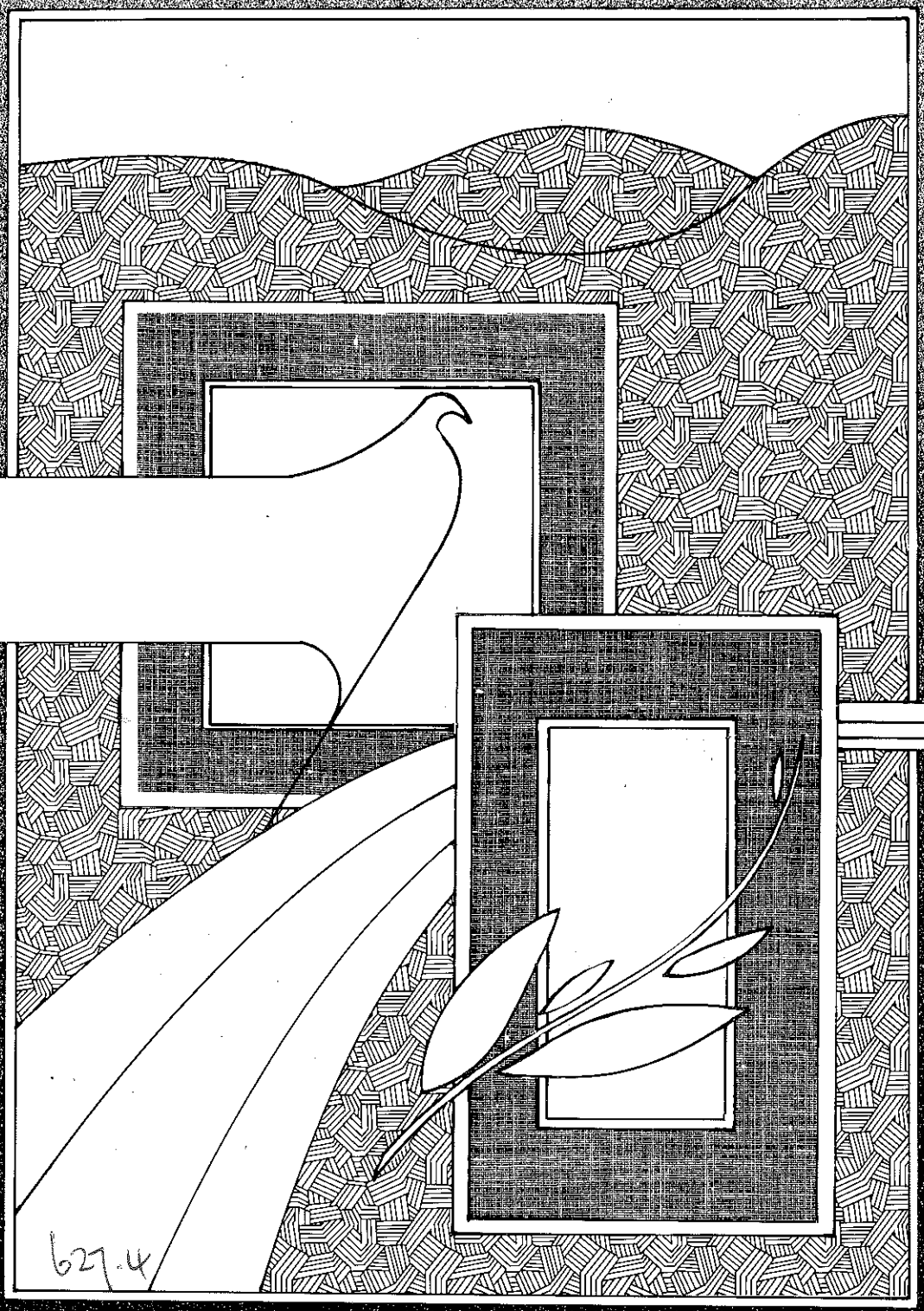
Auckland Conservancy

DEDICATED AREAS REPORT Number 6



Te Tipi Ecological Area

NEW ZEALAND FOREST SERVICE

ODC no. 627.4

$2.50

TE TIPI ECOLOGICAL AREA

NZ FOREST SERVICE
AUCKLAND CONSERVANCY
CPO Box 39
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(This is an unpublished internal report)

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January 1985

TE TIPI ECOLOGICAL AREA

Contents | Page No.

Location (Figure 1)

The proposed Te Tipi Ecological Area occurs in the middle of the Coromandel Ranges centred on a high altitude plateau region of indigenous forest and scrublands. It covers 1620 ha and is situated approximately 16.5 km north-east of Thames. Included in the reserve are the summit plateau and escarpments of Table Mountain, an outstanding geological feature. The midpoint of the reserve is at map ref. NZMS 260 T12 475605.

The proposed Ecological Area lies half in the Thames and half in the Tairua Ecological District (Simpson 1982, BRC 1983) and is situated in the Kauaeranga Block of the Coromandel State Forest Park (NZFS 1978). The reserve is bounded on all sides by the Forest Park. The most recent aerial photographs are NZAM survey No. 8163, run 0, photos 8 and 9 and run P, photos 6 and 7; flown on 10th January 1983.

Access (Figure 2)

Walking access into the proposed Ecological Area is restricted to a track system along its south-eastern boundary. The Waiwawa hut and tracks to it are being left to degrade and in the future this access will be more difficult. Tracks across Table Mountain (track 2, NZFS 1983a) and to Moss Creek Hut (track 18, NZFS 1983a) leave from the end of Kauaeranga Valley Road. A further track leads from the Pinnacles Hut to Moss Creek Hut (track 14, NZFS 1983a) crossing through the reserve.

The majority of the Ecological Area is difficult to visit. Not only is it surrounded by a 'No Development' zone comprised of the valleys of the Waiwawa River and the Rangihau Stream, but the reserve itself is notable for its ruggedness. The thick groundcover, scrub and swampy conditions which cover the Te Tipi plateau area make this region one of the most inaccessible and consequently one of the least visited anywhere on the Coromandel Peninsula.

History of Reservation

The initial proposal for Te Tipi was made by J.L. Nicholls (F.R.I., Rotorua) prior to 1974 (no exact date is recorded). The first plan was to create a 283 ha reserve covering the centre of the Te Tipi plateau. On reconsideration, the proposal was extended to include the entire altitudinal sequence available from the Waiwawa River in the west to the Rangihau Stream in the east. The S.C.C. (Scientific Co-ordinating Committee*) approved this proposal but further extended it to include Table Mountain. The latter addition was 'to reserve the unique unmodified forest types of the plateau top and the geological structure itself' (S.C.C. 1979). The Te Tipi Ecological Area proposal has been approved in principle by the Minister of Forests (14th March 1980) but awaits final gazettal.

