NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION NEWSLETTER

FOREST ARCHAEOLOGY IN THE AUCKLAND CONSERVANCY

John Coster
New Zealand Forest Service
Auckland

Introduction

The New Zealand Forest Service is responsible for the management of indigenous and exotic State Forests as well as forests on land leased from or managed on behalf of the owners. For administrative purposes the country is divided into seven units called conservancies. The Auckland Conservancy (Fig. 1) covers the northern third of the North Island, including the King Country, Waikato, Coromandel, South Auckland and Northland. For the last five years, the Conservancy has employed archaeologists to assist in the identification and management of the hundreds of archaeological sites affected by its operations.

The Forests Act 1949 and its later amendments (Anon.,1974,1977) give the Forest Service the responsibility of ensuring balanced land use and of taking historical, cultural and scientific factors into account for planning purposes. In addition, the Minister of Forests may gazette specific archaeological or historical reserves within State Forest. The Forest Service is further bound to the concept of site protection by the Historic Places Amendment Act 1975 (Anon.,1976) which protects all archaeological sites unless their modification is authorised by the New Zealand Historic Places Trust.

History

In 1942, well before the above legislation was implemented, most of Kaitieke paa (N18/82) in Waipoua Forest was excluded from planting in pine and left in native scrub, effectively preserving it in good condition up to the present time. This appears to have been the only action taken to protect sites (other then wahitapu) in the Auckland Conservancy until recently. In 1964, the New Zealand Archaeological Association approached the Forest Service, offering its co-operation in any attempt to protect archaeological sites from damage caused by forest operations. As a result, the then Director-General of Forests asked conservancies to make provision in working plans for the demarcation and preservation of archaeological sites (Poole,1964). Eighteen months later, the Association invited a speaker from the Forest Service (Morrison,1966) to attend a symposium on 'salvage archaeology and site protection in New Zealand' and this indirectly stimulated the Auckland Conservancy to compile a list of sites (including "cairns, burial grounds and fortifications") known to field staff (Levy,1966). No effective

