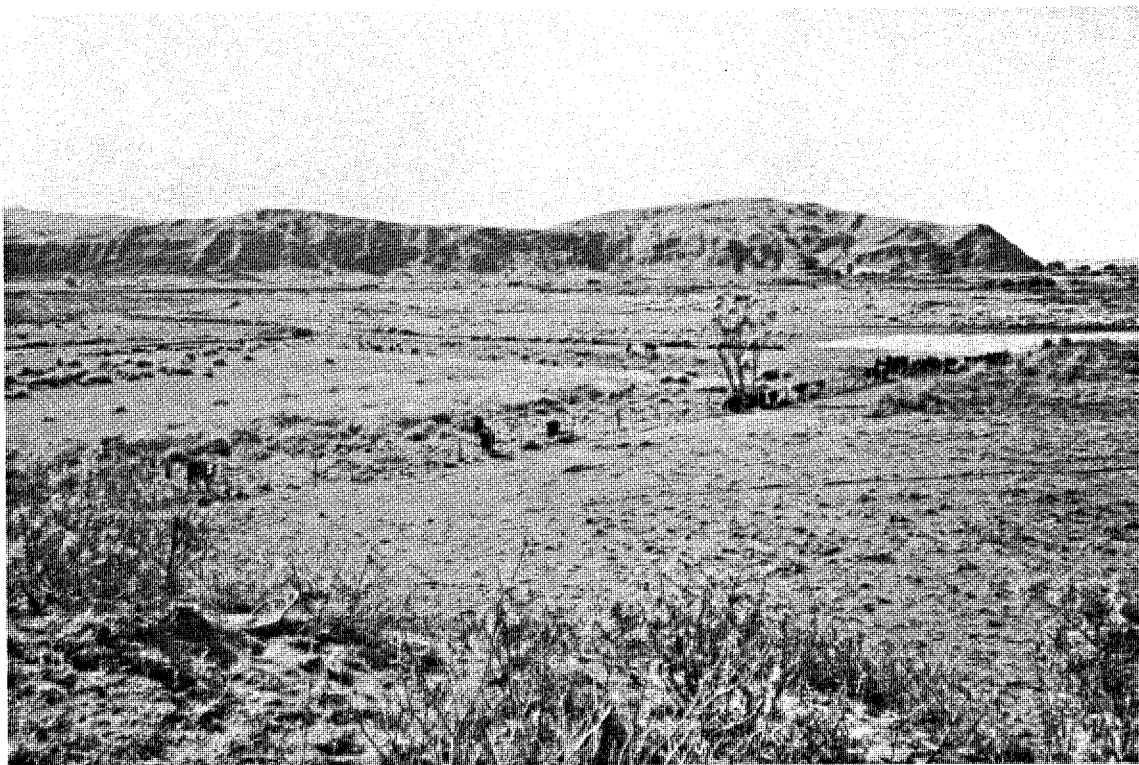


**Figure 5: Photographs of Rahui Channel and surrounds, 1992**

*Photos: Kirstin Woods*



(a) *Rahui Channel from bridge near the Waikatuku Stream, looking east. In the foreground the Channel is filled with raupo, where previously the water was open and deep.*



(b) *Rahui Channel at confluence with Ramarama Stream. The open water to the right connects to Patangata Lagoon; to the left (in middle distance) is previous Channel area now totally silted in.*





## 2.0 BYPASS OF THE RAHUI CHANNEL

### 2.1 PARTIES RESPONSIBLE

The direct opening of Whakaki Lagoon to the sea was made in the week beginning 21 July 1956.<sup>6</sup> While no precise identification can be made as to who promoted the opening, it was excavated following discussions between staff of the Ministry of Works (the District Commissioner); the Chief Engineer of the Soil Conservation and Rivers Control Council; the Resident Engineer of the Ministry of Works; the Hawke's Bay Catchment Board (the Engineer); staff of the Wairoa Country Council (including the Engineer) and various "settlers" (identity unknown).<sup>7</sup>

The Wairoa County Council and the Whakaki Drainage Board continued to maintain openings at the new site until 1962-63, when the Hawke's Bay Catchment Board took over. (Until 1962, the Wairoa County Council undertook the functions of a Catchment Board under the supervision of the Ministry of Works.) The Hawke's Bay Regional Council took over responsibilities from the Catchment Board in 1989.

The National Roads Board did not appear to have been directly consulted over the opening prior to excavation and did not agree to provide funding when approached for a subsidy.<sup>8</sup> Contributions are said to have been made by the National Roads Board after 1958,<sup>9</sup> but this information is not consistent with information contained on Ministry of Works files.

Table 2.1 provides an overview of funding contributions that have been made to Whakaki Lagoon openings since 1900. The bold line indicates the change-over from drainage through the Rahui Channel to drainage through the direct opening.

### 2.2 WHY THE DIRECT OPENING WAS MADE

No written records proposing the direct opening prior to excavation have been found. Later documents refer to flood relief and drainage improvement. While flooding in the Whakaki area appears to have been an issue for many years, documentation suggests that floods became worse in the 1950s, in part because the road and railway embankments interrupted the previous drainage course for flood waters. Following serious flooding

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<sup>6</sup> *Wairoa Star*, 15 August 1956.

<sup>7</sup> *ibid.*; District Ministry of Works file - District Commissioner to Commissioner of Works, 14 September 1956.

<sup>8</sup> Handwritten comment on memo from District Commissioner of Works to Commissioner of Works, 14 September 1956.

<sup>9</sup> County Clerk, Wairoa Country Council, 27 June 1963.

**Table 2.1: Contributions to the cost of opening Whakaki Lagoon**

DATE	Tangata whenua	Settlers/ Whakaki Drainage Board	Wairoa County Council	Central Gov't: National Roads Board	Central Gov't: SC&RCC, NWASCA	Hawke's Bay Catchment Board /Regional Council
until 1907	Full cost					
1907		2/3 <sup>1</sup>	1/3			
1932		2/3 <sup>2</sup>	1/3			
1946		1/3	1/3	1/3		
1956 direct opening		1/6	1/6		2/3	
1958-63		1/4	1/4		1/2 <sup>3</sup>	
1963-87					1/2	1/2 <sup>4</sup>
1987 to present						Full cost <sup>5</sup>

**Bold line indicates change from traditional openings via the Rahui Channel to direct openings through the bar.**

## Notes:

- 1 Contributions made by tangata whenua after 1907 would have been through rates.
- 2 Wairoa County Council agrees with proposals from "settlers" to fund more openings. Agree to fund 1:1:1 between settlers, Whakaki Drainage Board and the Council
- 3 It has been suggested that the National Roads Board made contributions from the late 1950s rather than SC&RCC, but this is not clearly documented in the files.
- 4 Openings were paid from "shingle royalties".
- 5 Since the advent of the Resource Management Act 1991, "shingle royalties" were replaced by a resource rental fund. Funding of Whakaki Lagoon opening costs is met by a general fund which includes but is not limited to revenue from resource rentals.

Abbreviations: NWASCA National Water and Soil Conservation Authority  
 SC&RCC Soil Conservation and Rivers Control Council

in 1956, the Wairoa County Council began to put pressure on the District Commissioner of Works to do something about it - even if that meant lowering the road.<sup>10</sup>

Protection of the road, Whakaki village and surrounding lands from flooding are all factors documented by the District Commissioner of Works when applying for subsidies for continued openings.<sup>11</sup> Documentation suggests that the District Commissioner of Works also saw some potential for further wetland drainage and farm development if low levels were maintained.<sup>12</sup>

Land clearance and development from the early 1900s to the 1950s contributed to heavy erosion and siltation in the area. Documentation suggests that silt was building up in the Rahui Channel in the 1950s, slowing down runoff of impounded water.<sup>13</sup> However, tangata whenua living in the area recall that the Channel was still working effectively in 1956 when the direct opening was made.

It was acknowledged by the District Commissioner of Works that the mouth of the Rahui Channel did give an effective opening when water levels flooded surrounding low lying country. However, when the water level was reduced to within the channel limits the amount of outflow was insufficient to maintain an opening. The direct opening provided for more rapid drainage to lower levels.<sup>14</sup>

## **2.3 EXTENT OF PRIOR CONSULTATION WITH AFFECTED PARTIES**

### **2.3.1 Consultation with tangata whenua**

Public meetings were held in Whakaki in 1954-55 to try and address general flooding problems. At these meetings, there was unanimous agreement that something should be done to control Whakaki Lagoon levels. Residents of Whakaki had already agreed to contribute to flood control measures on the Waikatuku Stream. In 1955, it was agreed that "a major scheme was needed to keep the lagoon at summer levels all year round".<sup>15</sup>

Residents of Whakaki, some of whom were present at the meetings, state that the opening proposal was discussed but no written record exists. It seems that the direct opening was presented as a way of addressing flooding problems, and that tangata

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<sup>10</sup> Wairoa County Council, Minute Book, meeting of June 1956.

<sup>11</sup> The District Commissioner represented both the National Roads Board and the Soil Conservation and Rivers Control Council at the District level. His file notes and memos indicate that he considered that the village, farmland and the main highway would all benefit from the direct opening.

<sup>12</sup> District Ministry of Works file, 21 May 1956.

<sup>13</sup> *Wairoa Star*, 15 August 1956.

<sup>14</sup> File of the Napier District Office of the Ministry of Works, 14 September 1956.

<sup>15</sup> Minutes of meeting held in Whakaki Hall, 27 April, 1955.

whenua were not presented with any alternatives.<sup>16</sup> As they remember, their pakeke (elders) were given a false impression of what the implications of the opening would be.<sup>17</sup> This could be supported by the fact that despite the verbal undertakings to keep the water in the Whakaki Lagoon at summer levels, there are references on Ministry of Works files to the lagoon being almost dry after the direct opening regime had been initiated.

Tangata whenua advise that up to 1956, Purua Solomon would have had the final say about Whakaki Lagoon openings. From July 1956, his involvement was no longer sought.<sup>18</sup>

### **2.3.2 Consultation with other affected parties**

As noted in section 2.1, it appears that the Wairoa County Council, Hawke's Bay Catchment Board, and some local landholders were consulted. However, minutes of a meeting of the Whakaki Drainage Board indicate that it was not consulted prior to the opening being made.<sup>19</sup> The National Roads Board does not appear to have been consulted, and no record was found of consultation with the New Zealand Railways.

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<sup>16</sup> H. Solomon, J. Smith, 13 October 1992.

<sup>17</sup> H. Solomon, pers. comm., Whakaki, 12 August 1992.

