Return to previous file: sr90h.pdf

4.3 Mapoutahi, 144/17 GR 243943 (S164/13).

This pā is located on a northern promontory of the Otago Peninsula, projecting via a very narrow isthmus from the mainland, with white-sand beaches on each side, and an adjacent freshwater flax swamp. The irregularly-shaped peninsula bears low to medium high cliffs on all sides except the landward connection, and the cliffs adjoin reefs which support a dense growth of rimurapa (bull-kelp, *Durvillea antarctica*) (Fig. 31). Site plans show a number of terraces of irregular plan on most of the east-facing slopes, with the exception of a slightly steeper, far northern point within the cliffed circumference. Artificial defences are unusual in plan disposition. A long (140 m) lateral ditch lies inside the gently sloped area on the eastern perimeter (southern part). This ditch is approximately 2 m deep and 3-5 m wide over most of its length, with no interior or exterior bank. It appears to have been built to protect the relatively low cliffed approaches from the eastern beachfront.

Access today is by wooden steps rising from a track-eroded neck between the pā and the mainland. There is a distinct cut north-west of the track and steep entrance-way, possibly originally a transverse defensive ditch. However, in its present state it looks more as if it has been cut in recent decades to allow stock and people access into the pā. Most of the neck is suffering from uncontrolled erosion. No erosion is evident elsewhere on the pā.