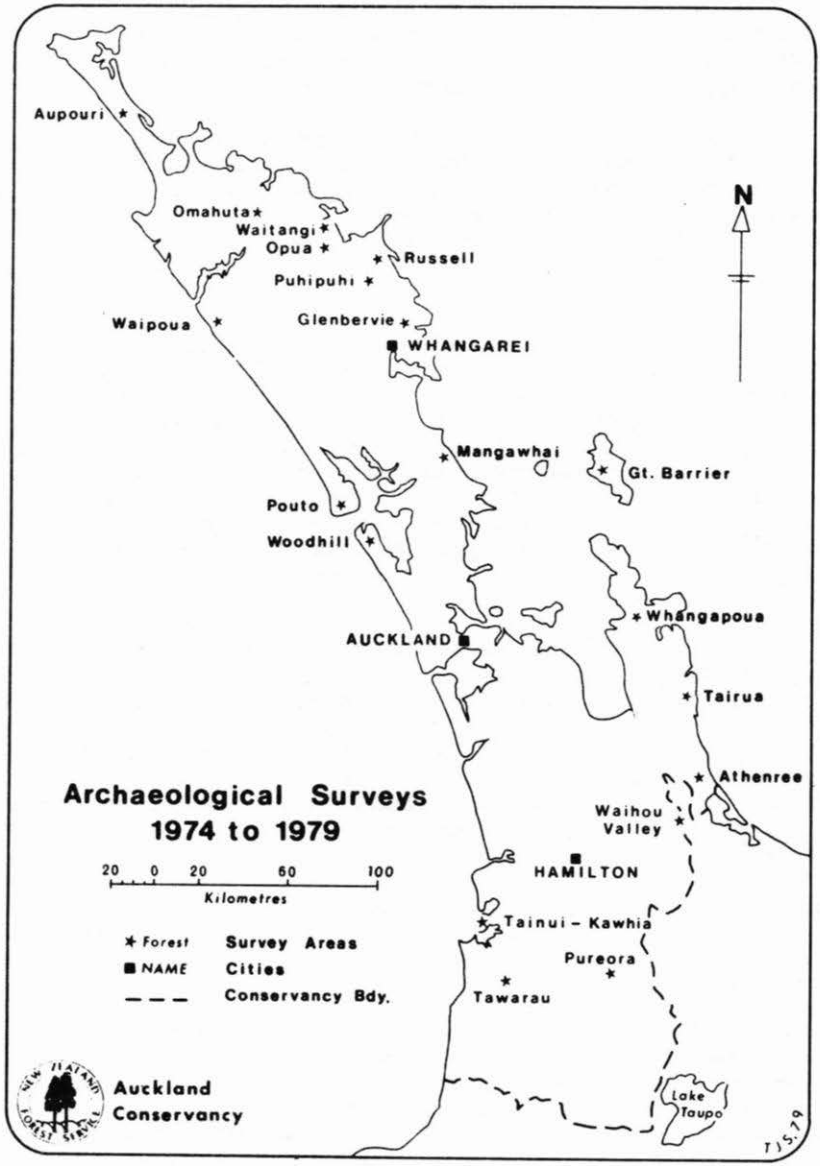


FIGURE 1. Auckland Conservancy showing forests surveyed.

action to protect the sites appears to have resulted, but in 1967 Janet Davidson, then archaeologist at the Auckland Museum, was asked to make a brief inspection of sand dune middens along Ninety Mile Beach, in Aupouri Forest. Her report to the Forest Service (Davidson,1967) provided a basis for later site surveys on Ninety Mile Beach.

At about this time the District Ranger at Kaikohe, Bob Lawn, a member of the New Zealand Archaeological Association, was recording Maori sites and traditions throughout Northland. He compiled a report (Lawn,1970) which was a valuable precursor to subsequent archaeological work, and also assisted members of the Auckland University Field Club to record sites in Waipoua Forest during the early 1970s (Atwell et al., 1973).

Otherwise, the Association's offer of assistance to the Forest Service was apparently not acted upon directly by either party, although intermittent contact between the Forest Service, the Association and the Historic Places Trust took place over the next few years. In 1973, six years after her inspection of Aupouri Forest, Davidson was asked by the Auckland Conservancy to assess a number of sites which had recently been discovered during land preparation in Whangapoua and Tairua Forests. The three sites which she recommended should be preserved (Davidson,1973) were excluded from planting and marked on forest maps (Plate 1). This is still the standard initial management for archaeological sites.

Davidson (1973) also suggested that the Forest Service should employ fieldworkers to inspect proposed planting areas, locate and record any archaeological sites, and recommend whether or not they should be preserved. In 1974 a pilot study was undertaken at Tairua Forest by John Coster and Gabrielle Johnston who recommended (1975a) that future field surveys should, for reasons of economy, generally be confined to land which had been cleared in preparation for afforestation. In the following two years, a number of archaeologists were employed on short-term contracts to carry out site surveys in other forests and in late 1977 Coster and Johnston were employed to conduct an overall archaeological assessment of the Auckland Conservancy and to recommend a two-to-four year programme of detailed inspections. Subsequently, they were employed on long-term contract to implement this programme. They have continued annual field surveys of land preparation areas but have become increasingly involved in the practicalities of site management (Coster,1979) and, more recently, in the training of Forest Service staff in site recognition and protection. The first local training session was held in Te Kuiti in October of last year, while discussion of "archaeological values in forest management" has been included in two recent courses held at the Forest Service Training Centre in Rotorua. Staff from the Historic Places Trust have assisted in these courses.

Forest Management

In the Auckland Conservancy, the Forest Service establishes and manages exotic (pine) forests in two main types of terrain - sand dunes and hill country (clay). The series of operations involved in the establishment, tending and extraction of tree crops in these two areas will be briefly described below.