<sup>18</sup> Pers. comm., H. Solomon, J Smith, 13/10/92. However, the powers granted to the Wairoa Country Council for drainage works under the Counties Act 1920, the Land Drainage Act 1908, and the Public Works Act 1928 all suggest that there was little required in the way of permissions from the lagoon owners.

<sup>19</sup> Meeting of 26 July 1956.

### 3.0 HYDROLOGICAL ISSUES

#### 3.1 OVERVIEW

Whakaki Lagoon is a one of a number of lagoons east of Wairoa which have been formed as drainage sinks for catchment runoff. Water has been prevented from flowing into the sea by a barrier beach which extends from Wairoa to Nuhaka and by material built up along the shore by longshore drift.<sup>20</sup>

Until the early 1900s, water from as far west as the Waiatai River flowed east towards the Opoho River (see Figure 1). By the early 1900s, waters were manually released to the sea through the Rahui Channel by opening the coastal barrier at Paakaa.

Tangata whenua have always called the land east of Whakaki Lagoon "Whakaki ki raro" (lower Whakaki) on the understanding that it is lower than the area to the west, which is called "Whakaki ki runga" (upper Whakaki). They have always considered that the natural flow of water is from west to east, and that attempt to drain water into Whakaki Lagoon from the East can only fail because "you can't make water run uphill".<sup>21</sup>

Until 1956 the Rahui Channel was deep, wide, and hard-bottomed, and after openings were made at Paakaa it carried waters to sea at such a velocity that it could be heard roaring from some distance.<sup>22</sup> This channel had developed over a period when a larger catchment of water could be drained through it in times of flood (before the Waiatai and Ohuia waters (Figure 1) were diverted away to the west) and before intensive land development brought a huge silt load into the Channel.

By 1956, a number of factors are likely to have reduced the effectiveness of the Rahui Channel. These included:

- (a) the increased amount of drainage and flood storage desired by affected parties, the consequent decrease in desired maximum lagoon levels, and hence in the volume and velocity of water available to create and maintain the opening at Paakaa and flush out silt each time the lagoon was opened;<sup>23</sup>
- (b) increased siltation due to deforestation and land development; and,
- (c) the change in flow rates from moderate and constant to short and "peaky", resulting in more frequent flood events and adding to an already increasing silt loading.<sup>24</sup>

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<sup>20</sup> K. Smith, pers. comm., 1/3/93; G. J. Williams, 1982, p.2.

<sup>21</sup> H. Solomon, pers. comm., 15/12/93.

<sup>22</sup> H. Solomon & J. Smith, pers. comm.

<sup>23</sup> The duration of adequate flows is affected by the volume of water, and velocity is affected by the available height, or "head" of water above sea level.

<sup>24</sup> K. Smith, 1993, p3.: wetland drainage and land clearance had removed storage areas for flood waters and a mechanism for steady release of base flows over time.

Following the bypass of the Rahui Channel, the Ramarama Stream and other streams east of Whakaki (Figure 2), as well as the Channel itself, became subject to a steady build up of silt. The Channel still acted as a drainage outlet for the area, but with the flow in the opposite direction. As the Rahui Stream was no longer the main outflow channel for the lagoon, sediment was no longer flushed out to the sea. Sediment which dropped at the junction of Whakaki Lagoon and the Rahui Channel could not be removed by flushing through the direct opening, and has built up a delta which has spread into Whakaki Lagoon.<sup>25</sup>

Tangata whenua fear that if the Rahui Channel is not re-opened and continues to silt in, waters from the Ramarama and other nearby streams will have no outlet. A drain was dug in the early 1980s to drain waters into Whakaki Lagoon, but it silted up within 12 months. Tangata whenua see no sense in trying to maintain a drainage channel which attempts to drain water "uphill".<sup>26</sup> Tangata whenua are also concerned that if unless the Channel is re-opened, Whakaki Lagoon will eventually silt up as there would be no means to flush silt away. While consolidated material formed at the delta would not be flushed away during openings at Paakaa, fine suspended sediment would be.

## 3.2 RE-OPENING THE RAHUI CHANNEL

### 3.2.1 Influences on the effectiveness of the Rahui Channel

An engineering evaluation of options for maintaining minimum lagoon levels was undertaken in 1982.<sup>27</sup> The evaluation assumed that a channel could be designed so that material accumulating in the lagoon and channel would be flushed out providing material had not consolidated too much and was not held by vegetation. It also assumed that the channel would maintain itself and enlarge as more openings occur.

Tangata whenua recall that in 1956, the Rahui Channel was functioning well. Notes made by the District Commissioner of Works confirm that the Channel created an effective opening when surrounding low lying country was flooded. However, the Commissioner notes that once the decision had been made to open the bar when there was sufficient "head" above tide to do so, then there was insufficient volume and flow of water to maintain an opening unless tide and weather conditions were most favourable.<sup>28</sup>

It is unclear how far the relationship between present flow and siltation rates, combined with the current maximum of RL 11.8 might allow a new channel to operate effectively today. While lands at the western end of the lagoon are usually under water when the present maximum level of RL 11.8 is reached, tangata whenua point out that Whakaki village is not flooded. It is unclear whether the level of RL 11.8 will provide sufficient

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<sup>25</sup> G. J. Williams, 1982, p.2.

<sup>26</sup> H. Solomon, pers. comm., 12/2/93.

<sup>27</sup> G. J. Williams, 1982.

<sup>28</sup> Memo to the Commissioner of Works, 14 September 1956.

"head" of water to maintain an effective opening.<sup>29</sup> In addition, the reduction in depth and area of the lagoon, due to drainage and deposition, has decreased the volume of water available to maintain openings for as long as would have occurred until the 1950s.

The issue of siltation has been described as a "wildcard",<sup>30</sup> and without field studies and further modelling work it is difficult to ascertain with any accuracy the level of maintenance that would be required, or the likely life of the channel. The catchment is not as unstable as it once was and silt loadings should be considerably lower, but the ability of the Rahui Channel to be self-flushing once it is cleared is not assured, and between openings silt will continue to settle into the lagoon delta.<sup>31</sup> The previously self-flushing nature of the Rahui Channel existed when there was a significantly higher "head" and greater volume of water to do the work. This situation cannot realistically be recreated. A study of the water yields and sediment discharge from the catchments likely to be flowing into the Rahui Channel would help to clarify whether this option is feasible.<sup>32</sup>

In view of the possible difficulties in maintaining the Rahui Channel, an alternative proposal has been suggested involving the construction of a pipe under the beach at Paakaa (see Figure 6). The pipe would provide for constant discharge of waters in the eastern catchment including the Waikatuku Stream and would reduce the rate of siltation. Some removal of silt by drain diggers may be required. Fish juveniles and inanga would be able to enter the lagoon system.<sup>33</sup> The proposal is at present theoretical and has not been developed in sufficient detail for the investigation team to make a full evaluation. It does, however, merit further work by the Regional Council.

### 3.2.2 Implications

The benefits of re-opening the Rahui Channel include:

- (a) improved drainage for land at the eastern end of Whakaki, in particular in the catchment area of the Ramarama, Te Awa Waerea and Te Mangaroa Streams. The Patangata Lagoon could be developed and managed as a storage area.
- (b) possibly enhanced entry for glass eels and inanga at migration times;
- (c) possibly enhanced estuarine habitat for flounder, mullet, herring and shellfish;
- (d) decrease in the process of siltation taking place in Whakaki Lagoon.

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<sup>29</sup> H. Solomon, pers. comm., 1/3/93.

<sup>30</sup> The rate of siltation has not been ascertained. The Commissioner suggested in December 1992 that the Hawke's Bay Regional Council seek this information via core samples, but the Council disagreed on the need for data given the estimated expense of \$15,000.

<sup>31</sup> D. McBride, pers. comm., 2/3/93.

<sup>32</sup> K. Smith, 1993.

<sup>33</sup> K. Smith, 1993.

However, there are other possible effects:

- (a) without the periodic entry of salt water and given the inflow of nutrients, Whakaki Lagoon could become densely populated with fresh water weed species (not a problem for wildlife but possibly so for human access);
- (b) the possibility of having to open the Paakaa site more frequently than the present site (unless a pipe under the beach barrier is feasible);
- (c) the likelihood that floodwaters will drain from farmland more slowly through the Rahui Channel than through the direct opening;
- (d) the possibility of ongoing maintenance work being required.

Tangata whenua recall that before sea water was able to enter Whakaki Lagoon through the direct opening, there was more weed growth in the lagoon waters. As the weed provided a source of food for swans, tangata whenua do not consider that renewed growth will be a problem.<sup>34</sup>

It has been argued that with the extra distance the water would need to travel down the Rahui Channel and the consequent loss in velocity, the cuts through the bar would naturally close sooner in the face of southerly swells, and therefore more cuts would need to be made per year, raising costs. A decade ago it was estimated that with the Rahui Channel in operation, on average only one extra cut would be required per year.<sup>35</sup> However, since 1976 some 16 openings were made at the direct site before the water level had reached R.L. 11.8. The "head" of water was therefore less, and natural closure of the opening before full drainage was more likely. Thus the need for "extra" openings at the direct site may already have been created from time to time.

The average drainage time for the lagoon after use of the direct opening is about 2 days. Estimated drainage time for the lagoon using the Rahui/Paakaa exit is 2.5 to 15 days, depending on how deep and wide the Rahui Channel is dredged open.<sup>36</sup> A faster drainage time would not only benefit farmers on low-lying land by reducing the time that fields are under water, but it would also increase the velocity of the water through the Channel and assist in flushing out sediment and holding the cut open in the face of southerly swells against the bar. Although it would initially be more expensive, for long-term practical benefit a deeper and wider opening of the Channel is to be preferred.

The extent of maintenance work would depend upon the relationship between current rates of siltation and the amount and velocity of water flowing through the channel. The Hawke's Bay Catchment Board has estimated that maintenance costs could amount to \$158,000 over the first 6 years: an average of \$26,000 a year.

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<sup>34</sup> H. Solomon, pers. comm., 2/2/93.

<sup>35</sup> G. J. Williams, 1982 p.9.

<sup>36</sup> G. J. Williams, 1982, p 7.



