

REPORT TO NGA PUNA WAIHANGA ON THE REHABILITATION  
AND ESTABLISHMENT OF PINGAO IN THE EAST CAPE REGION

BACKGROUND

The Society contracted me from 8 May to 8 October 1985, to establish pingao (*Desmoschoenus spiralis*) in the East Cape region as part of their programme to actively promote the conservation of traditional Maori weaving materials. Of these materials pingao is probably the scarcest resource, having decreased in numbers and range in the last century largely as a result of habitat modification. For this reason, and because of the recent upsurge in traditional Maori crafts, it is timely that the conservation of pingao be encouraged.

My interest in pingao stems from research I have done into aspects of its ecology for an M.Sc thesis.

East Cape was chosen as a region for planting pingao because

- (a) very little pingao occurs there naturally
- (b) it supports a larger number of weavers and
- (c) I am familiar with the region.

LOGISTICS

For the first two months of the contract, wages were paid by the Department of Lands and Survey, Gisborne, under the Special Employment Scheme.

The Society provided me with a Yamaha XT350 motorbike as transport for the duration of fieldwork.

Expenses that arose during fieldwork, such as petrol were paid by Nga Puna Waihanga by way of a kitty system.

I arranged my own accommodation at Te Araroa and Potaka.

Contact was maintained with key members of the Society during fieldwork, viz. the National secretary, and the Chairman and Secretary of the Tai Rawhiti branch. A record was also kept of work-related activities and events. These were summarised in two progress reports (13 June and 2 September). (See Time Line, Appendix VI).

COASTAL SURVEY

All coastal sand country from Ohaiwa harbour (Whakatane) to the Waipau River mouth (Ruatatoria) was surveyed to determine the present natural distribution of pingao around East Cape. Waipiro, Tokomaru, Anaura and Tolaga Bays were also surveyed. At the same time dune areas were identified that would be suitable for planting pingao.

It was clear from the distribution survey (results in Appendix I) that pingao is rare in the East Cape region; the largest population occurs at Wharekahika (Hicks Bay), but their numbers are considered too low to provide either a sustainable weaving resource for the region, or transplants for other areas.

Records of past pingao distribution were forwarded by some elders of the region, (Appendix IB). Although these accounts are not comprehensive they indicate that within living memory pingao has decreased in numbers and range throughout the Cape.

Taharua REPORT TO NGA PUNA WAIHANGA ON THE REHABILITATION  
AND ESTABLISHMENT OF PINGAO IN THE EAST CAPE REGION

Cuttings in February 1987  
- thicker stems had better growth  
- more sand in potting mix for better drainage.  
- try separate dip for boost.  
all cuttings died.

Taharua

29.4.87  
cuttings twisted / cut from plant  
still shoots - roots sewing.  
leaves trimmed  
20/80/30 stem  
planted & showing  
planted / in showing  
of.

Sharnell Courtney M.Sc.,  
December 1985

Of the dunes surveyed, Oruaiti (Waihau Bay) and especially Parera (17 km east of Te Araroa, near East Cape) were identified as potential sites for pingao rehabilitation. The main criteria used in identifying these areas were,

- (a) the presence of at least some shifting sand
- (b) large size of potential transplant area
- (c) accessibility to weavers.

The Parera site comprises about 50 ha of unstable sand dunes and flats. The largest area of bare sand suitable for pingao establishment lies behind a coastal fringe of Kowhangatara (Spinifex), lupin and marram. It is made up of about 10 ha of low-lying sand flats close to the water table, and about 40 ha of higher sand flats and gently rolling dunes. (See Appendix III). Sand is being continually blown into the system from the coast in the north-west, and the dunes are slowly spreading outwards towards the south-east.

Hidden sites and other sites of archaeological interest are scattered over most of the Parera sand flats. Before planting could commence it was necessary to inform the Historic Places Trust of this project. They granted permission to plant on the dunes provided archaeological sites were left intact and planted around. Pamela Baines, an archaeologist for the Department of Lands and Survey, Gisborne, accompanied me to the dunes to learn of my intentions regarding transplanting.

The second site at Oruaiti beach comprises about 8 ha of low, semi-stable dunes and sand flats, sparsely covered with kowhangatara. A few areas of open sand suitable for pingao establishment occur within this area as a result of wind erosion.