Sand forests (see Wendelken,1974). Mobile coastal sand dunes can be stabilised by the planting of marram grass (Ammophila arenaria), followed by lupin (Lupinus arboreus) and, within an average of 4-6 years after marram establishment, pine seedlings (usually Pinus radiata). Planting of all three species is, wherever the terrain allows, carried out by machine rather than by hand. For marram, this involves a set of small ploughshares, drawn by a wheeled or crawler tractor, which open up a series of furrows about 1.2m apart and 10cm deep. Lupin is usually drill-sown 2-3cm deep, while the subsequent planting of trees is in parallel furrows about 3m apart.

The archaeological sites which occur in sand dunes are usually eroded shell middens exposed on the surface (Plate 2), and they are obviously subject to considerable damage from the series of operations described above. It is necessary therefore, that they should be located and clearly marked before marram establishment if they are to survive afforestation. They may be further protected by careful hand-planting of marram grass, which collects a covering up to a metre thick of windblown sand.

The tending of established forests involves pruning, followed by thinning at the approximate ages of 5 and 10-12 years. Thinning may involve the extraction of timber and consequent use of heavy machinery, which can further damage archaeological sites. The final operation to be carried out is the clearfelling of all trees at the age of about 25-30 years, a process which involves disturbance of the entire ground surface and the almost certain destruction of any archaeological remains at a depth of less than 0.5m. Following clearfelling, restocking with a new crop of trees takes place.

Clay forests. The establishment of pines on inland 'clay' country usually involves the clearance of scrub or gorse before trees are planted. This vegetation is generally sufficiently dense to make prior archaeological survey difficult or impossible. The process of 'land preparation' begins with the construction of firebreaks and major access roads while minor tracks are bulldozed along virtually every ridge and spur. This in itself is sufficient to severely damage the majority of pre-European sites which may exist in the area. Following roading, the

the scrub is crushed (either by gravity rollers or bulldozers) or hand-felled and burned, usually in late summer (February-March). Areas of easy contour may then be 'ripped' (resulting in a series of furrows about 0.5m deep and 3m apart) or giant-disced, to improve tree growth. Planting of trees is by hand during the winter (May-August) after which the tending and felling programme is much the same as that described above for sand dune forests.

It will be seen from the above account that the most appropriate time for archaeological survey is after burn-off, when the ground surface is clear, but before cultivation and planting further disturb any remaining sites (see Table 1).

Sand Forests Year	Clay Forests Year	Forest Operation	Archaeological Survey
-0.5	-	(Pre-Establishment)	Intensive
0	-	Marram planting	-
1	-	Lupin sowing	-
-	0	Land preparation	Intensive
5	1	Tree planting	-
9	5	Thinning	-
15	12	Thinning	Possible
30	25	Clearfelling	Salvage
1	1	Restocking	-

TABLE 1. Timing of forest establishment and archaeological survey (a simplified summary based on Wendelken, 1974).

Other operations. The Forest Service carries out a number of other activities which may adversely affect archaeological sites. Among these are the planting of coastal protection belts of macrocarpa (Cupresses macrocarpa), the establishment of kauri (Agathis australis) and other native

species, selective logging in native forests, and numerous peripheral pursuits such as roading, building, quarrying, fencing and recreational development.

The archaeological programme

The objectives of the Conservancy archaeological programme are to find sites, protect those which are of archaeological, historical or public significance, and ensure that those which will be destroyed are adequately recorded beforehand. It was decided early in the programme to restrict archaeological inspections to areas where sites will be threatened in the immediate future, since the total land area administered by the Auckland Conservancy (392,000 ha) is too large to be effectively covered by two archaeologists in a period of less than a decade or two. A further requirement for field surveys is that in most cases the ground surface should be relatively clear before inspection, because although it is possible to find sites in heavy scrub or forested areas, progress is necessarily slow and the pressure of development dictates that the maximum possible land area be covered in the time available. Field inspections are therefore restricted mainly to new plantings (about 4,000 ha per annum), either of trees in scrubland which has been crushed and burned, or of marram grass on sand dunes which are to be stabilised.