### 3.2.3 The costs of re-opening the Rahui Channel

In 1984, the Hawke's Bay Catchment Board estimated that the cost of digging out the Rahui Channel would amount to \$360,000 and that the likely range of the estimate is plus/minus 25%.<sup>37</sup> The Hawke's Bay Regional Council has updated these figures as a rough order of cost to \$600,000 plus/minus 20%.<sup>38</sup> Estimates from local contractors range from \$150,00 to \$500,000. These apply only to the digging work, and do not include the costs of planning and administration.<sup>39</sup>

### 3.3 CONSTRUCTING A WEIR INSIDE THE LAGOON

The idea of building a weir inside the lagoon was proposed in 1982 when options for maintaining minimum levels were investigated.<sup>40</sup> Recent proposals by the Hawke's Bay Regional Council involve the design of a 100-metre-long earth and concrete structure inside the lagoon with a 150-metre-causeway on either side, angled back towards the bar. Openings would still take place in the bar itself - the weir would act only to maintain minimum lagoon water levels and elimination of salt water intrusion. It would be set at the minimum level of R.L. 10.8.

The weir would be set back so as to dissipate any waves coming through the opening. However as the height of spring high tide is estimated to be R.L. 10.7., sea water is likely to break over the weir in certain tide and weather conditions.

It is likely that sand and gravel would form a "flood tide delta" in the area between the bar and the weir, so that over time, more material may have to be removed when the bar is opened.<sup>41</sup>

While a weir could control salt water intrusion and minimum levels, there are other issues it cannot address:

- (a) silt will continue to build up into the lagoon at the mouth of the Rahui Channel, accelerating the process of infilling;
- (b) the Rahui Channel and Patangata Lagoon will continue to silt up. Maintenance of a drainage channel into Whakaki Lagoon would be necessary if drainage of affected lands is to be maintained;

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<sup>37</sup> G. J. Williams, 1984

<sup>38</sup> Figures were updated using the Construction Cost Index. An up-to-date re-evaluation of the proposal has not been completed. A rough order of cost is usually used to obtain rough estimates of the likely cost of options in order to decide on the appropriate option. However, detailed analysis and feasibility studies of particular options are not normally undertaken until a commitment has been made to carry that option through.

<sup>39</sup> pers. comm., Pryde, 7/1/92, Cram, 7/1/93 and Clarke, 15/1/93.

<sup>40</sup> G. J. Williams, 1982.

<sup>41</sup> K. Smith, pers. comm., 17/2/93.

- (c) it is not clear whether a means can be found to provide access over or around the weir for whitebait and glass eels at migration times.

As a rough order of costs, the Hawke's Bay Regional Council estimates that the cost of designing and building the weir would amount to \$200,000, plus/minus 10%. It is assumed that the weir will require little maintenance.

### **3.4 FEASIBILITY STUDIES**

The costings undertaken by the Council apply only to the design of the channel and the weir. They do not include the costs of investigating the environmental influences on either option, and their consequent effectiveness.

The costs of undertaking feasibility work to assess the effectiveness are estimated to amount to between \$150,000 - \$200,000.<sup>42</sup>

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<sup>42</sup> D. McBride, 15/2/93; N. Evans, 17/2/93 pers. comm.

## 4.0 WILDLIFE HABITAT LOSS

### 4.1 OVERVIEW

Prior to European settlement, the coastal plain which includes Whakaki Lagoon was naturally susceptible to floods, and all of the lagoons between Wairoa and Whakaki were linked in an extensive wetland system (see Figure 1). The previously abundant fish and bird population, and the tangata whenua who relied on them, were sustained by this large wetland system.

Over the last hundred years, this wetland was drained and converted to farmland, causing dramatic reduction of the seasonally flooded wetland. The traditional food production provided by the wetland (eels, other fish, birds, shellfish) was replaced by the produce that could be gained from pasture and cropland, and could be sold in a European-style market economy.

Direct openings of Whakaki Lagoon to the sea dating from 1956 are only the most recent phase of wildlife habitat alteration that has gone on for over a hundred years. When considering the historic causes of decline in bird and fish species in the Whakaki Lagoon area and possible remedies, one must take account of the significant contributing factors. These are summarised in Table 4.1.

**Table 4.1: Contributors to wildlife habitat changes in Whakaki Lagoon**

WILDLIFE HABITAT CHANGES	PARTIES			
	Local Community	Wairoa County Council	Catchment Bd./ Reg'l. Council	Central Government
Drainage of wetland, conversion of flood plain into farmland	action by farmers	promoter	schemes, subsidies	subsidies
Conversion of forest and bush to farmland, increase in silt and nutrients to waterways	action by farmers			subsidies
Destruction of natural stream channels (dredging, straightening, removing vegetation)	action by farmers, Whakaki Drainage Board	schemes, funding	schemes, subsidies	subsidies
Grazing and trampling of vegetation on lagoon margins by livestock	action by farmers			
Opening of Whakaki Lagoon direct to sea for flood control -- dewatering and salt water intrusion	demand for better drainage	funding	promoter, funding	promoter, subsidies

Tangata whenua report that species which formed a significant food resource for them prior to the bypass of the Rahui Channel included eels, carp, mullet, inanga, flounders, "herrings", kokopu, parere (ducks), wana (swans), pukeko, matuku (bittern), pipi and ngupara (mussel).<sup>43</sup>

Most available estimates of changes in the waterfowl population focus on swans. It has been estimated that their population is about 80-90% less than in the 1950s, and that there were 5,000 - 10,000 swans but then only several hundred to a thousand now.<sup>44</sup> Previously there was a permanent flock of grey teal which has been replaced by intermittent visitors, and bitterns are rare when once they were plentiful. Annual monitoring has shown that subsequent to earlier decline, most species are maintaining static populations, except for Canada geese which continue to increase.<sup>45</sup>

Probably about a hundred hunters use the Whakaki Lagoon area, harvesting up to 1,000 birds annually (swan, mallard and grey ducks). It is considered the most important waterfowl shooting area in the Wairoa District, and a regionally significant area for migratory waterfowl (albeit of diminished quality from earlier years).<sup>46</sup>

The eel population in the Whakaki area is estimated to be 75% less than what it was in the early 1950s.<sup>47</sup> Whitebait, bullies, and ngupara can no longer be found near the Whakaki Marae, and carp, flounder, mullet and "herrings" are found in much diminished numbers over a more limited local range.

The significant habitat changes for the major bird and fish species are summarised in Tables 4.2 and 4.3. Further information, particularly on eels, can be found in the Background Report.

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<sup>43</sup> H. Solomon 1992, p.1.

<sup>44</sup> H. Solomon, J. Smith, and J. Jardine, pers. comm.

<sup>45</sup> Stack 1991, p.4.

<sup>46</sup> H. Solomon and J. Smith pers.comm. 1992, and J. Jardine, speaking for the Central North Island Wildlife Conservancy Council at water right hearings in 1982.

<sup>47</sup> H. Solomon & J. Smith, pers. comm.

**Table 4.2: Summary of significant habitat changes for bird species in Whakaki Lagoon**

SPECIES	Salinity changes	Dewatering	Loss of wetlands, vegetation on margins	Other
Swans	possible stress on food species	MAJOR IMPACT. Up to 50% leave when dewatered	MAJOR IMPACT - loss of wetland habitat in region, nesting & shelter sites locally	Hunting pressure
Ducks	possible stress on food species	MAJOR IMPACT. Up to 50% leave when dewatered	MAJOR IMPACT - loss of wetland habitat in region, nesting & shelter sites locally	Hunting pressure (Grey ducks were easy to shoot and are now scarce)
Canada geese	not significant - feed on land	minor impact - prefer open water shelter during moulting season	minor impact on sand bar nesting area only - prefer open water & open pasture	
Waders, gulls, terns, shags	not significant	BENEFIT - feed on stranded fish, exposed mud flats	not significant	
Grey teal	SIGNIFICANT - freshwater species	SIGNIFICANT - loss of suitable feeding areas and food species	MAJOR IMPACT - require good wetland vegetation for nesting, shelter	
NZ dabchick	possible stress on food species	SIGNIFICANT - loss of suitable feeding areas and food species	MAJOR IMPACT - vegetated margins essential	
Bitterns, crakes and rails	possible stress on food species	SIGNIFICANT - distancing foraging area from shelter	MAJOR IMPACT - well vegetated wetland margins absolutely essential	Hunting pressure (Bitterns previously taken for food)

Table 4.3: Summary of significant habitat changes for fish species in Whakaki Lagoon and connecting waterways

SPECIES	Salinity changes	Siltation changes	Dewatering	Timing of openings	Loss of wetlands, vegetation on margins	Other
Eels (Short-finned)	minor impact - stress on food species	minor impact - some habitat filled in	minor impact - stress on food species	SIGNIFICANT - young need seasonal entrance from sea	MAJOR IMPACT - loss of wetland habitat	use of fyke nets, killed in drainage pumps
Carp (Goldfish)	MAJOR IMPACT - fresh to salt/ brackish in Whakaki	minor impact - some habitat filled in	MAJOR IMPACT - strandings, washed out to sea	not significant	not significant	
Mullet and 'herrings'	not significant	minor impact - some habitat filled in	MAJOR IMPACT - strandings, washed out to sea	not significant	not significant	
Flounder	not significant	possible impact - silt covering sand	MAJOR IMPACT - strandings, washed out to sea	possible impact on juvenile entry	not significant	stratification and deoxygenation?
Inanga	not significant	minor impact - some habitat filled in	minor impact - majority not in main lagoon	SIGNIFICANT - young need seasonal entrance from sea	MAJOR IMPACT - veg. on margins essential for egg laying	
Kokopu and bullies	not significant	MAJOR IMPACT - loss of sand, rocky bottom	minor impact - majority not in main lagoon	SIGNIFICANT - young need seasonal entrance from sea	SIGNIFICANT - provides shelter, some insect food	
SHELLFISH Ngupara, Pipi	possible impact -- saline changed to fresh in Patangata	MAJOR IMPACT - loss of sand, rocky bottom, clog filter feeding	not significant - Patangata does not dewater with direct opening	not significant	not significant	

## 4.2 SIGNIFICANCE OF RAHUI CHANNEL BYPASS AND CREATION OF DIRECT OPENING

Information on the basic parameters of water quality in Whakaki Lagoon (salinity, water levels, nutrient loading, siltation, turbidity) was assessed by the investigation team. Of these, the ones directly related to the creation of the direct opening are dewatering events and changes in salinity.

### 4.2.1 Water levels/ dewatering

The openings directly through the sand bar to the sea for flood control have reversed the natural water level patterns in Whakaki Lagoon. The normal pattern would have been high water in winter, draining gradually to lower level in summer;<sup>48</sup> now levels are allowed to drop at any time of the year if they approach or exceed R.L. 11.8.