#### SITE ACQUISITION

Owners of the two sites suitable for planting pingao were approached. The Department of Lands and Survey administers the Oruaiti beach dunes and welcomed the opportunity for dune binding plants, such as pingao, to be planted there, as part of their efforts in sand stabilisation.

The Parera dunes have multiple ownership and is administered as part of Parera Station. The managers are Arthur (Bully) Walker and Wera Ngata. Most of my dealings were with Mr. Walker. He was very interested in the pingao project and willingly apportioned some of the dune system to be used solely for pingao management. He understood that the project would firstly benefit the community by providing a long term pingao resource and secondly to help keep dune instability and erosion in check. He made a statement to the Waiapu County Council assuring them that he will treat the area apportioned for pingao cultivation as a 'reserve'.

#### PUBLIC RELATIONS

A hui in Te Araroa organised by Nga Puna Waihanga provided a good opportunity to make locals and other interested people aware of the pingao project. It also enabled me to make helpful contacts.

I erected a display to illustrate the project - what pingao looks like, its ecology, natural distribution, the method by which I proposed to transplant, and an example of a product woven in pingao.

I spoke at one of the evening gatherings about the project and received some useful feedback. I was also interviewed by reporters from the Gisborne Herald and the Opoitiki News about the project. The papers proved to be an important medium for reaching interested people further afield.

I also regularly visited people throughout the duration of fieldwork, mainly to establish who was willing to grow pingao as an experiment away from the coastal dune environment.

#### FENCING

Due to the pastoral use of land surrounding Parera dunes, the main transplant area, it was considered vital that a stock-proof fence be erected to ensure the establishment and long-term viability of pingao.

I approached Colin Rudland, a Waiapu County Councillor, to explore the possibility of a fencing grant from the Council. One thousand dollars was pledged on the assurance that no grazing be permitted within the enclosure. The Council also agreed that their PEP workers be made available for a limited period to erect the fence.

With the help of Bully Walker the type of fence was decided upon, and the amount of materials required was calculated and ordered through Wrightson NMA and a local fencing supplier.

It was decided that the best placing of the fence was to complete an enclosure by adding onto two existing farm fences (see Appendix III).

Materials were paid for personally in lieu of reimbursement. (See Appendix IV for breakdown of costs).

Upon the termination of my contract 2/3 of the fence had been completed with the help of local PEP workers for two weeks. The manager indicated that he would finish it, and remove cattle from the dunes until it was completed.

#### COLLECTING PROPAGULES

The short period of the contract ruled out the possibility of germinating pingao seed from the few local population. For seeds to germinate the beach transplant size would take about two years. The most viable option available was to collect vegetative propagules from large populations elsewhere in the North Island and transport them back to East Cape for transplanting.

Two collections were made: one from the dunes north of the Rangitikei River mouth, Wanganui, and the other from East Beach, north of Kaitiaki, Northland.

Mr. Henry Bennet gave me a lot of support in Wanganui by providing accommodation, useful contacts and daily transport to check out suitable sites from which to collect.

I was granted permission by Mr. Jim Davis, Ranger for Santoft State Forest to collect c. 800 propagules from large pingao populations scattered along the fore dunes within the State Forest, including the Ohakea bombing range. All of these populations had been over-planted in marram grass which is outcompeting and will eventually supplant pingao.

I was also given permission by the Kaitoke Prison Authorities for access to pingao on coastal land adjoining the prison grounds. I collected c. 500 propagules here.

To harvest I used pruning shears, cutting only side shoots and associated rhizomes. Never was a whole plant destroyed or more than one quarter of the shoots taken from each plant. Care was taken to prevent damage to any roots that were attached to the harvested plants. Shoots with long rhizomes were chosen in preference to any others as these provide stored water and nutrients for the growing points until the transplant is established.

Propagules were packed in large, clear, plastic bags and sealed. A car was hired to transport the propagules back to East Cape. It was unknown at this stage how long shoots could last between collecting and transplanting so it was considered important that they be transported as quickly as possible.

While in Wanganni I visited Mr. Bruce Creighton, Director of Parks and Recreation, to discuss the possibility of their using pingao instead of marram as a dune stabilizer for coastal reserves. He was very interested and proposed to follow it up.