* now retermed the State Forests Scientific Reserves Advisory Committee

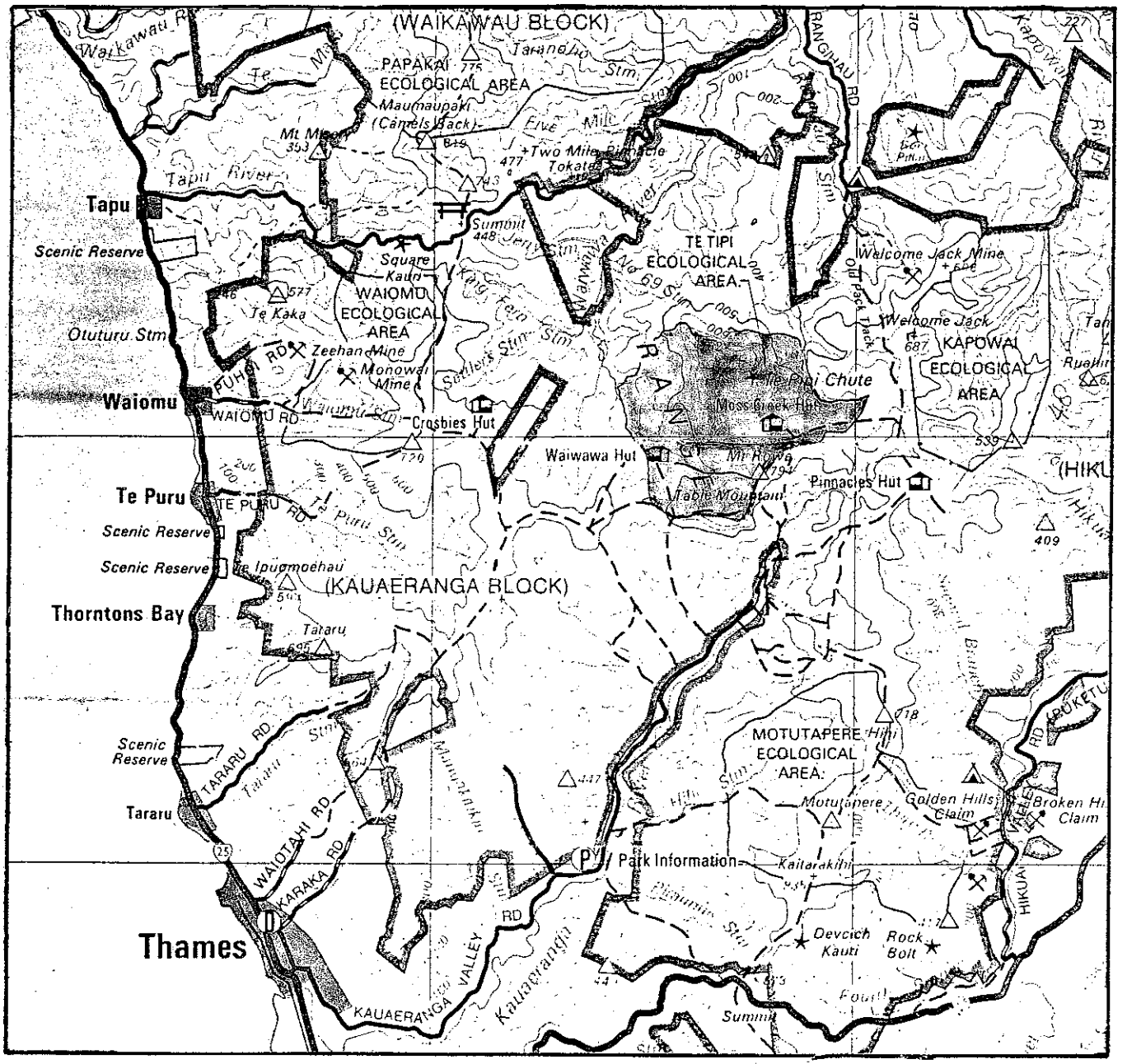
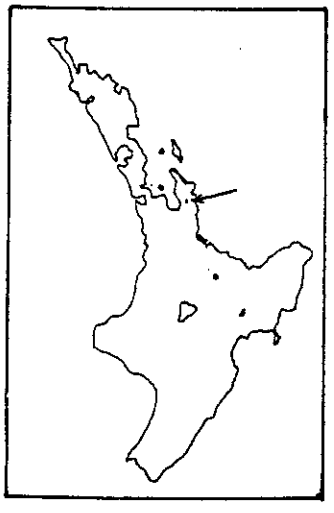


Fig. 1 : Location Diagram : Te Tipi Ecological Area

(based on NZMS 274/1 Coromandel State Forest Park, 2nd Edition 1983, NZFS, Government Printer)

Ecological Area

State Forest Park Boundary



Rationale and Objectives of Designation

Ecological Areas are set aside to :

1. understand and explain natural processes;

2. maintain bench-marks for measuring change on initially comparable developed land;

3. maintain genetic diversity of plants and animals; and

4. preserve rare plants, native fauna, archaeological or other historic sites, particular topographical features and geological and soil sites (NZFS 1977).

The S.C.C. (1980) have listed the qualities desirable in a reserve. The proposed Te Tipi Ecological Area has many of these.

It represents a range of land forms of the region and covers over 1000 ha, the minimum recommended size. It has a reasonably compact shape, is unroaded and has boundaries mostly defined by natural features. The reserve includes parts of several small catchments, but its boundaries divide the major catchments of the Rangihau Stream and Waiwawa River. This seems contrary to the concept of ecological areas covering complete catchments as natural units. However the majority of the reserve covers the high-altitude plateau area which is in itself a natural unit.

The purpose of designation, based on the earlier 283 ha proposal is :

> 'to reserve a representative example of the main tract of the unique high altitude kauri forest of the Coromandel Range, selectively logged many years ago but containing dense stands of regenerating kauri'
> (NZFS 1978)

Upon gazettal the reserve will attain an IUCN* classification of IV (Nature Conservation Reserve). The IUCN management objectives of this type of reserve allow the application of manipulative management techniques to assure the survival of certain species of plants and animals. Scientific research, environmental monitoring and educational use are primary activities associated with this category (IUCN 1978).

Topography

The proposed Ecological Area covers an altitudinal range from 212 m (in the Waiwawa Valley) to 832 m (Table Mountain). The majority of the reserve covers the Te Tipi plateau between 550 m and 760 m with slopes of 4° - 20° and surrounded by many bluffs. To the west, the reserve covers steep (26° to greater than 35°) slopes, leading down to the Waiwawa River. To the east, the plateau falls to moderately steep hill country (20° - 26° slopes) in the catchment of the Rangihau Stream. Bluffs, rock outcrops and surface boulders are prominent in this region. A 60 m waterfall is a feature of the Te Tipi Stream. (Water and Soil Division, MOWD, 1975)

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*IUCN = International Union for the Conservation of Nature and Natural Resources.

Climate

Discussions of climate on the Coromandel are given in Burns (1983) and Maunder (1974).

The closest climate recording station to Te Tipi is at Thames. However it occurs at sea level and local exposure and altitude will have an over-riding effect on the true climate experienced in the reserve. The Te Tipi plateau and Table Mountain are notable for frequent cloud and rain. Thames has recorded a mean annual rainfall of 1278 mm, a mean daily minimum temperature of 10.6°C and a mean daily maximum of 19.0°C. (NZMS 1973).

Geology

The Te Tipi region is interesting geologically as it displays a number of rock types characteristic of several volcanic periods of the Coromandel's history.

> 'The Table Mountain area is a region of steeply dissected andesitic, rhyolitic and associated sedimentary deposits belonging to three groups. Andesitic lavas, rudites and finer sediments of the Coromandel Group were erupted during the lowermost Pliocene. They are conformably overlain by rhyolitic sediments, ignimbrites, and minor lavas of the lower to mid-Pliocene Whitianga Group, mapped as Wainora Formation, undifferentiated Coroglen Subgroups, and Minden Rhyolite Subgroup. Wainora Formation consists of basal volcorudites and fossiliferous, carbonaceous, lacustrine, epivolcaniclastic sediments. These are conformably overlain by thicker and more extensive pyroclastic sediments and rare ignimbrites of the undifferentiated Coroglen Subgroup. Four domes of Minden Rhyolite were formed towards the end of this pyroclastic phase, hydrothermal alteration was closely associated with their eruption. The last volcanic activity produced the Omahia Andesite intrusion and minor extrusion of flows (mid-Pliocene and younger).'
>
> (Hayward 1974a)

To the west, in the Waiwawa Valley, the underlying rocks are andesitic (Beeson's Island Volcanics). These are overlain in the east by rhyolitic ignimbrite sheets in the Rangihau Stream catchment. The high altitude plateau and Table Mountain itself are formed of volcanic lavas, andesite flows, dikes and sills. The bluffs so characteristic of this proposed reserve define the boundaries of most of these differences (Water and Soil Division, MOWD 1975, N.Z. Geological Survey 1967; Department of Lands and Survey 1975).