There are a number of times in the past when the opening of the direct outlet has dramatically dewatered Whakaki Lagoon, on occasion so much so that a person could walk across it. Observations have been made in recent years of times when the aquatic plants were exposed, and seabirds came in to feed on stranded fish.<sup>49</sup> Dewatering has *not* solely been on account of the reputed blasting of the hard "sill" in the sand bar in the 1970s; written accounts of complete dewatering after direct opening of the sand bar date from 1957.<sup>50</sup>

Data is available on opening frequency (see Background Report) but not on how far the water levels receded nor how long dewatering lasted. In dewatering periods the water level retreats below the staff gauge used to record flood levels and accurate low level readings cannot be made.<sup>51</sup>

A recent vegetation survey of Whakaki Lagoon has reported that there is a healthy population of typical brackish water species despite dewatering events.<sup>52</sup> However, there is no detailed information available on the vegetation present in the lagoon before the bypass. One species sighted in earlier years, *Ruppia megacarpa*, could not be found in 1992. *R. megacarpa* is a "large robust perennial" species more likely to be found in "permanent" waters, whereas *R. polycarpa*, which is present there now, is a "small delicate annual" species more likely to be found in "temporary" waters<sup>53</sup>; this may reflect a significant vegetation change caused by dewatering events.

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<sup>48</sup> K. Hawkins, pers. comm.

<sup>49</sup> G. Willoughby, K. Hawkins, pers. comm.

<sup>50</sup> Memorandum from District Commissioner of Works, Napier, to Commissioner of Works Wellington, 1 March 1957, file PW 81/16, Wellington Archives.

<sup>51</sup> G. Willoughby pers. comm.

<sup>52</sup> de Winton et. al. 1992.

<sup>53</sup> de Winton 1992, p.6; Gerbeaux 1989, p.123.

Observations by Regional Council staff suggest that rather than desiccation, a much more frequent and significant result from dewatering is the "premature harvesting" of aquatic plants as Whakaki Lagoon levels rise again. As the water rises from below the weed bed levels, waves strike against the roots of plants which would normally be under water and dislodge the plants. Large rafts of freshly dislodged weed can be found washed up on the downwind shores of Whakaki Lagoon.<sup>54</sup> Maintaining a minimum water level which lies above the aquatic weed beds would prevent this large-scale reduction of biomass which could otherwise provide food and shelter for other aquatic species.

Dewatering has had a significant but unquantifiable impact on particular fish and bird species found (or which were previously found) in Whakaki Lagoon. These are summarised in Tables 4.2 and 4.3.

#### 4.2.2 Salinity changes

At the present time Whakaki Lagoon generally contains brackish water, and extremes of fresh and salt water occur in times of flood or tidal flow after direct openings. Other factors which can increase or decrease salinity include wave splash during storms, salt spray, evaporation, and rain. Fluctuations in salinity caused by floods and droughts are a natural feature of coastal lagoons.<sup>55</sup>

At high tide the sea can come into Whakaki Lagoon once the sandbar has been opened at the direct opening site and the lagoon drained. The length of time this occurs depends on how long the cut stays open; in a southerly this may only be a matter of days, but when there is a westerly the tide can flow in and out of Whakaki Lagoon for as long as 2-3 weeks.<sup>56</sup>

The impact of this on bird species cannot be separated from the impact of dewatering events. For fish species, however, anecdotal evidence indicates that salinity changes from the direct opening regime caused a change in the areas of Whakaki Lagoon and connecting waterways where predominately fresh, brackish, or saline waters could be found. Tangata whenua report that salt/brackish water species such as flounder and mullet used to live year-round and grow to maturity in the Patangata Lagoon area near where the old exits used to be made, but now they can be found only seasonally in Whakaki Lagoon near the new exits. Similarly, freshwater carp used to be found throughout Whakaki Lagoon, but now are found only in the western tributaries of Whakaki Lagoon and in the Patangata Lagoon area.

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<sup>54</sup> G. Willoughby HBRC, pers. comm.

<sup>55</sup> de Winton et.al. 1992, p.8.

<sup>56</sup> There have been two direct opening sites. The "winter site" at Te Awa Waahi has scoured through the hard pan so that the depth of the opening extends below sea level. This is partly due to the attempts to blast through the hard pan when the first openings were made. The "summer site" has not scoured to the same extent. In recognition of the dramatic effects of total dewatering, the Regional Council now opens the lagoon only at the summer site.



Both the currently used direct outlet and restoration of the old Paakaa outlet have the potential to allow direct human-induced intrusion of salt water to Whakaki Lagoon ecosystem, but the difference is that salt entering the Paakaa outlet can be diluted over the length of the Rahui Channel, whereas with the direct outlet salt enters directly into Whakaki Lagoon.

Available records of salinity in Whakaki Lagoon are summarised in Table 4.4.

**Table 4.4: Salinity readings, Whakaki Lagoon, 1984 - 1990**

YEAR	Days records taken	No. of readings	Range of salinity (ppt)	Average salinity (ppt)	Salinity levels (ppt)	common description of water
1984	11	31	1.0 - 31.0	7.5	0 - 0.8	fresh
1985	5	15	2.4 - 22.0	8.4	0.8 - 20	brackish
1986	4	12	1.5 - 11.0	4.6	20 ->	saline
1987	4	12	4.0 - 12.0	7.6	35	sea water
1988	1	3	9.2 - 10.3	9.6	40 ->	highly saline
1989	3	9	2.5 - 5.8	4.6		
1990	1	3	0.0 - 5.0	2.0		

Source of data: Porter 1991, Appendices. Three test sites; eastern, western, and staff gauge.  
Source of salinity ranges: Dr. C. Howard-Williams, pers. comm.



## 5.0 TREATY OF WAITANGI IMPLICATIONS

Maori tribes were guaranteed tino rangatiratanga over natural resources under the Treaty of Waitangi, and under the Resource Management Act 1991 decision-makers are required to take into account the principles of the Treaty.

The Waitangi Tribunal has developed principles as a means of providing guidance to the Crown and Maori on how to act in accordance with their Treaty responsibilities. The themes of **partnership** and **active protection** of Maori resources and cultural preferences have evolved through the Waitangi Tribunal and the Courts.

### 5.1 TANGATA WHENUA AND KAITIAKITANGA

The tangata whenua comprise members of the three hapu of Ngati Hine, Ngati Hinepua, and Ngai Te Ipu. The bed of Whakaki Lagoon and much of the immediately adjacent lands are Maori owned.

Owners of a substantial part of the bed of Whakaki Lagoon, from the eastern end towards the west, are represented by the trustees of the Hereheretau B2/L2 block, known as the Whakaki Lagoon Trustees, and are based at Whakaki Marae. The Trustees have been referred to in this report as the tangata whenua, as the Rahui Channel, the majority of the bed of Whakaki Lagoon, and the foreshore excavated to make the direct openings is owned by them, and the negative impact of bypassing the Rahui Channel has largely been felt by them.

Lands at the western end of Whakaki Lagoon, including a portion of the bed of the lagoon, are managed through the Whakaki 2N Incorporation. The marae of the owners is at Iwitea, and the people of Whakaki and Iwitea are closely related. The beneficial impacts of the direct opening (flood control) have been largely felt by the farming people of the Iwitea area, both Maori and Pakeha.

Whakaki Lagoon holds significant values for tangata whenua, who confirm that an important aspect in the management of their lagoon is their role as "kaitiaki":

*"The tangata whenua of Whakaki Lagoon desired a total way of life from this lagoon and its tributaries. Their ancestors are buried in several urupa around the perimeters of the lagoon. The spiritual connections are strongly bonded between the land, lagoon and people. The heritage bonds give tangata whenua their pride, their mana and their spiritual culture.*

*"... In these changing times where a natural order of nature is fast disappearing, we as kai tiaki (Trustees) of the environment should endeavour to maintain all natural resources. This is to ensure that future generations can grow up with a heritage that is a vital part of being a Maori."<sup>57</sup>*

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<sup>57</sup> Letter to Parliamentary Commissioner for the Environment from H. Solomon, 25 May 1992.

In order to fulfil their role, kaitiaki require recognition of, and/or support for, the following:

- \* *rangatiratanga* (recognition, and where possible restoration);
- \* *knowledge* (traditional, scientific);
- \* *resources* (people, equipment, funding).

From the early 1900s the ability of tangata whenua to act as kaitiaki for Whakaki Lagoon was gradually undermined. By the 1950s, their ability to take appropriate action in respect of the lagoon became virtually non-existent. An examination of history from 1900 to the present shows that all three factors necessary for exercise of kaitiakitanga were either removed or beyond the reach of tangata whenua at critical times (see Background Report).

As far as Whakaki Lagoon openings were concerned, the Trustees describe how, in the 1950s, their pakeke (elders) did not have the knowledge to predict the impacts of changing the lagoon opening site. They understood that the lagoon would be kept at summer levels all year round. As kaitiaki, they were concerned to retain the traditional values of the lagoon while addressing the more immediate flooding problems they were facing. Their initial consent to the changed opening regime was given without the full information they needed to fulfil their role as kaitiaki and thus protect their heritage.

It was only in the 1960s-70s when tangata whenua understood in graphic detail the consequences of changes occurring in Whakaki Lagoon, Rahui Channel and Patangata Lagoon that they attempted to assert their responsibilities as kaitiaki, and lobbied for a return to the traditional lagoon outlet. They also offered resources, for example financial assistance for an excavation through the delta forming between Whakaki Lagoon and the Rahui Stream, but public authorities were unwilling or unable to provide the additional resources to do the job.

While the aspirations of the tangata whenua may have changed since the early 1900s, they have remained firm in their resolve that their traditional waterways should be managed so as to provide them with physical and spiritual sustenance in keeping with their traditions.

## 5.2 CROWN AND LOCAL GOVERNMENT RESPONSIBILITIES

Under the Treaty of Waitangi, the obligation to provide active protection for tribal resource management control (*tino rangatiratanga*) and resources of particular value to the tribe (*taonga*) was a condition of government (*kawanatanga*), whether Crown or local, exercising its powers.

Over the years, the Crown has prevented tangata whenua from exercising their rangatiratanga and their role as kaitiaki by:

- (a) failing to provide for recognition of rangatiratanga in relevant laws and policies which guide decision-making at all levels of government;
- (b) actively promoting activities to the detriment of taonga valued by tangata whenua;
- (c) failing to contribute to restoration activities once the damage had been recognised.