I travelled to Northland by motorbike and used the vehicle and help of friends in Kaikohe to collect c. 200 propagules from East Beach and transport them to Kaitiaki. The plants travelled back to Te Araroa by N.Z. Road Services. This proved to be a more economically viable alternative than hiring a car.

TRANSPLANTING

Propagules were removed from their plastic bags at Parera dunes and trenched in a large, water-filled, shallow sand pit that had been dug below water-table. This kept the plants fresh and growing for at least two weeks until transplanting was completed. The Wanganni transplants were planted between 19 - 26 August, and the kaitiaki transplants were planted between 20 - 30 September.

Most were planted out over c. 20 ha of dunes at Parera on c. 5 ha of wet sand flats, and 15 ha of low, rolling dunes (See map, Appendix III). They were planted in evenly spaced rows at c. 7m (10-step) intervals in the following pattern, (Figure 1).

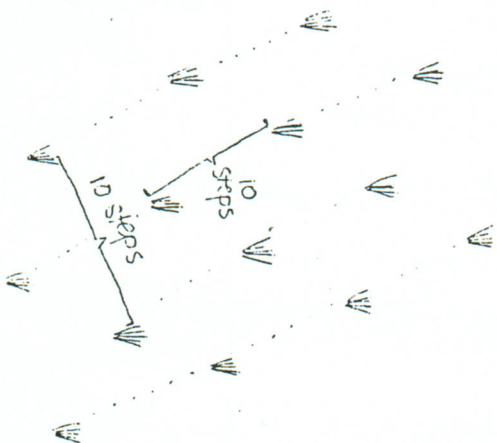


Fig 1. Spacing of transplants

For each plant a hole was dug, usually between 0.5 and 1.0 m deep, large enough to incorporate all but the top 10 - 15 cm of the leaves. It was important that the growing point of each shoot was buried well below the sand surface and within the moist sand substrate. This prevents drying out while the roots and new leaves are initiating, (Figure 2).

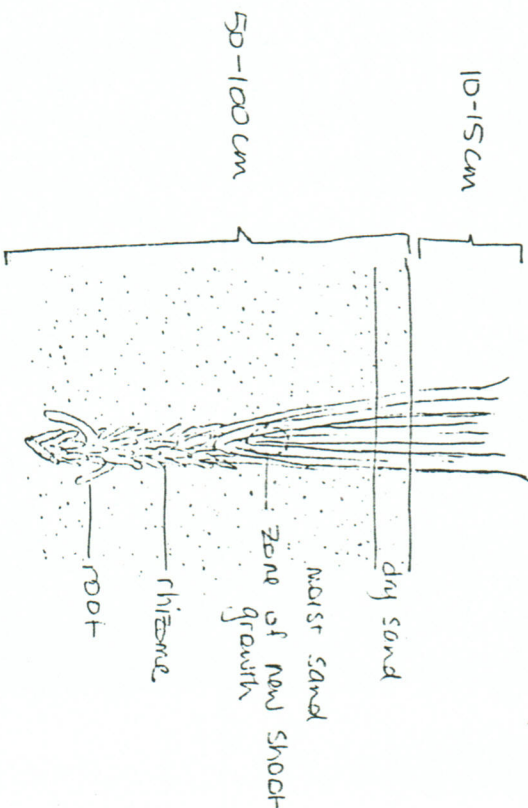


Fig 2 Depth of transplant.

The hole was repacked firmly so the top layer of fill was flush with the sand surface. This prevented wind stripping away any sand around the plants.

Young lateral shoots (c. 500 in total) were removed from the parent shoot and planted on the wet sand flats in a similar manner, but at smaller intervals.

Most of the transplanting was done by myself, although assistance was given by the high school students of Te Waha o Rerekohu area school, Te Araroa, for an afternoon, and the people of Potaka Partnership assisted for a total of eight person-days. The efforts of all the people who helped in the planting were greatly appreciated.

About three hundred propagules were kept aside for planting at other locations with the help of Ngapine Allen some were given to schools, marae and a total of twenty individuals to plant out in their gardens as an experiment to see whether pingao could be grown away from a coastal environment. Localities where I planted pingao, and people who have received propagules for planting are listed in Appendix V.