More difficult country, such as standing scrub, established pine or native bush may also be inspected, but only when a threat can be identified and there is good reason to expect that sites will be found. For example, a number of interesting agricultural sites have recently been found by staff in Waipoua Forest in areas which were planted in pine up to forty years ago. Again, a survey of the Opua recreational forest, in the Bay of Islands, (Clark and Molloy,1979) was carried out early last year so that walking tracks could be diverted away from the majority of known sites and visitor access encouraged only to one or two archaeological areas.

Site surveys for the Forest Service usually involve a thorough coverage on foot, requiring up to a month's fieldwork at any one time. Because they have been undertaken in areas where all vegetation has been burnt off, many of these surveys are exceptionally thorough. They can provide a useful comparison with fieldwork in similar or neighbouring areas where the ground surface is not so clear and where a lower proportion of the minor sites such as small middens and terraces might be detected. Once sites have been located, recorded and mapped, those which are considered important enough to protect are permanently marked and avoided during all subsequent forest operations (Coster,1979).

The principles applied in selecting sites for protection focus on the desirability of keeping a representative sample of the different types of site in any one area. Thus an attempt is made to preserve some of the smaller, less obvious sites such as terraces and middens, as well as the larger, outstanding ones, such as paa. Although the public may be encouraged to visit some sites, most are at present regarded as a long-term scientific resource with no immediate likelihood of detailed investigation or recreational use. Records of all sites are deposited with the New Zealand Historic Places Trust and with the New Zealand Archaeological Association's site recording scheme. It is hoped that ultimately a complete inventory of sites within the Conservancy will be compiled to aid site protection and general planning.

Results to date

In the last five years, a total area of over 23,000 ha in the Auckland Conservancy has been thoroughly surveyed for archaeological and historical sites. About 650 sites have so far been located, of which it is envisaged that about 120 (19%) will be permanently protected. European as well as Maori sites are recorded, since mines, logging camps, timber dams and tramways frequently occur in State Forest, and virtually any indication of past activities which are no longer carried out is included. Prehistoric Maori sites, however, form by far the greater proportion of sites encountered. Of these, the most frequent are shell middens (including a series of possibly Archaic coastal sites north of Mt Camel), but pits, terraces and fortified paa are not uncommon. More unusual sites, such as stone platforms, mounds and alignments, quarry sites, rock carvings and burials are also encountered. At Aupouri Forest, a large number of artefacts, including stone adzes, files, obsidian flakes, ornaments and fishing sinkers have been recovered from the sand dunes and these are on display at the forest's Information Centre (Coster and Johnston,1977).

Fieldwork has been undertaken in fifteen of the twenty-odd production forests and in four of the 140 or so indigenous forests in the Auckland Conservancy (see Fig. 1) but in only six forests (Aupouri, Pouto, Puhipuhi, Tairua, Waipoua and Whangapoua) has a large enough area been covered for the results to be of archaeological significance. From an archaeologist's viewpoint, this can be unsatisfactory, since the knowledge obtained is restricted to relatively small areas, usually well away from the coast and good soils where the main body of Maori settlement occurs.

Perhaps the most interesting results come from the Coromandel Peninsula, where sufficient data has been collected to indicate the inland limits of intensive Maori settlement. In three separate areas

of Whangapoua and Tairua forests, (Coster and Johnston,1975b,1978,n.d.) it has been found that the number of archaeological sites rapidly diminishes about 2 - 3km from the coast, on a line which probably corresponds to the pre-European bushline. A similar situation is indicated in Opua Forest where storage pits are located on ridge-tops about 1.5km from the coast but apparently not further inland (Clark and Molloy,1979). It is not implied of course that the Maori did not utilise inland resource areas but the archaeological evidence supports the assumption that occupation was much more intensive nearer the coast.