Other geological references are Hayward (1971, 1974b). Of interest is the discovery of fossil macroflora in the Moores Stream area of the Waiwawa River Valley. Here an area of fine epiclastic lake sediments occurs (Hayward 1974b).

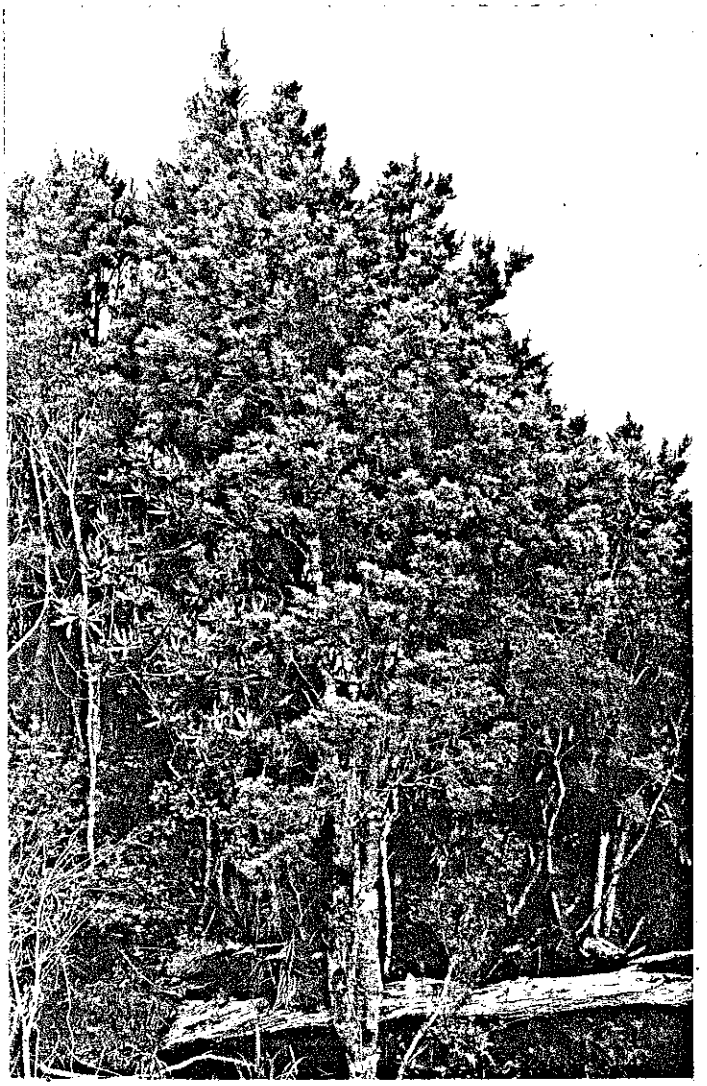


Photo 1:(right): Yellow silver pine in the Te Tipi Ecological Area (photo by P. de Jager)

Photo 2: (left): Adult foliage of yellow silver pine (photo by P. de Jager)

Pedology and Erosion

A number of soil types are represented in the proposed reserve. The extent of these types is shown on overlay 3, figure 2 (based on Water and Soil Division, MOWD, 1975). To the west are Aroha and Te Kie steepland soils. The former are sandy or clay loam skeletal soils from andesitic rock of medium to low natural fertility. The latter are stony clay loams from analite basalt and andesite of medium to high fertility. Surrounding the central plateau area to the east and west and covering the most precipitous slopes are Tangatara steepland soils. These are related to yellow brown earths, are formed from weathered and fresh rhyolite and ignimbrite and are of low nutrient status. They are liable to severe sheet and slip erosion. The central plateau and Table Mountain are covered in Rangiuru clay and hill soils, a strongly leached brown granular clay derived from andesite of low to very low natural fertility. Finally in the northeastern corner, soils are Pukenamu hill soils, yellow brown earths formed from weathered rhyolite and ignimbrite. These are also of low nutrient status (Eyre 1977, Department of Lands and Survey 1975).

Erosion is confined to the steepest slopes surrounding the plateau area and Table Mountain. Bare rock is exposed on almost vertical bluffs in many places. I encountered few slips within the proposed reserve. However, the Land Resource Inventory Worksheet records severe (21% - 40% area affected) debris avalanche type erosion on the precipitous slopes to the west and moderate (11% - 20% area affected) on the steep slopes to the east of the plateau and around Table Mountain (Water and Soil Division, MOWD, 1975).