PROBLEMS ENCOUNTERED

- inability to find permanent accommodation at Te Araroa, the most convenient base for most of the project. This meant much travelling from my lodgings at Potaka, (I averaged c.100 km/day).

- frequent motorbike repairs
- getting finances and worker help to complete the fence
- arranging transport of propagules from collection sites to East Cape.
- uprooting of initial transplants by cattle. About one hundred plants were lost this way.
- pruning back of new growth by hares. Establishing plants will die if pruning is regular.
- Strong winds burying/exposing plants before they are established.

RECOMMENDATIONS

- that follow up work to evaluate the success of the project shall be undertaken at the end of the growing season.
- that further funding is sought to defray project costs i.e. Royal Forest and Bird Protection Society of N.Z. grant, Mobil Environmental grant, Queen Elizabeth II Arts Council grant via Council for Maori and South Pacific Arts.
- that research be encouraged into rehabilitation and establishment of other plant species associated with traditional weaving such as kiekie harakeke, wharariki and natural mordant species (hinanu, mako, tahero, karangu).

Shannel Courtney, M.Sc.  
December 1985

APPENDIX I

A. Localities of Pingao occurring naturally in the East Cape Region, May - July 1985.

1. Ohiva Harbour Sandspit. A 5m x 2m dump and several scattered tufts on the western side of the harbour outlet.
2. Waioeka River mouth. Two small slumps near small sandspit on eastern side of river mouth. One on eroding dune.
3. Whangaparaoa Beach. Two plants found. One 0.5 km south of Whangaparaoa river mouth on coarse sand and pebbles; one on sand flats on northern side of mouth.
4. Wharekahika (Hicks Bay). Small, scattered populations on dunes at both ends of the beach, and over sand flats between Nukutaharua Stream and Wharekahika River. Over 1000 shoot in total. The largest population in the region.
5. Punaruku Beach, (5km northwest of Te Araroa). One plant only, on narrow sand flat near high tide.

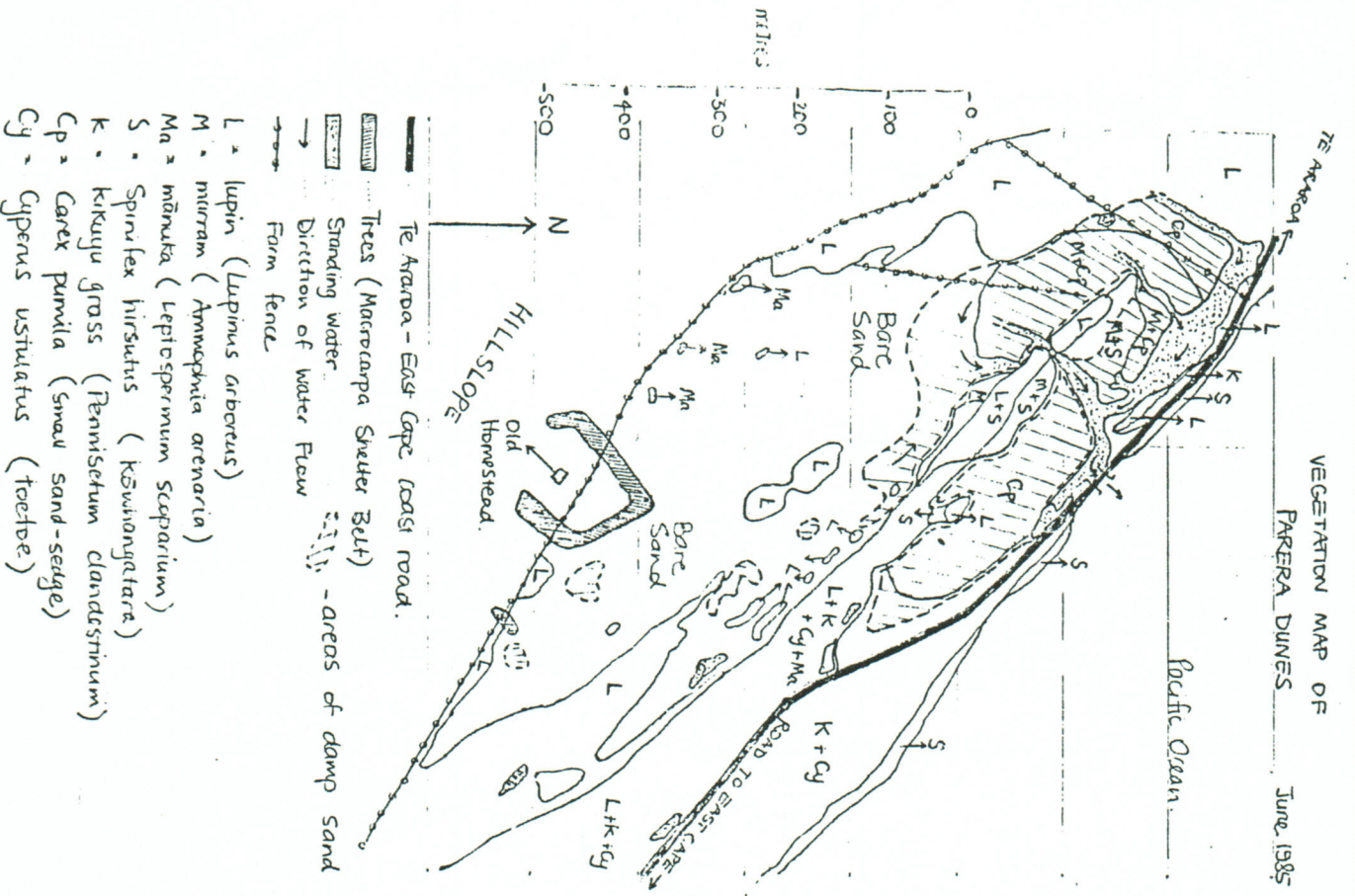
B. Past distribution records of Pingao in the East Cape region.