The influence of soil fertility in determining the nature and extent of Maori occupation is illustrated in Waipoua Forest, where large areas of prehistoric gardens (indicated by pits, stone mounds and stone alignments) have been found more than 5km up the valley of the Waipoua River (Plate 3), whereas the infertile gumlands on the nearby coast at Kawerua show very little evidence of Maori occupation (Atwell et al.,1973).

The surveys carried out by the Forest Service to date are only preliminary studies and are not to be regarded as completed research in any sense. A number of areas which would repay further intensive study have been identified, among which are the sand dunes of Aupouri Forest, behind Ninety Mile Beach (where Maori occupation was apparently both early and intensive) and a coastal block in Whangapoua Forest, near Coromandel.

Conclusion

The Auckland Conservancy's archaeological programme has so far been little more than a pilot study. The existing backlog of work, the need for consolidation of work already carried out, and the State's continuing progress in land acquisition and afforestation all emphasise the need for ongoing archaeological survey and investigation. It is apparent that site management, as distinct from site recording, will become an increasingly important part of the programme. The periodic re-inspection and assessment of protected sites will probably occupy a good deal of time in the future.

Acknowledgements

I am grateful for advice and technical services provided by staff of the New Zealand Forest Service, Auckland. Figure 1 is by Terry Small.

A modified version of this article appears in Forest Management Information (No. 11, February 1980), published by the Production Forest Management Division, New Zealand Forest Service, Head Office, Private Bag, Wellington.

References

Anon. 1974 Forests Amendment Act 1973. The Statutes of New Zealand 1973 2(122):1008-1011.

1976 Historic Places Amendment Act 1975. The Statutes of New Zealand 1975 1(40):331-336.

1977 Forests Amendment Act 1976. The Statutes of New Zealand 1976 1(45):576-577.

Atwell, E. Gael, G.F. Puch and R. Lawn. 1973 Archaeology of the Waipoua Region, Northland Part 1: List of Sites from Hokianga South Head to Maunganui Bluff. Tane, 19:103-110.

Clark, Paul and Chris Molloy 1979 Opua State Forest 117 Archaeological Site Survey, Summer 1978-1979. Unpub. report , File A778/5, New Zealand Forest Service (NZFS), Auckland.

Coster, John 1979 Exotic Forestry and Site Management in the Auckland Region. In McKinlay, J.R. and K.L. Jones (Eds), Archaeological Resource Management in Australia and Oceania. N.Z. Historic Places Trust, Wellington.

Coster, John and Gabrielle Johnston 1975a Tairua State Forest Archaeological Site Survey, November 1974. Unpub. report, File A478/1, NZFS, Auckland.

1975b Tairua State Forest (Wentworth and Ohui Blocks) Archaeological Site Survey, October 1975. Unpub. report, File A478/1, NZFS, Auckland.

1977 The Aupouri Forest Collection. N.Z.A.A. Newsletter, 20:263.

1978 Whangapoua State Forest Brier Block Archaeological Site Survey, April 1978. Unpub. report, File A478/6, NZFS, Auckland.

n.d. Whangapoua State Forest Otanguru Block Archaeological Site Survey, 1979. NZFS, Auckland, in prep.

Davidson, Janet M. 1967 Maori Middens on Ninety Mile Beach. Unpub. report, File 6/0, NZFS, Auckland.

Davidson, Janet M. 1973 Report on Inspection of Archaeological Sites in Whangapoua and Tairua State Forests. Unpub. report, File A478/1, NZFS, Auckland.