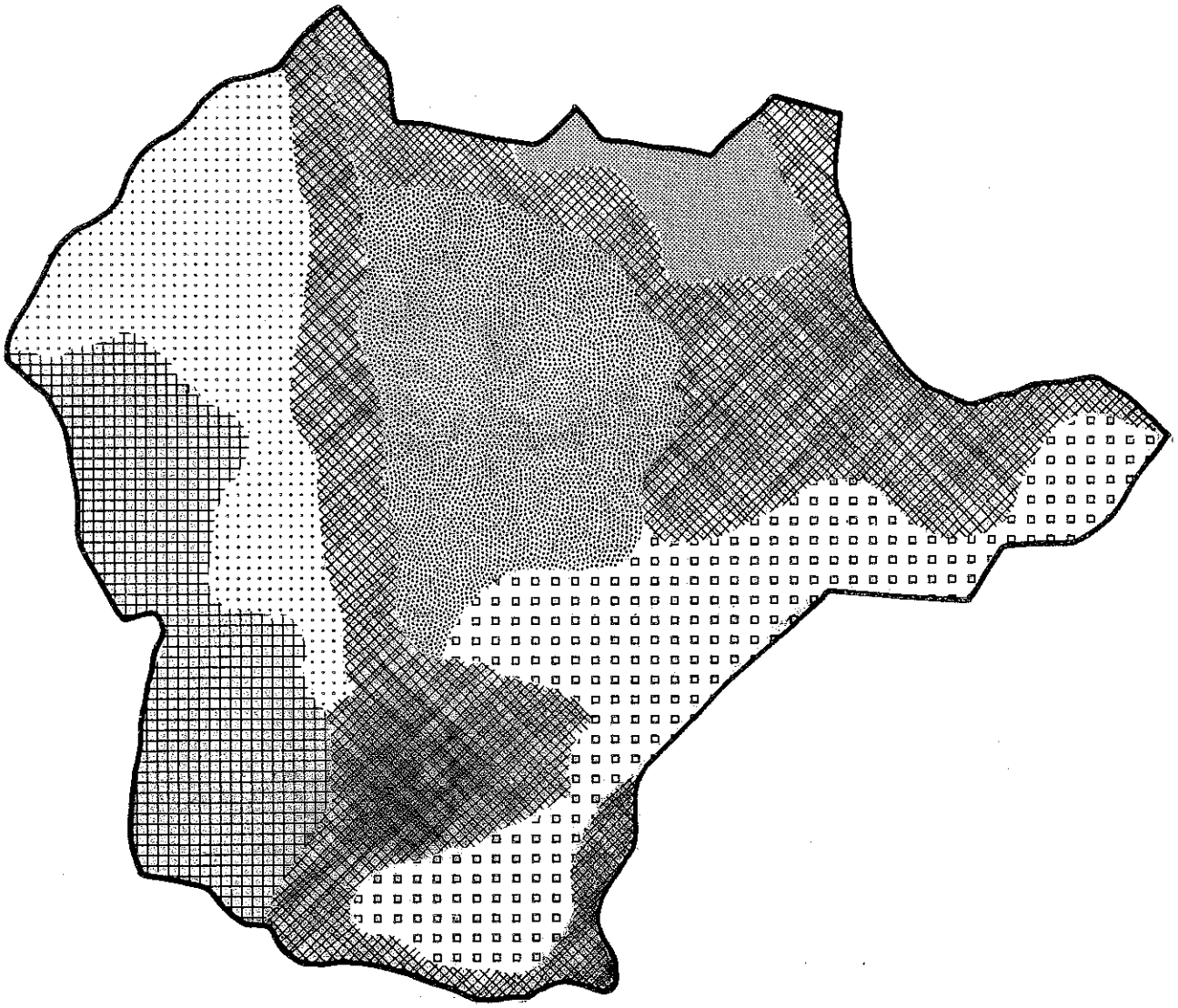
Vegetation

This description is based on eleven Forest Survey Tally Sheets (NZFS 1948), nine Ecological Forest Survey Tally Sheets (NZFS 1966) and five days field work (24th - 25th March, 12th April 1983 and 18th, 19th July 1984). Overlay 2 of figure 2 shows the location of the various field descriptions made.

The method used to describe vegetation in the recent field work is a modified recce-type description in which the vegetation was recorded in a number of tiers. The five tiers used are canopy emergents, canopy, subcanopy (from beneath canopy height down to 2 m), shrub (2 m down to 50 cm) and groundcover (50 cm to ground level). Site descriptions are grouped into types based as closely as possible on Nicholls' (1976) classification. Further discussion of this method is given in Burns (1983).

I have classified the vegetation into three general types :

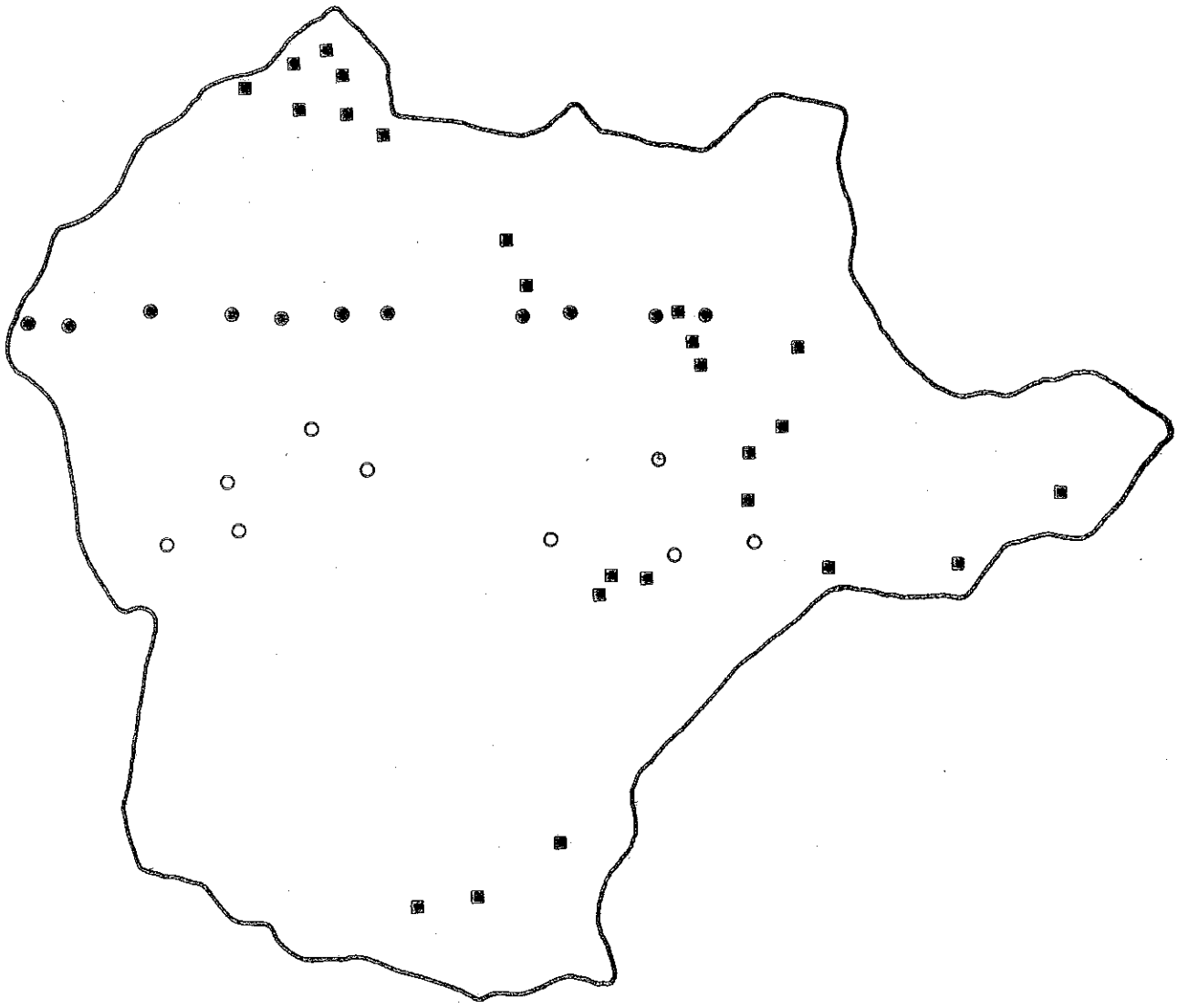
1. unmodified high altitude podocarp-hardwood forest (Nicholls 1976, type B12);
2. modified high altitude kauri-podocarp-hardwood forest; and
3. low-mid altitude podocarp-hardwood forest with rare kauri (Nicholls 1976, type B5).