1. Scattered along the northern part of Whangaparaoa Beach (Source, Mere Ruwhui)
2. Common on dunes and sandflats at Wharekahika (Source, Pani Tihere)
3. Common along the northwest end of Te Araroa beach near Puananiku (Source, Mihi Hooper)
4. Common along Hautai dunes near Oritua River, 8 km east of Te Araroa (Source Kohi Potae).
5. Common on dunes and sandflats at Parera, 16 km east of Te Araroa (Source, Arthur Walker).

It is not remembered from Tokomaru and Tolaga Bays

Appendix II

VEGETATION MAP OF  
PAREPARE DUNES June 1985

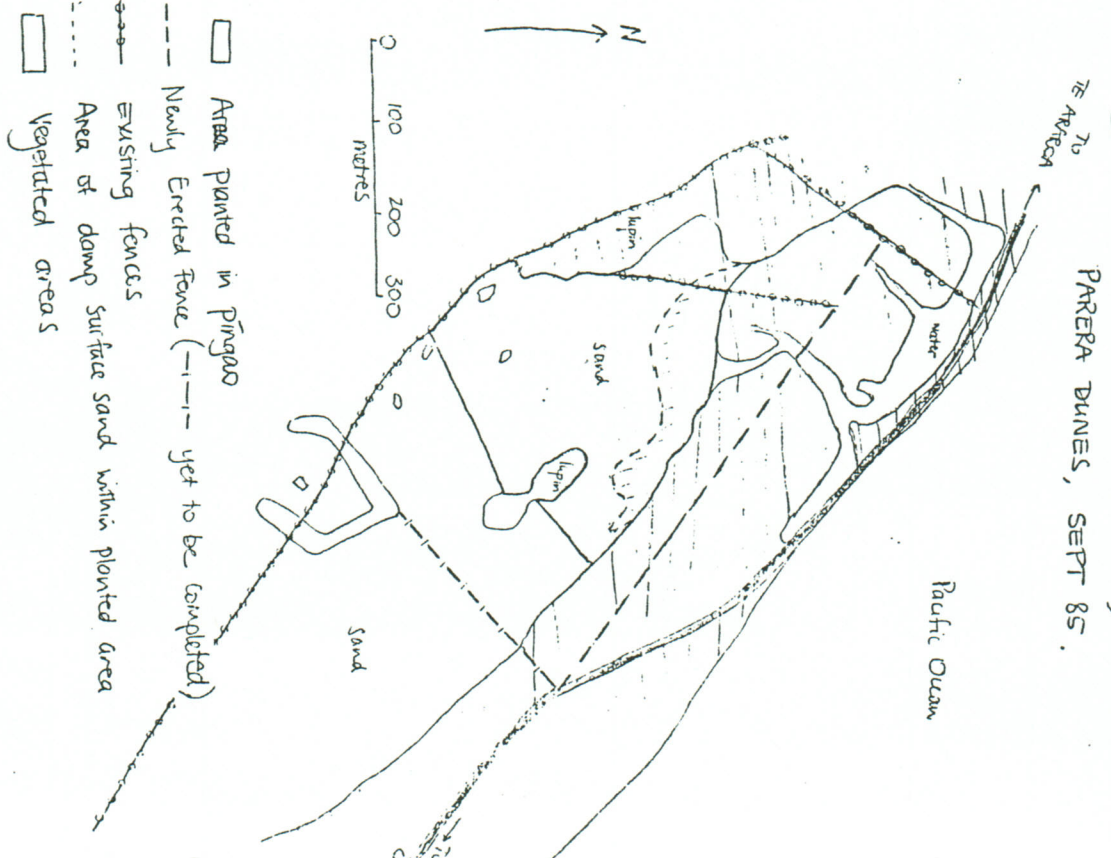


- L = lupin (*Lupinus arboreus*)
- M = mirram (*Ammeophila arenaria*)
- Ma = mānuka (*Leptospermum scoparium*)
- S = *Spirnifex hirsutus* (*Kōwhiriātara*)
- K = kikuyu grass (*Pennisetum clandestinum*)
- Cp = *Carex pumila* (small sand-sedge)
- Cy = *Cyperus ustulatus* (toetoe)

- ▬ Te Anaua - East Cape road.
- ▬ Trees (Mārcaraipa Shelter Belt)
- ▬ Standing water.
- Direction of water flow
- ▬ Farm fence
- ▬ - areas of damp sand

Appendix III

MAP OF AREA PLANTED IN PINGAO AND  
POSITION OF NEW FENCE,  
PAREPARE DUNES, SEPT 85.



- ▬ Area planted in pingao
- - - Newly Erected Fence (- - - yet to be completed)
- ▬ Existing fences
- - - Area of damp surface sand within planted area
- ▬ Vegetated areas

APPENDIX IV Fencing Costs (60 chains)

Wire coils, high tension 2.5 mm x 11	} Wrightson N.M.A.	591.38