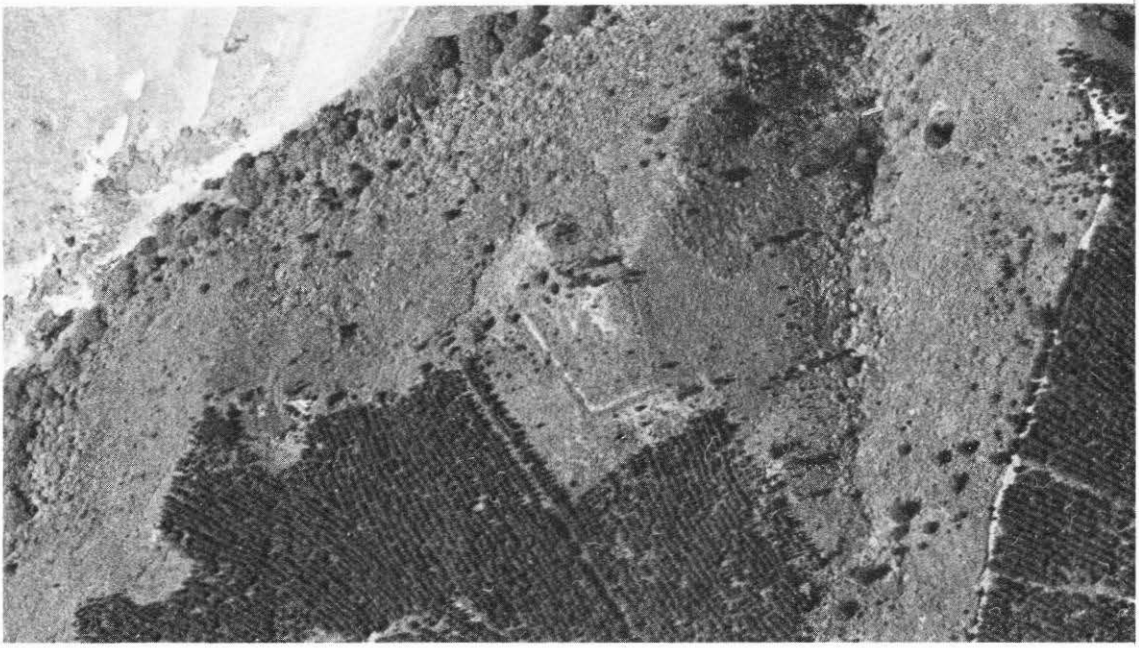
Lawn, R.G. 1970 Early Maori Occupation in Waipoua Forest. Internal report, File 6/0, NZFS, Auckland.

Levy, J.W. 1966 Sites of Archaeological Interest, Internal memorandum, File 45/18/1, 30 May 1966, refiled 6/0, NZFS, Auckland.

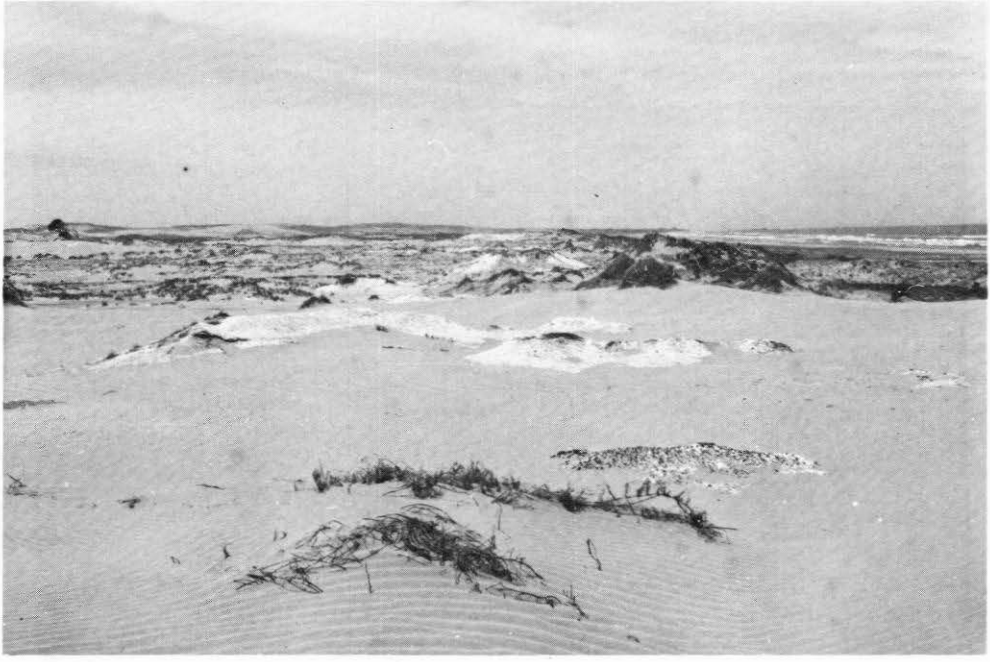
Morrison, F.T. 1966 The New Zealand Forest Service and the Protection of Historical and Archaeological Sites. N.Z.A.A. Newsletter, 9:142-143.