As far as issues relating to Whakaki Lagoon are concerned, the tangata whenua have been treated as one of a number of interest groups rather than as kaitiaki with special status. Failure to provide adequate decision-making processes has meant that the majority of activities undertaken in the catchment have not taken into account their impact on tangata whenua or on their taonga.<sup>58</sup>

The Crown has actively contributed to activities in the Whakaki Catchment area which have had a detrimental effect. These included the building of the railway and road, which caused flooding and led to the creation of the new direct lagoon exit. Damage to habitat of culturally important species through wetland drainage and land development were directly encouraged by government policy and subsidies in relation to land development, particularly from the 1940s to the 1980s.

Actions of the Wairoa County Council, the Hawke's Bay Catchment Board and the Hawke's Bay Regional Council have also contributed to the loss of rangatiratanga by failing to maintain minimum water levels in Whakaki Lagoon in direct contravention of verbal agreements and the subsequent water right, and by failing to control the actions of individuals in the Whakaki Catchment which contributed to habitat destruction.

Under the Resource Management Act 1991 there is more scope for local authorities to contribute both to the return of a measure of control to the tangata whenua of Whakaki, and to the enhancement of the ecosystem of Whakaki Lagoon area. For example, section (6) (e) of the Act requires decision-makers to "recognise and provide for the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga" as a matter of national importance. Section 7 places an obligation upon decision-makers to have particular regard to kaitiakitanga. Section 8 requires decision-makers to "take into account the principles of the Treaty of Waitangi".

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<sup>58</sup> See the Soil Conservation and Rivers Control Act 1941 and the Water and Soil Conservation Act 1967.



## **6.0 DISCUSSION OF OPTIONS**

The Whakaki Lagoon issue may be categorised as a grievance under the Treaty of Waitangi which involves ecosystem degradation. Given the passage of time, full restoration of the ecosystem, species and landscape features valued as taonga by tangata whenua cannot be achieved but viable options for redress do appear to be available.

The criteria that options for redress need to meet include:

- 1. Restoration of tino rangatiratanga;**
- 2. Restoration of the hydrological regime;**
- 3. Restoration of taonga (e.g. wildlife species);**
- 4. Maintenance or enhancement of drainage;**
- 5. Maintenance of works over the longer term.**

The two principal engineering options that have been proposed over the years to address these issues are: restoration of the Rahui Channel and Paakaa outlet; and creation of a weir to address water level and salinity issues while maintaining the present direct opening. In the discussion that follows these will be termed the Rahui/Paakaa Option and the Weir Option for ease of reference.

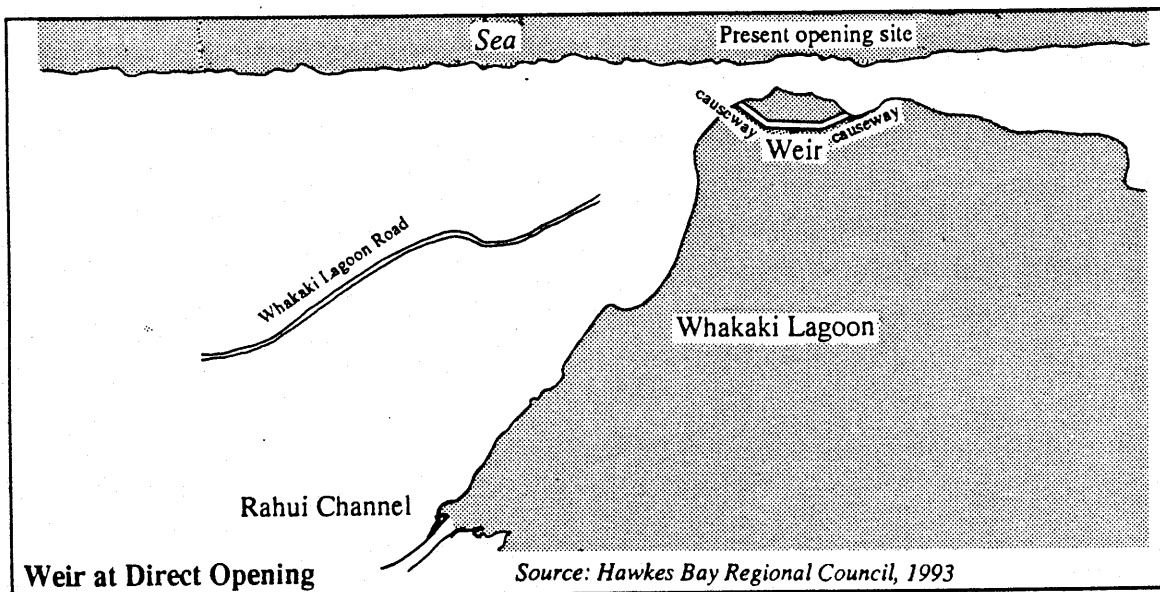
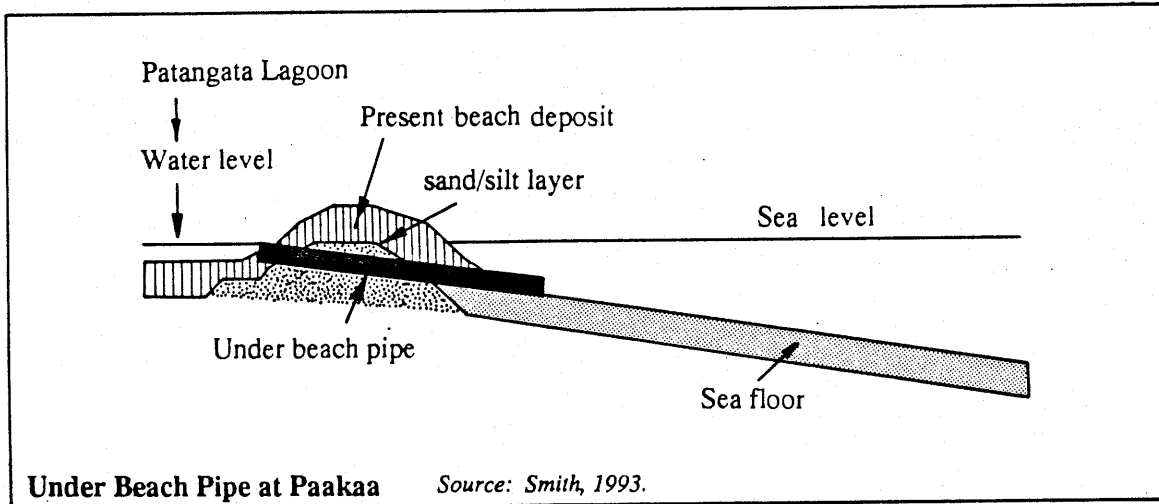
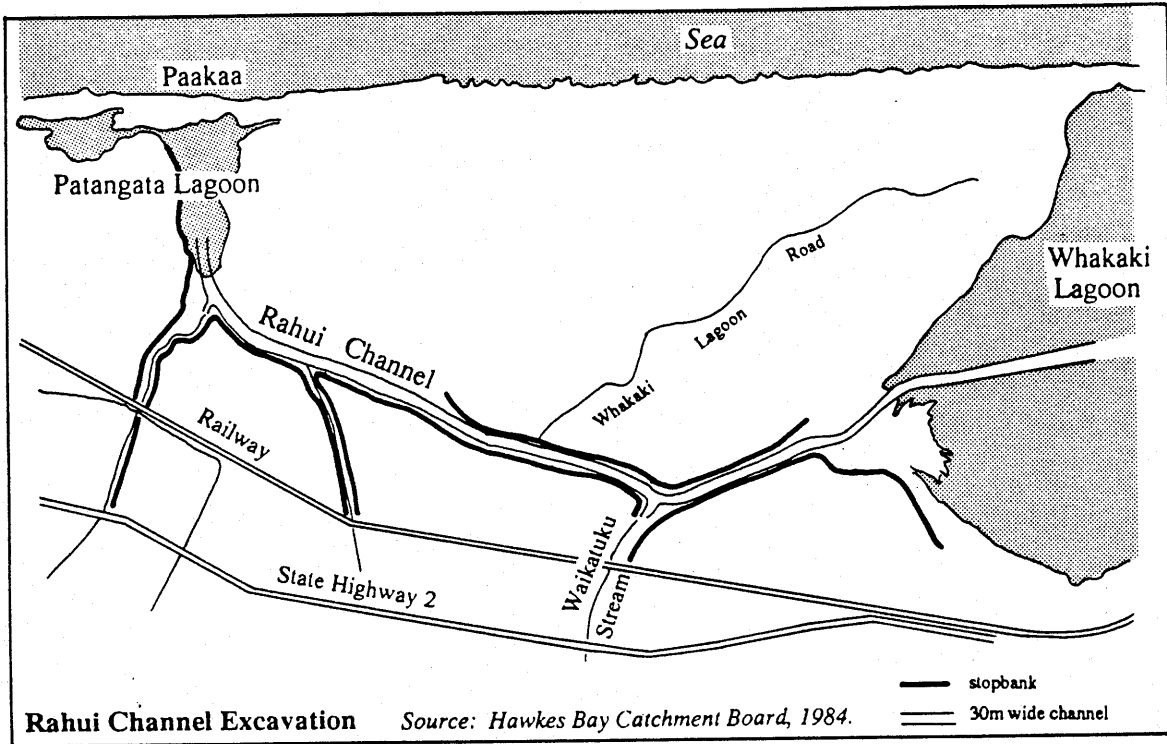
A third engineering option recently proposed - installation of a permanently open pipe under the beach barrier at Paakaa would maintain an open mouth all year round and provide a constant discharge system. This option is as yet too short of detail on practical application to be capable of analysis.

These engineering options are shown in Figure 6.

There have also been two distinct options discussed for enhancement of catchment vegetation so as to benefit wildlife habitats: retirement and planting of lagoon margins; and increased planting and retirement of riparian zones in the larger catchment. These will be referred to as "margin retirement" and "catchment control" respectively.

How the principal options may meet these criteria is discussed in the following sections.

Figure 6: Proposed Design for Rahui/Paakaa and Weir Options





## 6.1 OPTIONS TO ENHANCE TINO RANGATIRATANGA

Means need to be found to recognise the traditional kaitiaki role of the tangata whenua of Whakaki Lagoon and strengthen their role in management decisions so that their lagoon can be managed according to their tribal preferences. Possible measures include:

1. Full advance consultation and information sharing with the Whakaki Lagoon Trustees over all matters relating to Whakaki Lagoon, so that their management preferences are sought in good faith and they have the opportunity to grant informed consent.
2. Granting the Whakaki Lagoon Trustees the power to decide lagoon opening times, so that they have the opportunity to minimise lagoon water level impacts on wildlife during sensitive times of the year; and,
3. Obtaining advance permission from the Whakaki Lagoon Trustees for all visits to their lagoon, such as when bar openings are made and surveys are being undertaken, and keeping them informed of the outcome of those visits.