Overlay 3 : Soil Types

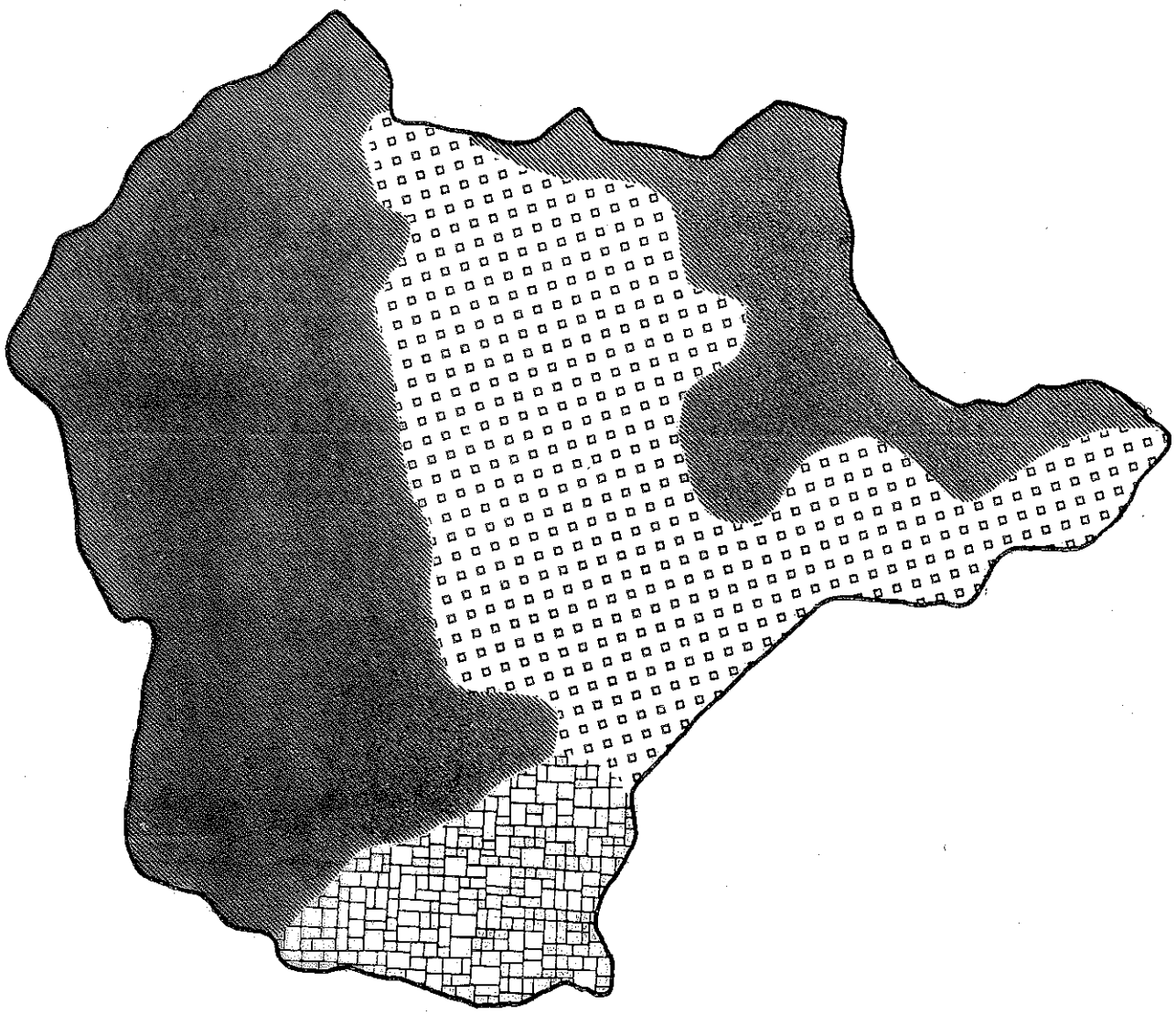
- Pukenamu hill soils
- Rangiuru hill soils
- Rangiuru clay
- Tangatara steepland soils
- Aroha steepland soils
- Te Kie steepland soils

(Based on N.Z Land Resource Inventory Worksheets N44 and N49, Water and Soil Division, M.O.W.D., 1975)



Overlay 2 : Location of Vegetation Descriptions

- ● NZFS 1948
- ○ NZFS 1966
- ■ Burns 1983-84



Overlay 1 : Forest Types

- unmodified high-altitude podocarp-hardwood forest
- modified high-altitude kauri-podocarp-hardwood forest
- low-mid altitude podocarp-hardwood forest with rare kauri

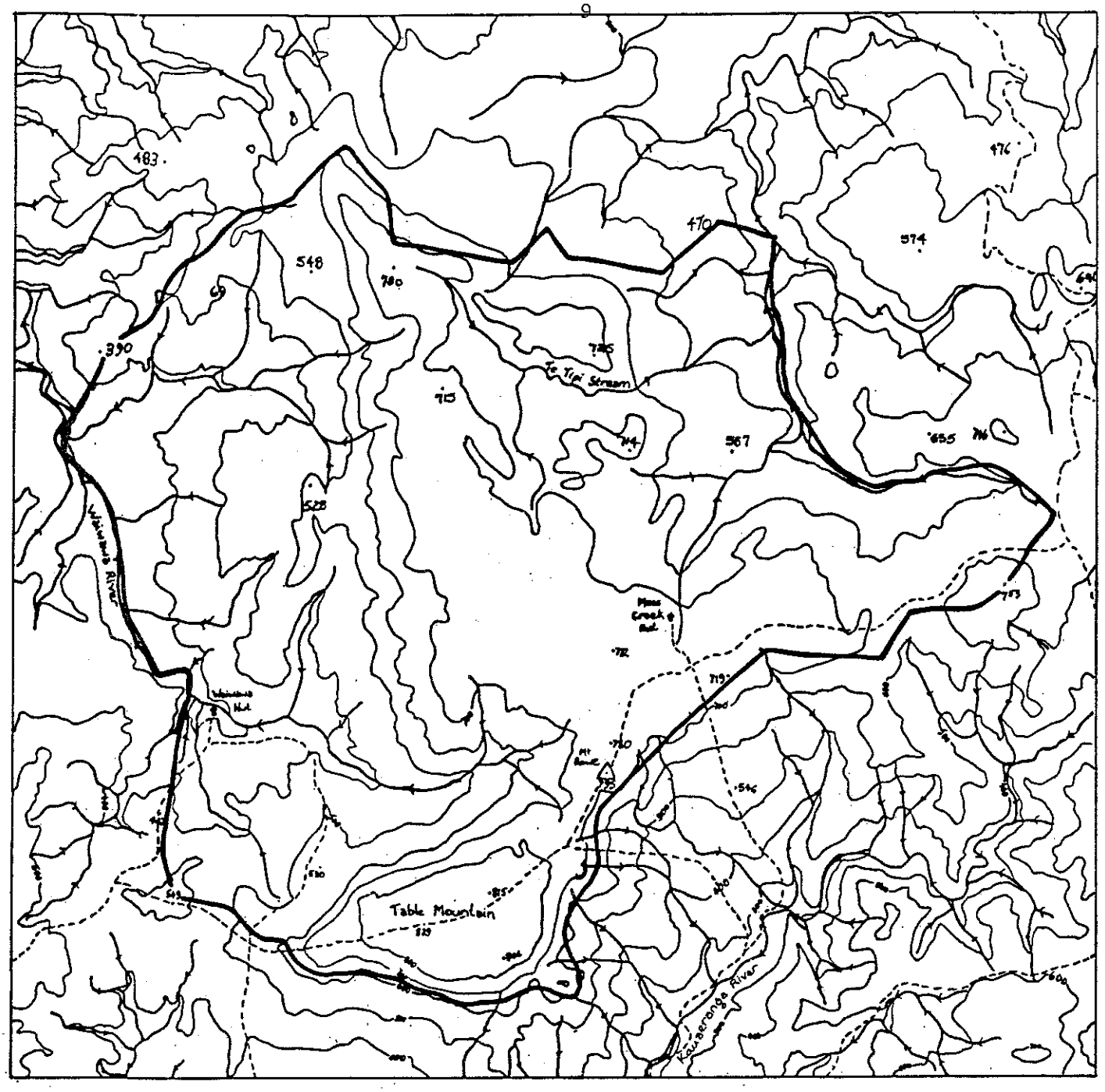


Figure 2 : TE TIPI ECOLOGICAL AREA

LEGEND:

100 m interval contours

Eco. Area Boundary

track

drainage

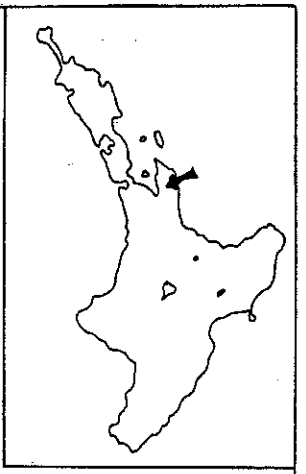
trig station

hut

G M

G = grid north

M = magnetic north



SCALE:

0 500m 1 km

The extent of these types is shown on overlay 1 of figure 2. A detailed species list is given as appendix 1 giving both scientific and common names for plants present.

1. The first type is an unmodified high altitude podocarp-hardwood forest which clothes the summit of Table Mountain (generalised stand structure, table I). The forest is comprised of an 8 - 10 m even canopy of abundant yellow silver pine and tawari with occasional southern rata and rare kauri. The appearance of the vegetation is one of chaos. Obviously the forest is subject to high winds as most trunks are twisted and warped at different angles and many trunks lie on the ground. The groundcover is dense with *Gahnia pauciflora* and *Astelia* species. The ground surface is always wet and soft making travel across Table Mountain much like walking in a swamp.