Poole, A.L. 1964 Preservation of Archaeological Sites. Head Office memorandum, File 1/7/8, 19 October 1964, NZFS, Wellington.

Wendelken, W.J. 1974 New Zealand Experience in Stabilization and Afforestation of Coastal Sands. International Journal of Biometeorology, 18:145-158.

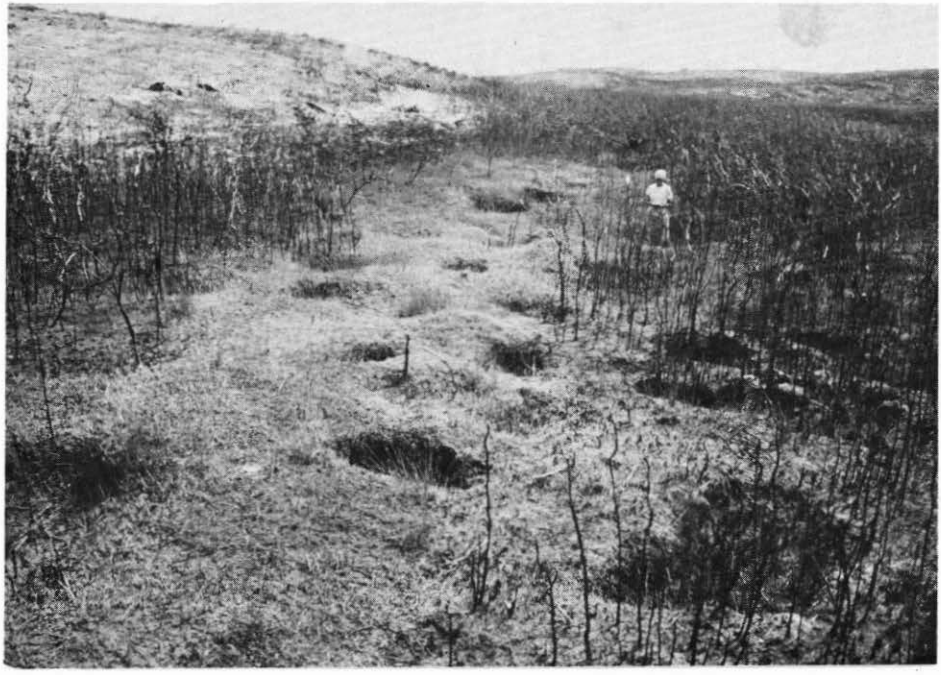


FOREST ARCHAEOLOGY Plate 1. **Paa** N49/95, Tairua State Forest. Aerial view showing L-shaped ditch and boundary of planted pines.



FOREST ARCHAEOLOGY Plate 2. Shell middens (N3&4/59, 60) on sand dunes, Aupouri State Forest.

FOREST ARCHAEOLOGY Plate 3. Stone wall (N18/87), Waipoua State Forest.
Scale is 40 cm long.



FOREST ARCHAEOLOGY Plate 4. 'Gumholes' left in drained swamp after extraction of kauri gum, Aupouri State Forest, Mt Camel Lease.