The decision making power granted to the Trustees would need to be subject to the proviso that the established legal maximum water level of R.L. 11.8 not be exceeded for a significant period of time, so as to protect adjacent landholders from undue flooding. Granting of the request would seem a reasonable action for the Council to take, considering the Trustees' status as tangata whenua and representatives of the owners of most of Whakaki Lagoon and its immediate surrounds.

The investigation team also considered ways of returning full management control to the Trustees, such as through provision of a hydraulic digger so that tangata whenua could undertake Rahui Channel rehabilitation and bar openings themselves. Restoring such control to them would be made relatively easy given the fact that a substantial part of the bed and much of the surrounds of Whakaki Lagoon are owned by them already, and that they hold a water right to discharge water from Whakaki Lagoon to the sea at the traditional Paakaa outlet where they wish the opening to be restored.

This option was discussed with the Whakaki Lagoon Trustees, who appreciated the advantages, but were concerned that a lack of adequate resources to maintain and administer the Channel rehabilitation over the long term would make the option untenable. The Trustees have therefore stated to the Commissioner that they prefer management options which keep the responsibility for Whakaki Lagoon water level control and Rahui Channel re-opening and maintenance with the Hawke's Bay Regional Council, with the proviso that works be done with the Trustees' prior agreement. However as a last resort, the Trustees did point out that if there is no change to the status quo and if they were provided with access to the appropriate machinery, they would consider undertaking the work themselves.

## **6.2 OPTIONS TO RESTORE THE HYDROLOGICAL REGIME**

Restoration of the hydrological regime requires the water ways draining the northern hills to flow east towards Patangata Lagoon. This means re-opening the Rahui Channel and ensuring the Ramarama Stream and other streams east of Whakaki flow once again in an easterly direction. The original regime can never be fully restored as waters that used to drain into the Whakaki Lagoon from the west have been diverted.

Floodwaters would have to be released by restoring the opening at Paakaa. It has been suggested that maintaining a flow of water in the Rahui Channel would help to reduce siltation and weed growth and that a possible way to achieve this is by a pipe under the beach with its outlet on the hard sea floor. This particular option requires further investigation to determine its feasibility. The ability to minimise sedimentation and ensure the Rahui Channel can draw flood waters is a critical aspect for determining whether the hydrological regime can be restored.

The Weir Option will not restore the drainage system to the east but it should reduce the salinity in the lagoon and eliminate dewatering events. Siltation will continue in the Rahui Channel. This will result in the necessity to open Paakaa at time of extreme weather conditions so that flood waters of the Te Awa Waerea, Ramarama Stream and Te Mangaroa are able to drain to the sea. As such, some digging and maintenance of parts of the Rahui Channel would still be required.

Irrespective of which option is chosen the flood holding capacity of the Patangata Lagoon system should be enhanced.

## **6.3 OPTIONS TO RESTORE WILDLIFE CONSIDERED TAONGA**

There are several types of habitat modification which are both immediately practical and have the potential to enhance the population of culturally preferred species. These are: cease dewatering events and reduce direct tidal exchange of seawater in Whakaki Lagoon through maintaining the minimum water level; retire more riparian vegetation from grazing; and increase controls on eel fishing. Longer term and more problematic are the retiring of the majority of the vegetation around the lagoon complex, and the retiring of riparian vegetation and increased planting of steeper slopes in the upper catchment area.

The engineering and habitat enhancement options, and their likely impacts, are summarised in Table 6.1. In summary, both the Rahui/Paakaa Option and the Weir Option could address water level and salinity issues and enhance habitat for major recreational waterfowl and carp, but both options fail to address the habitat improvements, which can be obtained only through margin retirement and catchment control.

The Weir Option would not enhance habitat for fish species other than carp unless further action is also taken. This would entail designing a mechanism to allow passage of migrating whitebait and eel young, and somehow providing habitat for estuarine

species previously resident in Patangata Lagoon, now transitory in Whakaki Lagoon, and unlikely to establish in a predominately freshwater lagoon separated from the sea by a weir.

The Rahui/Paakaa Option would be likely to restore the previously estuarine nature of the Patangata Lagoon and reopen the Rahui Channel as a habitat area, but if the head and volume of water available in the much altered lagoon system cannot keep the Channel "self-flushing" and sedimentation is not adequately controlled, use of the Channel as a drainage route for flood waters may not be tenable over the long term. Should a return to the direct opening regime be resorted to, some habitat enhancement gains may be lost.

If the status quo were allowed to continue, waterfowl population trends, now stabilised for major recreational species and on the increase for Canada geese, would probably continue over the short to medium term. Eventually, as the waterways and the lagoon itself shallowed and filled in, habitat for waterfowl would decline. Fish populations, now apparently stabilised in their new locations and lower numbers, would probably remain as such over the short to medium term, slowly declining as the waterways silted in over the longer term. The eel population may continue to decline, depending on harvest rates and access for juvenile eels into the system.

On balance, the Weir Option (*if* design features could be added to accommodate migrating fish) plus margin retirement would be better than the status quo for enhancement of habitat for culturally important species; but margin retirement and the Rahui/Paakaa Option would provide significantly greater habitat enhancement providing issues of Channel flow rates, sedimentation and maintenance can be resolved.

### 6.3.1 Margin retirement

Over the medium to longer term, the retiring of more of the Whakaki Lagoon margin from grazing and increasing controls on eel fishing are matters which the Trustees of Whakaki Lagoon could pursue of their own accord, with scientific advice, management planning and cost-sharing participation as appropriate from agencies. Much of this work would lend itself to a Conservation Corps type programme. For example, such a programme could be sponsored by the Whakaki Lagoon Trustees, or by the Wairoa District Council. The Department of Conservation (East Cape) has experience in running these kinds of programmes and could offer advice if necessary.

Regional and district plans and policies would also need to be revised so as to encourage and support these lagoon habitat enhancement activities, as well as to generally encourage and support the protection of wetlands and retiring of riparian vegetation.

**Table 6.1: Management options and outcomes: enhancement of bird and fish habitat in the Whakaki Lagoon**

OUTCOMES\	/OPTIONS	DIRECT OUTLET no weir*	install weir <sup>1a</sup>	PAAKAA OUTLET	NO OUTLET (floods)	Open bar for young fish entry <sup>2</sup>	Control eel fishing <sup>3</sup>	Retire lagoon margins	Catchment control <sup>4</sup>
Stable salt levels		(-)*	+ <sup>1</sup>	+	+				
Cease dewatering		(-)*	+ <sup>1</sup>	+ <sup>1b</sup>	+				
Restore some wetlands					+			+	
Decrease siltation								+	+
Enhance bird habitat <sup>5</sup>		(-)*	+ <sup>1</sup>	+	+			+	+
Enhance eel habitat		(-)	(-)	+	+	+	+	+	+
Enhance carp habitat		(-)*	+	+	+				
Enhance habitat for inanga, kokopu, bully <sup>5</sup>		(-)	(-)	+	+	+		+	+
Enhance habitat for flounder, mullet, herrings, shellfish		(-)	(-)	+					+

+ = positive impact likely  
(-) = negative impact occurring, or likely.

\* If direct openings through the bar are filled in again once the minimum level has been reached, some mitigation of current impacts may occur, but the effectiveness of this method will be highly dependent on weather and sea conditions.

1a Weirs are required to enforce minimum water levels. At the moment, although a minimum level has been legally set, openings are timed and recordings taken to enforce maximum water levels only. The "sill" at the "summer" opening site does not prevent dewatering events. A weir at the direct site would need to be high enough to prevent dewatering and exchange of ocean tides, but this would also block re-entry by migratory fish.

1b A buried weir at the Whakaki Lagoon end of the Rahui Channel has been suggested as a possible design feature if maintenance of minimum water levels in Whakaki Lagoon is required. A buried weir would not impede release of sediment or passage by fish.

2 For entry of young fish from the sea, the bar must be opened in spring during dark moon phases and times of flood for glass eels, after early spring floods for inanga (whitebait).

3 Involves reduction in harvest size, fyke net use. Protecting largest eels from harvest helps ensure that eels survive to breeding age to migrate to sea.

4 Revegetation of steep slopes, retirement and/or planting of stream and drain margins.

5 Species particularly reliant on intact wetland margins (e.g. bitterns, grey teal, NZ dabchick, also whitebait for egg-laying purposes) will not benefit from engineering options unless revegetation and margin retirement options are pursued as well.

### **6.3.2 Role and timing of a catchment control scheme**

In 1992 the Minister for the Environment advised that central Government would not favourably view contribution to the re-establishment of the Rahui Channel unless it were associated with a comprehensive management plan for the catchment. However, as noted in section 1.1, implementation of a catchment management plan has been attempted twice before to no avail. Pursuing upper catchment changes, in the face of twice proven lack of interest on the part of the landholders involved, would seem a recipe for further postponement of remedies for tangata whenua grievances and wildlife habitat decline.

Information available to the investigating team suggests that siltation and eutrophication have not been the major factors in wildlife habitat decline in Whakaki Lagoon, but that wetland loss, dewatering, and salinity changes have been. The team does not view a comprehensive catchment management plan, regardless of its desirability otherwise, as a necessary precursor to the rehabilitation of the wildlife habitat through maintenance of minimum water levels, and retirement from grazing and planting of lagoon margins.

In the interim, however, district and regional policies, plans and rules can be drafted so as to encourage planting and land management practices which would improve erosion control in the Whakaki Lagoon catchment. In particular, special attention will need to be given to controls to prevent major soil erosion when harvesting the large established pine plantation at the head of the Waikatuku Stream.

## **6.4 MAINTENANCE OR ENHANCEMENT OF DRAINAGE**

It is important that the rights of existing stakeholders are not compromised to the extent that new grievances are created while old grievances are being resolved. Of principal concern in relation to this issue are those landholders who have obtained, and come to expect, a certain degree of flood protection in the low-lying lands surrounding Whakaki Lagoon.

Holders of land above R.L. 11.8, in the lower Whakaki Lagoon catchment, which has been developed for agricultural and residential purposes, will not want drainage of these lands to be further compromised by any new option that may be pursued. Whether it was wise to drain and develop those lands in the first place, or whether it is reasonable to expect them to be well drained over the long term, is another issue. Currently the R.L. 11.8 level has legal status as an Order of the previous National Water and Soil Conservation Authority.