2. On the Te Tipi plateau area, between 600 and 800 m a.s.l., one finds the second forest type, a modified high altitude kauri-podocarp-hardwood forest (generalised stand structure, table II). Due to logging and fire, this type has a very variable canopy height, though the composition remains similar throughout. Emergent at 20 - 30 m are large rimu and less frequent kauri. Many old dead trunks and spars stand out white and stark against the rest of the vegetation. Other emergents are toatoa and small groups of yellow silver pine. The canopy and subcanopy are very variable with many gaps and open areas. Tawari is abundant with frequent tawheowheo, towai, *Pseudopanax colensoi* and *P. discolor*. Other common canopy and subcanopy species are yellow silver pine, broadleaf, hinau, southern rata, toatoa and kauri seedlings and saplings. The groundcover is dense to the point of being almost impenetrable. *Gahnia pauciflora, G. xanthocarpa, Astelia trinervia* and kiekie combine to form this tier.

3. The third forest type is a low-mid (212 m - 600 m a.s.l.) altitude kauri-podocarp-hardwood forest. This type covers the slopes leading up to the central plateau in the catchments of the Waiwawa River and the Rangihau Stream. Common emergents are large northern rata and rimu with occasional kauri, Hall's totara and miro. The canopy is comprised mainly of towai and tawa but with occasional rewarewa, hinau, tawari, miro and mahoe. Climbers, particularly supplejack, often form tangled masses within this forest type.

The proposed Te Tipi Ecological Area contains a number of species of note. *Loxoma cunninghamii* is a fern included in the Red Data Book of New Zealand and recorded as vulnerable (Williams and Given 1981). The following species present are listed as rare in the Coromandel : *Archeria racemosa; Dacrydium colensoi, Metrosideros albiflora; Pittosporum huttonianum, Dracophyllum patens, Loxoma cunninghamii* and *Coprosma dodonaeifolia*. (Appendix 13, NZFS 1978)

Records exist of the presence of two further species rare in the Coromandel (NZFS 1948); *Dacrydium kirkii* and *Elaeocarpus hookerianus*. These were not found during the 1983-84 fieldwork. Braggins et al (1983) list species with distributional significance in the Coromandels. The proposed reserve contains fifteen of these plant species including a species of tussock reaching the northern limits of its distribution; *Chionochloa conspicua* var. *cunninghamii*.

TABLE I : GENERALISED STAND STRUCTURE FOR UNMODIFIED HIGH ALTITUDE PODOCARP-HARDWOOD FOREST (TABLE MOUNTAIN)

	← INCREASING DOMINANCE →			
	ABUNDANT	FREQUENT	OCCASIONAL	RARE
EMERGENT				
CANOPY (8-10 m)	yellow silver pine tawari		southern rata	kauri
SUBCANOPY (2-8 m)		toatoa towai tawheowheo *Pseudopanax discolor*	*Pseudopanax colensoi* hinau *Dracophyllum pyramidale* tawari Sthn rata, korokia	
SHRUB (0.5-2 m)		*Pseudopanax colensoi* tawheowheo *Coprosma dodonaeifolia* karapapa	towai *Pseudopanax discolor*	
GROUNDCOVER (0-0.5 m)	*Gahnia pauciflora* *Astelia trinervia* mosses		*Astelia fragrans* *A. solandri*	
EPIPHYTES AND CLIMBERS	mosses	*Hymenophyllum multifidum*		

DISTRIBUTION: An even canopy covering the flat summit of Table Mountain at approximately 820 m a.s.l. (Nicholls B12)

NOTES:

TABLE II : GENERALISED STAND STRUCTURE FOR MODIFIED HIGH ALTITUDE KAURI-PODOCARP-HARDWOOD FOREST

	← INCREASING DOMINANCE →			
	ABUNDANT	FREQUENT	OCCASIONAL	RARE
EMERGENT * (20-30 m)		rimu	kauri toatoa yellow silver pine	
CANOPY ** variable heights	tawari	*Pseudopanax colensoi* *P. discolor* tawheowheo	yellow silver pine broadleaf hinau	
SUBCANOPY		towai	southern rata toatoa kauri	
SHRUB (0.5-2 m)		tawheowheo korokia towai *Pseudopanax colensoi* *P. discolor*	broadleaf Kirk's daisy mingimingi karapapa *Coprosma dodonaeifolia* tawari	
GROUNDCOVER (0-0.5 m)		*Gahnia pauciflora* *G. xanthocarpa* *Astelia trinervia* *Blechnum capense*		
EPIPHYTES AND CLIMBERS		mosses	*Metrosideros albiflora* *M. diffusa*	

DISTRIBUTION: Covers main plateau area at altitudes between approx. 600 m - 800 m a.s.l.

NOTES:

* large rimu and kauri stand 20 - 30 m above the rest of the vegetation. Also emergent are dead kauri spars.

** canopy is very variable in height - up to 16 m

TABLE III : GENERALISED STAND STRUCTURE FOR LOW-MID ALTITUDE KAURI-PODOCARP-HARDWOOD FOREST

	← INCREASING DOMINANCE →			
	ABUNDANT	FREQUENT	OCCASIONAL	RARE
EMERGENT (24-30 m)		rimu northern rata	kauri Hall's totara miro	pukatea kahikatea
CANOPY (10-20 cm)	towai tawa		rewarewa hinau tawari miro mahoe	
SUBCANOPY (2-10 m)	towai	mahoe ponga tawari pigeonwood supplejack	*Cyathea smithii* tawa hinau fivefinger *Pseudopanax discolor* kohekohe, nikau	
SHRUB (0.5-2 m)		*Cyathea smithii* ponga heketara fivefinger karapapa	wheki mahoe horopito rangiora	
GROUNDCOVER (0-0.5 m)		hook grass bush rice grass mosses *Blechnum discolor* *B. fraseri* kiekie	*Blechnum filiforme* kiokio *Hymenophyllum* spp	
EPIPHYTES AND CLIMBERS		supplejack kiekie	mangemange	

DISTRIBUTION: Found between 312 m and 600 m on slopes leading up to the plateau area.

NOTES: (No adequate differentiation could be made between low and mid-altitude forest types although some species eg. kohekohe and nikau are generally restricted to sites below 450 m a.sl.) Nicholls 1976 type B5

Native Fauna

There is no comprehensive information on wildlife present in the proposed reserve. A list of wildlife recorded during the 1983-84 fieldwork is given as Appendix 2. Appendix 3 lists the wildlife present in the Kauaeranga Block of the Coromandel Forest Park. The Wildlife Service have given this block which includes the Te Tipi area, an 'outstanding' wildlife rating.

Anderson (1983) states that kaka and Hochstetter's frog were found close to the southern boundary of the proposed reserve. Hochstetter's frog is entered as rare in the Red Data Book of New Zealand (Williams and Given 1981). Kaka has a limited distribution in the Coromandel (Anderson 1983).

There is also an unsubstantiated report of the rare blue mountain duck *(Hymenolaimus malacorhyncos)* from the northeast region of Te Tipi. (Tom Cookson - personal communication).

Introduced Animals and Forest Condition

Of 72 circular 4 m^2 plots examined throughout the proposed Ecological Area, intact goat pellets were present in 8 (11.1%), and possum in 2 (2.8%). Pig rootings were observed in the reserve and one goat was seen. Rats and mice were observed around Moss Creek Hut. Nowhere was there more than a light incidence of browse. Light browse was recorded on kiokio, kohekohe, kiekie, hook grass, wheki, *Asplenium bulbiferum, Astelia trinervia* and *Pneumatopteris pennigera.*

An instantaneous assessment of forest condition can do no more than identify probable indications of future change in the forest composition, structure and biomass.