1 box post staples (barbed)		
1 box baton staples (barbed)		
Coils and Staples Freight		31.09
232 x No. 3 rounds @ \$2.60	} Ron Hedley P.O. Box 79, Ruatoria	603.20
33 x No. 2 rounds @ \$3.66		120.78
800 x 1st grade batons @ \$0.60		480.00
3 x 7 ft strainers @ \$11.75		35.25
Posts and batons freight - East Coast Freighters		180.00
		<u>\$2041.70</u>

APPENDIX V

Places where pingao has been planted

Number	c 2000
Parera Dunes	60
Oriaiti Dunes	25
Hinetamatea Marae, Anaaura Bay	25
Tolaga Bay High School	25
Tokomaru Bay	24
Hauti Marae	15
Horowera Dunes	10
Tokomaru Bay School	5
Tumanaki Flats (old people's home), Tokomaru Bay	4

People who have received pingao for planting

Number	People who have received pingao for planting
10	Ngapine Allen (Te Puia Springs)
2	Dawn Brooking (Taurangakautuku Valley)
10	Grant Dargie (Tokomaru Bay)
20	Pani Ellison (Waipiro Bay)
6	Averil Herbert (Rotorua)
3	Janet Howell (Te Araroa)
6	Mihi Hooper (Te Araroa)
5	Nunu Kingi (Tokomaru Bay)
11	Lena Nukunuku (Tikitiki)
3	Sheridan Palmer (Opotiki)
1	Hime and Bob Putaranui (Tolaga Bay)
4	Honor Richard (Rangitukia)
1	Miriam Rudland (Kopuapounamu Valley)
3	Mere Ruwhiu (Whangaparaoa)
2	Roy Sorenson (Potaka)
9	Wayne (Parks & Recreation Officer, Whakatane)
1	Madeleine Tongohau (inland from Tolaga Bay)
2	Ellen Walker (Te Araroa)
2	Kura Walker
12	Paul Weka