There is a possibility that the Rahui/Paakaa Option may mean slower draining of Whakaki Lagoon and surrounding lands after floods, or that it may necessitate more frequent bar openings to keep the lagoon level from exceeding R.L. 11.8, but the practical outcome cannot be known at this time with certainty. Further scientific research will not increase this certainty, but monitoring and anticipation of possible remedial actions is advised if the Rahui/Paakaa option proceeds.

The Whakaki Lagoon Trustees and members of the management committee of the Whakaki 2N Incorporation, whose lands are at the Iwitea end of Whakaki Lagoon, met recently and agreed that the Rahui/Paakaa option should be pursued. Should both groups continue to agree on the Rahui/Paakaa Option following the completion of feasibility studies, all Whakaki Lagoon flood control stakeholders could be consulted on the design of an appropriate programme to monitor the flood control effects and, based on monitoring results, invited to apply to change the relevant Regional Plan on the basis of any new conditions that may be required<sup>59</sup>. As the low lying lands on the Iwitea side of Whakaki Lagoon are likely to be the most affected, options that may need to be considered longer term are isolation stopbanking and pumping, or alteration of the maximum level, both of which could require compromise of actual or potential wildlife habitat quality in some areas.

There is also the separate but equally important issue of drainage for the holders of land to the east of Whakaki Lagoon around the Rahui Channel and its tributary streams. The creation of the direct opening and subsequent reversal of flow, creation of backwater, and rapid siltation in the Channel contributed to a worsening of drainage in this area. The Rahui/Paakaa Option would reverse this process whereas the Weir Option would ensure its continuation.

Both the Weir Option and the "do nothing" option of continuing the present management regime would maintain flood protection for existing low-lying farmland and cost much the same as it does now over the short to medium term. However, the Rahui Channel and Whakaki Lagoon would continue to accumulate sediment from the upper catchment, which would probably lead to impaired drainage and increased drainage costs for the low-lying lands over the longer term.

## 6.5 MAINTENANCE OF WORKS OVER THE LONGER TERM

The level of maintenance dredging required to keep the Rahui Channel open is presently unknown, and the effectiveness of the Rahui/Paakaa Option is in doubt if adequate maintenance funds are not available to keep the Channel open.

In the past there have been major siltation problems in Whakaki Lagoon in connection with land clearance and development activity in the upper catchment, particularly when government subsidies were available in the 1950s-70s. It is presumed by residents and local authorities that the catchment has now stabilised. Currently available data is not sufficient to demonstrate either the degree of maintenance dredging that would be required to keep a re-opened Rahui Channel free of accumulating sediment, nor the degree to which the upper catchment needs more planting or riparian strip retirement to control erosion. The Commissioner has advised the Hawke's Bay Regional Council that the rate of sedimentation should be ascertained.

It is also unclear whether, in the Weir Option, the structure will withstand the tendency of flood, high tide or storm waters to undermine or erode outside edges. Without a proper feasibility study, the usefulness of this option over time is therefore in question.

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<sup>59</sup> The minimum and maximum water levels are now deemed to be part of a Regional Plan under Section 368 of the Resource Management Act 1991.

## 6.6 RESOLUTION OF OPTION UNCERTAINTIES

The Rahui/Paakaa Option would appear to be the best option to redress, insofar as possible given historical developments, the loss of taonga and tino rangatiratanga by the tangata whenua of Whakaki, *but only if questions of technical feasibility and prospects for long-term maintenance can be addressed*. These questions should be adequately resolved for decision-making purposes by feasibility studies.

The Weir Option seems to offer a less costly way to improve habitat over the medium term for only some of the culturally important species but does not address future drainage problems around the Rahui Channel. It cannot be selected with confidence *unless technical issues are addressed in a feasibility study*.

Whether or not a successful migratory fish ladder can be designed to enhance the fish habitat aspects of the Weir Option (a major unknown, as so far the only New Zealand examples are inland, unaffected by coastal processes) is unlikely to be resolved in a basic feasibility study.

Questions of speed of flood water drainage and frequency of openings required in the Rahui/Paakaa Option cannot be answered absolutely by a feasibility study, although some indication can be given based on the theoretical "head" of water available. A monitoring programme designed by flood control stakeholders (discussed in section 6.4) would assist in fine-tuning the design and maintenance as required.

It is likely that whatever option is chosen, siltation of all waterways will continue and maintenance dredging will be required.

It is clear that the Whakaki Lagoon Trustees and the relevant agencies are supportive of margin retirement around the lagoon. Any uncertainties over location, timing, responsibilities and funding can be resolved in a jointly prepared management plan.

Catchment controls are likely to remain ad hoc unless further guidance and incentives are provided to landholders. Catchment-wide planting and retirement schemes have twice been rejected by landholders, so a different approach is required. Opportunities exist for the district and regional councils to encourage such works over the longer term in policies, plans and rules; but the outcome of such an approach cannot be known at this time.





## 7.0 CONCLUSIONS AND RECOMMENDATIONS

### 7.1 CONCLUSIONS

This investigation has confirmed that the tangata whenua of Whakaki have suffered a loss of control over Whakaki Lagoon management and a decline in culturally significant food resources, which amounts to **loss of tino rangatiratanga and taonga, contrary to the principles of the Treaty of Waitangi**. This loss was caused in part by:

- (a) Crown action in causing flooding problems through raising of road and rail lines, creating a new lagoon exit in 1956 to alleviate flooding problems, encouraging wetland drainage and soil erosion through land development subsidies, enacting past legislation which failed to recognise Maori and ecosystem values, and failing to fund subsequent restoration initiatives once the damage had been recognised;
- (b) Actions by the Wairoa County Council, Hawke's Bay Catchment Board and Hawke's Bay Regional Council in draining Whakaki Lagoon but failing to maintain minimum water levels in direct contravention of verbal agreements and a subsequent water right and NWASCA water level order; and,
- (c) Failure by agencies to adequately control activities in the Whakaki Lagoon catchment that led to wetland drainage, land clearance, straightening of streams, destruction of marginal vegetation, and giant-discing in unstable soils, which contributed to habitat destruction.

What has taken place in and around Whakaki Lagoon is a microcosm of what has happened in New Zealand as a whole, and is a reflection of the "pioneer" values that shaped the development of this country. Reversal of many of these changes is not practical, as present generations also wish to retain the farm development and drainage control benefits that were gained. However, **practical measures can still be taken to prevent further degradation of the Whakaki Lagoon ecosystem, restore greater tangata whenua control in resource management, and enhance the diminished resources that remain.**

There are three main remedies for the grievances which have been documented in this report: restoration of greater tangata whenua control in the management of Whakaki Lagoon; restoration of the hydrological regime and enhancement of the ecosystem for species of cultural value. None of these remedies alone will suffice, nor will one necessarily result in the others. All must be addressed together, in good faith, by the Crown and local authorities.

Under the principles of the Treaty of Waitangi and the provisions of the Resource Management Act, the Crown and local government have an obligation to take measures to restore tino rangatiratanga and the Whakaki ecosystem and enhance the environment for future generations. The Waitangi Tribunal has made it clear that the righting of past wrongs should not create new wrongs, and recommendations have been devised with this principle in mind.

## **7.2 WHO PAYS?**

Local government should not be required to bear the full cost of remedying actions which were principally promoted by the Crown through its policies and institutions. The Crown, as principal Treaty Partner, is responsible for ensuring that redress is provided in accordance with the principles of the Treaty of Waitangi.

A sharing of the costs of providing redress across all levels of government, in recognition of the contribution they have all made to the degradation of the ecosystem of Whakaki Lagoon, seems most appropriate. Tables 2.1 and 4.1 (see pages 12 and 21) summarise the historic contribution of the responsible parties.

Three stages of expenditure are required: feasibility studies; construction of works; and long-term maintenance. It is envisaged that the Hawke's Bay Regional Council, in order to discharge its functions under Section 30 of the Resource Management Act 1991, undertake and fund the feasibility work required to ensure that the Whakaki Lagoon Trustees are able to make an informed and responsible decision on their preferred option. Such work would involve studies of the likely impacts of sedimentation, hydrological flows and coastal processes on the proposed engineering options. Cost-sharing between the Crown and the Hawke's Bay Regional Council would be necessary for stage two; that is the final design and construction of the preferred option. Long-term maintenance should be borne by the local and regional beneficiaries, with works performed by the Regional Council on their behalf.

It may be possible for the Hawke's Bay Regional Council to obtain funding assistance in the form of a Resource Management Subsidy through the Ministry for the Environment. Subsidies are intended to assist councils to assess options for managing natural resources of regional significance. Such assistance could support the development, in conjunction with the tangata whenua, of a management plan for Whakaki Lagoon and the wider catchment area and incorporate the feasibility work required to allow the tangata whenua to identify appropriate management options.

## **7.3 TIMING OF IMPLEMENTATION**

Two steps should be initiated immediately:

Stage I:

- (a) feasibility studies on the impacts of sedimentation and hydrological flows on the proposed engineering options;
- (b) the Whakaki Lagoon Trustees, with the assistance of Hawke's Bay Regional Council, the Department of Conservation and the Eastern Fish and Game Council, should take steps to develop a management plan for Whakaki Lagoon so that defined tasks and priorities can be identified. The investigating team understands that the Trustees are already taking such steps. Following the development of a plan, work such as planting, perhaps with the assistance of a Conservation Corps or a similar programme, could take place.

## Stage II:

- (a) Following completion of the feasibility studies the Whakaki Lagoon Trustees should be informed by the Hawke's Bay Regional Council of the results of the studies and a decision made on the preferred option. Once an option has been agreed to, the Hawke's Bay Regional Council should proceed with detailed plans and apply to the Minister of Justice for a subsidy to assist with works necessary to restore Whakaki Lagoon.
- (b) Enhancement of lagoon margins should commence possibly with the assistance of a Conservation Corps or similar programme.

Accordingly, the Commissioner makes the recommendations set out in the following section.