Possible indicators of such changes are :

1. the presence of seedlings and saplings of canopy species;
2. the open-ness of the vegetation as a whole and in different tiers; and
3. the presence of dead or dying individuals.

The following relevant observations were made.

Throughout the reserve seedlings of the major canopy species including those of kauri and the podocarps are frequent. Although the plateau vegetation has been much modified, as evidenced by the many dead emergent trunks which occur there, the seedlings present suggest it is regenerating without apparent hindrance.

In the Rangihau catchment to the east, several canopy trees, particularly tawa, have fallen, leaving the occasional canopy gap.

Presence of Exotic Plants

Few exotic plants were recorded within the proposed reserve. Several exotic weed species occur especially around Moss Creek Hut. None pose any threat to the native vegetation.

Human History and Influence

There are no archaeological sites in the proposed reserve (New Zealand Historic Places Trust personal communication to Auckland Conservancy archaeologist).

Apart from Table Mountain, Te Tipi has been logged extensively for kauri (SCC 1979). The ruggedness of the terrain required resourcefulness and skill of the bushmen.

Logging of the Te Tipi region is described in detail in Reed (1964, p. 159-161). Logging of a 'magnificent' stand of kauri around the Te Tipi Stream began in 1909. 23,585 m^3 of timber were removed. A problem faced by these early bushmen was the Te Tipi falls - 60 m in height. If the timber had been driven over these falls it would have been totally destroyed. A receiving dam was built at the top of the falls and a 1.5 km long log chute was constructed down to the Rangihau River. Nearer to Table Mountain, logs cut were transported by rolling roads to the receiving dam. Camps were built on the Te Tipi plateau and the remains of an old hut were found near the Te Tipi Stream. Charcoal blackened stumps indicate that fire occurred.

A number of dams were constructed over the area. Remains of many of these still survive and Hayward (1972) notes the positions of some of them. As well, the log chute is said to still, in part, exist although it wasn't found in the 1983-84 fieldwork.

No mining is recorded for the Te Tipi area (Slane and White 1980). However an early Forest Survey Tally Sheet (NZFS 1948, no. 1111) describing a plot in the headwaters of the Waiwawa River within the reserve, notes several old mines.

Recreational Facilities and Opportunities

The tracks and huts which occur on the south-eastern edge of the reserve are part of the popular Kauaeranga Valley tramping network (see 'Access'). Over the year ending March 31st 1983, 642 signatures were recorded in the Table Mountain and 723 in the Moss Creek Hut visitor books. The track from the Rangihau Valley to Moss Creek Hut (track 14, NZFS 1983a) has recently been upgraded with a log corduroy surface (NZFS 1983b). The Table Mountain track is however notable for its deep mud and many obstacles.

Moss Creek Hut is a popular stopover with 24 bunks, a gas burner, a coal burner, a small wetback and toilet and water facilities. Impact of this hut is localised probably because of the frequent bad weather conditions at this altitude and the dense adjacent vegetation. A rubbish pit occurs near the hut and is always full. Holder et al (1983) recommend continued maintenance of the hut and the presence of

Photo 3: (right): Dracophyllum traversii or mountain neinei
(photo P. de Jager)

Photo 4: (below): Dam remains on Te Tipi stream. This was part of the holding dam above a waterfall from which the Te Tipi log chute led
(photo P. de Jager)

a hut warden over the busy summer period. Use of the Moss Creek Hut has increased over the last few years and this increase continues (Tom Cookson - pers. comm.).

The Waiwawa Hut is a six bunk hut with an open fire for cooking and heating. Side tracks from track 1 (NZFS 1983a) lead to and from the hut. Holder et al. (1983) suggest that the Waiwawa Hut be phased out as it occurs on the boundary of a No Development zone.

Summary, Discussion and Recommendations

The proposed Te Tipi Ecological Area (1620 ha) is centred on the Te Tipi plateau in the centre of the Coromandel Ranges. Included in the reserve are the summit plateau and escarpments of Table Mountain. To the west, the reserve extends down to the Waiwawa River whilst to the east, it reaches the Rangihau Stream. The rest of these two catchments form a No Development zone which almost surrounds the proposed Ecological Area.

To the west, the underlying rocks are andesitic (Beeson's Island Volcanics). These are conformably overlain in the east by rhyolitic ignimbrite sheets. The high altitude plateaus are formed from andesitic flows associated with the last period of volcanic activity in the Coromandel (Omahia Andesite). Soils are Aroha and Te Kie steepland soils in the west with Tangatara steepland soils fringing the central plateau area. Covering the high altitude plateaus are Rangiuru clay and hill soils. Finally, in the north-eastern corner, soils are Pukenamu hill soils.

I have classified the vegetation into three general types : unmodified high altitude podocarp-hardwood forest (Table Mountain); modified high altitude kauri-podocarp-hardwood forest; and low-mid altitude podocarp-hardwood forest with rare kauri. The proposed reserve contains a number of notable plant species including *Loxoma cunninghamii*, listed as vulnerable in the Red Data Book of New Zealand (Williams and Given 1981). Six other species rare in the Coromandel are present.

Kaka and Hochstetter's frog are recorded from the southern boundary. Both these species have limited distributions in New Zealand.

The Te Tipi plateau was logged extensively for kauri in the early decades of the twentieth century. One can find many old dam remains as well as a 1.5 km long log chute bypassing falls on the Te Tipi Stream. Fire has occurred over parts of the plateau. The summit of Table Mountain is considered virgin forest.

The southeastern border of the proposed reserve is well-developed for tramping. Well used tracks traverse this zone with Moss Creek Hut and Waiwawa Hut situated in the Ecological Area.

Huts are not desirable in an area zoned to protect fauna and flora. The high use of huts leads to high impact on the local environment through the cutting of live vegetation and littering. The Moss Creek Hut is a valuable part of the tramping system leading from Kauaeranga Valley and should obviously be retained. However special precautions

should be taken to ensure visitor impact is minimised. Holder et al (1983) recommend that the NZFS station a hut warden there over busy periods. I support this idea and also suggest that better facilities be made for rubbish disposal. (A suggestion is to place a large rodent-proof bin at the rear of the hut to receive rubbish. This, could when full, be lifted out by helicopter at the same time as fuel supplies are flown in). I also support Holder et al. (1983) who recommend that the Waiwawa Hut be left to degrade and its access tracks to overgrow.

The Table Mountain track is a difficult and unpleasant track to traverse. Where the track has become boggy, trampers tend to walk around the edges or form new tracks. Upgrading possibly with some form of log corduroy would make the tramp more enjoyable and less damaging to the unusual vegetation it traverses.

A short survey of this type cannot be conclusive about animal numbers or their impact. Goats are present but in low numbers; their sign is most conspicuous in the low altitude catchments to the east and west of the central plateau area. This population should be checked at its current low density to maintain the presently adequate regeneration. Possums and pigs appear to be at low levels but should be monitored.

Information on wildlife of the proposed reserve is lacking. The NZFS should conduct a more thorough investigation of the wildlife present in order to fully assess the ecological value of this area.

Management recommendations in order of priority are :

1. that NZFS control the goat population at the present low level or lower if practical;

2. that a hut warden be appointed to Moss Creek Hut over busy periods (Holder et al. 1983);

3. that the NZFS devise a means of adequately disposing of rubbish at Moss Creek Hut;

4. that NZFS upgrade the Table Mountain track;

5. that the Waiwawa Hut and its access tracks be left to degrade and overgrow (Holder et al. 1983);

6. that NZFS conduct a wildlife survey within the proposed reserve; and

7. that NZFS set up several permanent plots in different vegetation types to monitor vegetation trends. Particularly interesting is the regeneration occurring on the Te Tipi plateau.