## 7.4 RECOMMENDATIONS

### To the Minister of Justice

1. That the Crown recognise that it has directly contributed in a significant way to the loss by the people of Whakaki Marae of tino rangatiratanga over Whakaki Lagoon and tribally important taonga through:
  - (a) causing flooding problems by raising of road and rail lines;
  - (b) creating a new direct exit from Whakaki Lagoon and bypassing the Rahui Channel in 1956;
  - (c) encouraging wetland drainage and soil erosion through land development subsidies;
  - (d) past enactment of legislation which failed to adequately recognise Maori and ecosystem values; and,
  - (e) failing to fund subsequent restoration initiatives once the damage had been recognised.
2. That in recognition of the Crown role in the loss of rangatiratanga and taonga in relation to Whakaki Lagoon the Crown, **either**
  - (a) agree in principle to pay the majority share to fund works sufficient to enhance habitat in Whakaki Lagoon for wildlife of significance to tangata whenua, such that:

- (i) Whakaki Lagoon water levels are maintained between R.L. 10.8 and 11.8;
- (ii) the current exchange of tidal seawater into Whakaki Lagoon is stopped when the bar is opened for flood control purposes;
- (iii) migratory fish species previously abundant in Whakaki Lagoon are able to enter the lagoon as juveniles;
- (iv) flood control and drainage is maintained or enhanced, both for the eastern and western ends of Whakaki Lagoon; and,
- (v) works are capable of providing benefits over the long term;

and agree that, according to statutory obligations and tangata whenua preference, the subsidy be granted to Hawke's Bay Regional Council as the agency that will undertake the work, or

- (b) agree to enter into direct negotiations with the Whakaki Lagoon Trustees on resolution of their Treaty grievances with respect to Whakaki Lagoon.

#### **To the Minister for the Environment**

- 3. That favourable consideration be given to an application that the Hawke's Bay Regional Council might make for a Resource Management Subsidy to assist with management planning for Whakaki Lagoon and its catchment area (including the identification of appropriate management options).

#### **To the Minister of Youth Affairs**

- 4. That favourable consideration be given to any request to establish a Conservation Corps programme in the Wairoa District that could assist the Whakaki Lagoon Trustees and restoration work on Whakaki Lagoon.

#### **To the Hawke's Bay Regional Council**

- 5. That prior to final selection of the design for construction works best able to meet the criteria in Recommendation 2 (a), the Hawke's Bay Regional Council fund feasibility studies looking at both the Rahui/Paakaa Option (including the possible under beach pipe) and the Weir Option.
- 6. That the Council present the results of these studies to the Whakaki Lagoon Trustees for their informed consent and final indication of preferred option and design features prior to the Crown and the Hawke's Bay Regional Council funding and undertaking the option chosen.

7. That the Council agree in principle to fund its share of:
  - (a) the restoration works referred to in Recommendation 2 to the Minister of Justice;
  - (b) ongoing costs of monitoring and maintenance.
8. That the Council henceforward abide by the conditions of the water right so as to prevent the waters of Whakaki Lagoon from falling below the minimum level of R.L. 10.5 set by the National Water and Soil Conservation Authority (now deemed to be part of a Regional Plan under section 368 of the Resource Management Act 1991), and in addition insofar as possible maintain the "summer level" of R.L. 10.8 as verbally agreed to with tangata whenua, and to this end:
  - (a) install sufficient devices that the minimum level can actually be recorded; and,
  - (b) refill direct opening cuts in the bar as necessary.
9. That the Council recognise that under the Resource Management Act 1991, it exercises kawanatanga (government) delegated from the Crown, which under the principles of the Treaty of Waitangi should be exercised so as to accommodate tribal rights of tino rangatiratanga in managing resources and taonga, which means the right of tangata whenua to have a direct and meaningful decision-making role.
10. That the Council recognises that the land where the Council regularly makes bar opening excavations is owned by the Trustees of Whakaki Lagoon, including both the bed of Whakaki Lagoon in that area and the shingle bar down to the mean spring high tide level, and that the proposed site for restoration of openings at Paakaa is similarly owned by them and that the Council henceforward seek prior consent for entry and works in and affecting the Whakaki Lagoon.
11. That Regional Policies, Plans and Rules as appropriate be drafted so as to:
  - (a) actively encourage protection and restoration of wetland habitats and riparian vegetation, planting for erosion control, and minimisation of erosion from forestry plantation harvesting;
  - (b) actively support tangata whenua involvement in the control and management of natural resources in relation to Whakaki; and,
  - (c) actively support the restoration works selected as a result of the feasibility studies.
  - (d) assist the Trustees of Whakaki Lagoon to formulate a management plan for Whakaki Lagoon and consider making application to the Ministry for the Environment for a Resource Management Subsidy for that purpose.

12. That subject to the normal requirements of the Resource Management Act 1991, the maximum and minimum water levels for Whakaki Lagoon as set by the National Water and Soil Conservation Authority be included as part of any final Regional Coastal Plan and Regional Plan, and that the right to discharge water through the option chosen by tangata whenua be a permitted use.
13. That the Trustees of Whakaki Lagoon be given final decision making power over all openings of the Whakaki Lagoon, provided that the maximum level of R.L. 11.8 set by NWASCA is not exceeded for a significant period of time.
14. That the Trustees of Whakaki Lagoon be contacted in advance of any site visits, surveys or works in and around the lagoon for access consent, and that copies of any survey and monitoring results be provided to them.
15. That if the Rahui Paakaa option is chosen, a Whakaki Lagoon flood control monitoring and management advisory committee be convened and facilitated by the Council, to consist of representatives of the Trustees of Whakaki Lagoon, Whakaki 2N Incorporation, and other owners of low-lying lands affected by high levels in Whakaki Lagoon, with the task of:
  - (a) helping to design a monitoring programme that will satisfy affected landholders that any adverse effects from returning to the Rahui/Paakaa lagoon exit will be documented (including appropriate baseline data); and,
  - (b) advising on appropriate remedial action, if any, to be undertaken.
16. That should stakeholders or occupiers of low-lying lands around Whakaki Lagoon suffer any significant change of flooding effect, attributable solely to the implementation of a Rahui/Paakaa Option and an inability to keep water levels in Whakaki Lagoon at or below R.L. 11.8, that remedial actions be considered, including the options of an isolating stopbank protecting lands on the Iwitea side from Whakaki Lagoon flooding (and to be built as part of the Rahui/Paakaa scheme but maintained by adjacent landholders), or a reduced maximum Whakaki Lagoon level.

**To the Wairoa District Council**

17. That the Council recognise that under the Resource Management Act 1991, it exercises kawanatanga (government) delegated from the Crown, which under the principles of the Treaty of Waitangi should be exercised so as to accommodate tribal rights of tino rangatiratanga in managing resources and taonga, which means the right of tangata whenua to have a direct and meaningful decision-making role.
18. That District Plans, Policies and Rules as appropriate be drafted so as to actively encourage the protection and restoration of wetland habitats, the protection of riparian vegetation from grazing, tree planting for erosion control, and

minimisation of erosion from forestry plantation harvesting in the Whakaki Lagoon catchment, with particular attention to preventing major soil erosion from the harvest of the Pakurae pine plantation.

19. That the Council :

- (a) actively promote the Whakaki Lagoon flood control monitoring and management advisory committee to be convened and facilitated by the Regional Council; and,
- (b) actively promote the retiring from grazing of lagoon and feeder stream margins to assist the Trustees of Whakaki Lagoon in enhancing wildlife habitat.
- (c) in consultation with the Whakaki Lagoon Trustees, consider sponsoring a Conservation Corps programme which could assist the Trustees to restore Whakaki Lagoon.

**To the Department of Conservation (East Coast Conservancy) and the Eastern Region Fish and Game Council**

- 20. That advice and funding support be provided to assist the Trustees of Whakaki Lagoon in retiring portions of the margins and tributary streams of the lagoon, including assistance in formulating a management plan, fencing, planting, and land purchase.
- 21. That advice be given as requested to the Trustees of Whakaki Lagoon to assist them in controlling the harvest, and enhancing populations, of preferred species.

**To the Trustees of Whakaki Lagoon**

- 22. That the Trustees consider formulating a management plan for Whakaki Lagoon, and seek advice and funding from the Hawke's Bay Regional Council, Department of Conservation and Eastern Fish and Game Council as appropriate.
- 23. That as part of their management plan, the Trustees consider strengthening existing controls on eel fishing so as to give the eel population a better chance of recovery, with particular consideration of limiting sizes of catch and the use of fyke nets, ensuring openings when young glass eels return from the sea in the spring, and prohibiting the taking of the largest eels at migration time.
- 24. That as part of their management plan, the Trustees promote and participate in the retiring of lagoon and feeder stream margins from grazing and replanting with native species to enhance wildlife habitat in Whakaki Lagoon, and seek advice and funding from conservation authorities as required.

25. That the Trustees consider whether a Conservation Corps programme should be formulated for Whakaki Lagoon restoration work once a management plan has been developed.
26. That the Trustees consider the results of the independent feasibility study completed as a result of Recommendation 5, and indicate in writing to the Minister of Justice and the Hawke's Bay Regional Council their reaction to that additional information, and their preferred option and design features.
27. That the Trustees note a claim may need to be filed with the Waitangi Tribunal as a requirement by the Minister of Justice before the Crown enters into direct Treaty grievance negotiations.

**To the Whakaki Drainage Committee, the Whakaki 2N Trustees, the Trustees of Whakaki Lagoon, and other holders or occupiers of low-lying land around the Whakaki Lagoon**

28. That they participate in the Whakaki Lagoon flood control monitoring and management advisory committee to be convened and facilitated by the Hawkes Bay Regional Council in good faith and in the spirit of cooperation.



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*For further details and references see the Background Report* (available from the Office of the Parliamentary Commissioner for the Environment, PO Box 10-241, Wellington).

**GLOSSARY****Maori words**

<i>kaitiaki / kaitiakitanga</i>	guardian, steward / guardianship, stewardship
<i>kawanatanga</i>	governance, government (includes central and local)
<i>tangata whenua</i>	"people of the land": the Maori iwi or hapu which has mana whenua over a particular area
<i>taonga</i>	anything of significance to Maori culture and spirituality; includes intangibles as well as objects of a tangible nature
<i>tino rangatiratanga</i>	chiefly authority, chieftainship, full authority  <i>... refers not to a separate sovereignty but to tribal self management on lines similar to what we understand by local government ... denotes the mana not only to possess what one owns but ... to manage and control it in accordance with the preferences of the owner.</i> <sup>60</sup>

**Technical terms**

<i>eutrophication</i>	increase of nutrients in a water body
<i>habitat</i>	the place in which an animal or plant lives; particular features required for a healthy population to be sustained
<i>riparian</i>	along the edge of a waterway
<i>R.L.</i>	"reduced level": metres above mean high water sea level plus 10 (sea level set at a nominal 10.0 metres; therefore R.L. 11.8 means 1.8 metres above sea level)
<i>salinity</i>	degree of dissolved salts in water; (see Table 4.4 for salinity levels of fresh, brackish, or salt water)
<i>turbidity</i>	lack of clarity in water due to suspended particles

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<sup>60</sup> Waitangi Tribunal, 1991, Ngai Tahu Report, pp.230-33.