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Appendix 1 : Botanical Species List - Proposed Te Tipi Ecological Area

Ferns

Anarthropteris lanceolata	
Asplenium bulbiferum var. *bulbiferum*	hen and chicken fern
A. flaccidum var. *flaccidum*	
A. oblongifolium	
A. polyodon	
Blechnum chambersii	
B. colensoi	
B. discolor	crown fern
B. filiforme	
B. fraseri	
B. nigrum	
B. sp. (forma a, *'B. capense'*)	kiokio
B. sp. (forma b, *'Lomaria latifolia'*)	
Ctenopteris heterophylla	
Cyathea dealbata	ponga
C. medullaris	mamaku
C. smithii	
Dicksonia squarrosa	wheki
Gleichenia cunninghamii	umbrella fern
G. dicarpa	swamp umbrella fern
Grammitis billardieri	
G. ciliata	
Histiopteris incisa	histiopteris, water fern
Hymenophyllum demissum	filmy fern
H. dilatatum	filmy fern
H. ferrugineum	filmy fern
H. flexuosum	filmy fern
H. lyallii	filmy fern
H. multifidum	filmy fern
H. revolutum	filmy fern
H. sanguinolentum	filmy fern
H. scabrum	filmy fern
Lastreopsis hispida	
Leptopteris hymenophylloides	heruheru
Lindsaea trichomanoides	
Loxoma cunninghamii	
Lygodium articulatum	mangemange
Paesia scaberula	hard fern, ring fern
Phymatodes diversifolius	
P. scandens	fragrant fern
Pneumatopteris pennigera	
Polystichum silvaticum	
Pteridium acquilinum var. *esculentum*	bracken
Rumohra adiantiformis	
Trichomanes reniforme	kidney fern
T. strictum	
T. venosum	

Fern Allies

Lycopodium billardieri
L. deuterodensum
L. laterale
L. volubile
Tmesipteris tannensis

Gymnosperms

Agathis australis	kauri
Dacrydium cupressinum	rimu
Lagarostrobos colensoi	silver pine
Lepidothamnus intermedius	yellow-silver pine
Phyllocladus glaucus	toatoa
Podocarpus hallii	Hall's totara
Prumnopitys ferruginea	miro
P. taxifolia	matai

Dicotyledon Trees and Shrubs

Alseuosmia macrophylla	karapapa
Archeria racemosa	
Beilschmiedia tawa	tawa
Brachyglottis repanda	rangiora
Carpodetus serratus	putaputaweta
Coprosma colensoi (banksii)	
C. dodonaeifolia	
C. grandifolia	mamangi
C. robusta	karamu
Coriaria arborea	tutu
Corokia buddleoides var. *linearis*	korokia
Cyathodes fasciculata	mingimingi
Dracophyllum latifolium	neinei
D. patens	
D. pyramidale	
Dysoxylum spectabile	kohekohe
Elaeocarpus dentatus	hinau
Fuchsia excorticata	kotukutuku
Geniostoma rupestre var. *crassum*	hangehange
Griselinia littoralis	broadleaf
Hebe macrocarpa var. *latifolia*	
Hedycarya arborea	pigeonwood
Ixerba brexioides	tawari
Knightia excelsa	rewarewa
Laurelia novae-zelandiae	pukatea
Leptospermum scoparium	manuka
Lophomyrtus bullata	ramarama
Melicytis ramiflorus	mahoe
Metrosideros robusta	northern rata
M. umbellata	southern rata
Mida salicifolia	maire
Myrsine salicina	toro
Nestegis lanceolata	white maire
N. montana	

Parsonsia spp.	
Phebalium nudum	mairehau
Pittosporum huttonianum	
P. kirkii	
Pseudopanax arboreum	fivefinger
P. colensoi	
P. crassifolium	lancewood
P. discolor	
P. edgerleyi	
Pseudowintera axillaris	horopito
Quintinia serrata	tawheowheo
Schefflera digitata	pate
Senecio kirkii var. *angustior*	Kirk's daisy
Weinmannia silvicola	towai

Dicot. Lianes

Clematis paniculata	puawhanganga
Metrosideros albiflora	climbing rata
M. diffusa	climbing rata
M. fulgens	climbing rata
M. perforata	climbing rata
Muehlenbeckia australis	
Rubus cissoides	bush lawyer

Dicot. Herbs

Centaurium erythraea
Drosera binata
Gnaphalium keriense
Nertera depressa
N. dichondraefolia
Viola filicaulis

Grasses

Chionochloa cunninghamii var. *conspicua*	
Cortaderia fulvida	
Microlaena avenacea	bush rice grass

Orchids

Corybas rivularis
Dendrobium cunninghamii
Earina autumnalis
E. mucronata
Pterostylis banksii

Other Monocots

Astelia fragrans	
A. nervosa	
A. solandri	
A. trinervia	kauri grass
Baumea tenax	
Collospermum hastatum	
Cordyline banksii	
C. pumilio	
Dianella nigra	turuturu
Freycinetia baueriana subsp. *banksii*	kiekie
Gahnia pauciflora	
G. xanthocarpa	
Juncus effusus	
J. gregiflorus	
J. planifolius	
Libertia pulchella	
Machaerina sinclairii	
Rhopalostylis sapida	nikau
Ripogonum scandens	supplejack
Uncinia uncinata	hookgrass

Appendix 2 : Wildlife of the Proposed Te Tipi Ecological Area

Native Birds

Anthornis melanura	bellbird
Hemiphaga novaeseelandiae	N.Z. pigeon
* *Nestor meridionalis*	kaka
Ninox novaeseelandiae	morepork
Petroica macrocephala	pied tit
Prosthemadera novaeseelandiae	tui
Rhipidura fuliginosa	N.I. fantail
Zosterops lateralis	silvereye

Native Amphibians

* *Leiopelma hochstetteri*	Hochstetter's frog

Mammals

Capra hircus	goat
Mus musculus	mouse
Rattus spp.	rat
Sus scrofa	pig
Trichosurus vulpecula	possum

* recorded by Anderson (1983)

Appendix 3 : Wildlife of the Kauaeranga Block, Coromandel State Forest Park

Native Birds

Anthornis melanura	bellbird
Apteryx australis	N.I. brown kiwi
Callaeas cinerea subsp. *wilsoni*	kokako
Chalcites lucidus	shining cuckoo
Gerygone igata	grey warbler
Hemiphaga novaeseelandiae	N.Z. pigeon
Hirundo neoxena	welcome swallow
Larus dominicanus	southern black-backed gull
Nestor meridionalis	kaka
Ninox novaeseelandiae	morepork
Petroica macrocephala	pied tit
Prosthemadera novaeseelandiae	tui
Rhipidura fuliginosa	fantail
Zosterops lateralis	silvereye

Introduced Birds

Acridotheres tristis	myna
Carduelis flammea	redpoll
Chloris chloris	greenfinch
Emberiza citrinella	yellowhammer
Fringilla coelebs	chaffinch
Gymnorhina hypoleuca	white-backed magpie
Lophortyx californicus	californian quail
Passer domesticus	house sparrow
Phasianus colchicus	pheasant
Platycercus eximius	eastern rosella
Prunella modularis	dunnock
Turdus merula	blackbird
T. philomelos	songthrush

Native Frogs

Leiopelma archeyi	Archey's frog
L. hochstetteri	Hochstetter's frog

Large Native Land Snails

Rhytida greenwoodi

Bats

Chalinolobus tuberculatus	long tailed bat

Introduced Mammals

Bos taurus	cattle
Capra hircus	goat
Sus scrofa	pig
Trichosurus vulpecula	possum

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