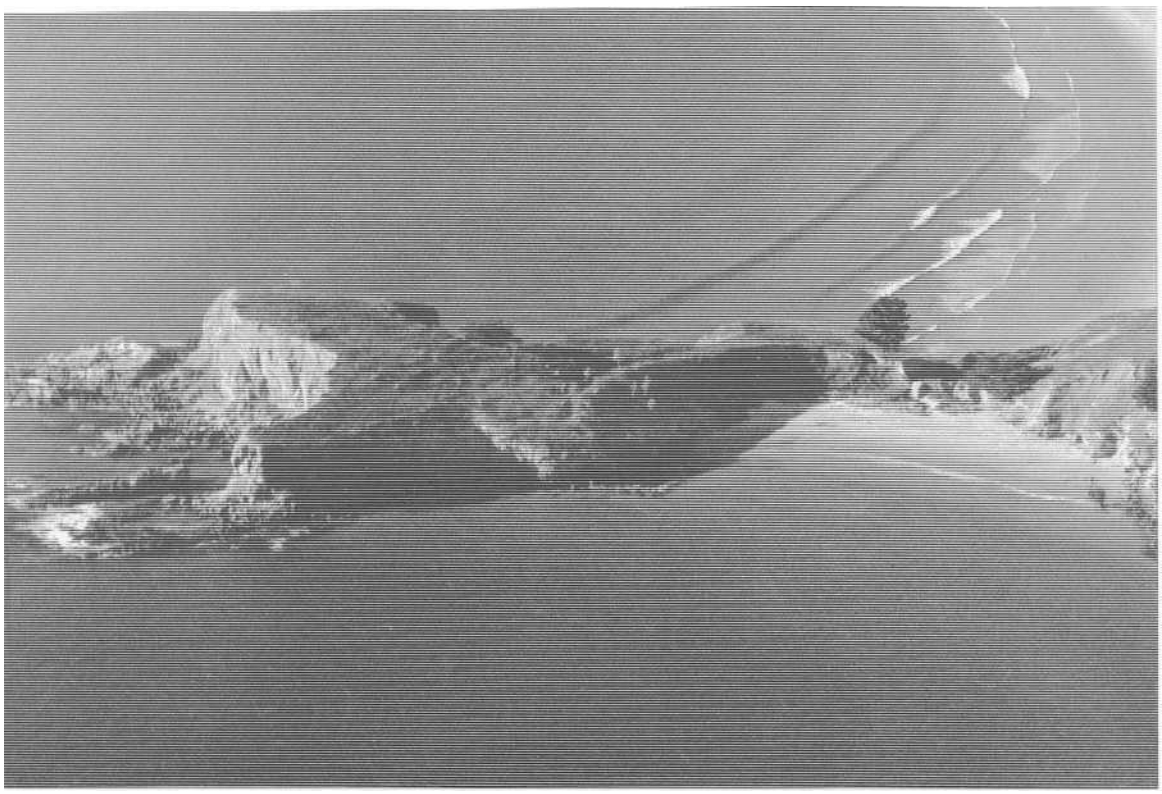

Figure 31 Mapoutahi (144/17) from the north-east in 1956. Note prominent lateral ditch and bank on north-western margin above the low cliff, cabbage trees, and the slightly ranker grass cover on the pā compared with the mainland. Note also roughly grazed grassland and single-stemmed cabbage trees. The macrocarpa (centre) and pine tree (right) are still present. (Photograph: White's Aviation/Air Logistics, Ref. 41133 (P)).

32(a)

32(b)

Figure 32(a), (b) Mapoutahi. (a) Dense cocksfoot grassland prevents establishment of most woody plants, but an expanding group of gorse (centre background) requires removal. Cabbage trees (multiple stemmed after fire) probably introduced by Maori. (b) Flax spreading into cocksfoot grassland from parent bush on crest of cliff.

Management

The dense grassland is being colonised by native species - bracken, flax, vines and trees. Introduced shrubs have been restricted by the denseness of the cocksfoot, but would spread if the grass is removed, or became less dominant. The dominant vegetative feature is the cabbage trees and these are probably culturally important. Although grazing has ceased, we understand that fire has been used deliberately to clear the vegetation so that the surface features (e.g., ditches) are visible. This tool should not be used here because it is damaging to the cabbage trees and regenerating coastal forest and exposes the area to weed invasion. The broom, gorse and elderberry should be removed completely by spraying or hand-cutting and swabbing with a brushweed herbicide. A few ragwort occur along open tracks, and these should also be removed although they pose no threat given the dense vegetation cover.

Muehlenbeckia australis (pohuehue) is an extremely vigorous vine in adjacent coastal treeland (māhoe, kotukutuku). It seems to be smothering some of the trees and may require control on the pā site to allow a forest cover to develop, if that were desired. The less vigorous species, *Muehlenbeckia complexa,* should be encouraged. The single macrocarpa and pine tree pose no real threat, but are also unneeded distractions from this aesthetically beautiful site, and their removal could be contemplated.

Improved access onto the site, to avoid soil disturbance, is a priority. The best solution would be separate wooden steps to the mainland ridge track on the south, and wooden steps to the pā on the north, with a wooden boardwalk taking the public far enough into open parts of the pa to disperse traffic. Once a boardwalk is installed, the neck, which is predominantly old wind-blown sand on a basalt base, should be stabilised in a suitable shrubland or native grassland or both. The management plan recommends scrub clearance and light grazing, in order to "manage the vegetation of the reserve in a manner which allows for visitor appreciation and protects the reserves historic and archaeological values" (Department of Lands and Survey, 1975). Site stabilisation followed by visitor appreciation should be paired objectives in vegetation management, and site stabilisation should be the primary consideration, otherwise there is nothing to appreciate except the wider landscape.

The management plan, drafted in 1972, reports "one small gorse bush" (there is now a patch of 30-50 plants) and only exotic grasses in the improved grassland (there are now several indigenous species). We have observed the replacement of exotic with native grass on other pā closed to grazing. Generally, we find the conclusion that "the reserve is of little botanical value" (Department of Lands and Survey, 1975) inaccurate, given the observation that the cabbage trees are probably planted and therefore historic, and few pā in New Zealand support such a dense population of them.

Natural regeneration will result in a cabbage tree and flax dominated landscape, surrounded by a ngaio/mahoe cliff-edge fringe. The present grassland will probably maintain itself for some decades and it should be monitored for shrub or tree species. If they are regarded as undesirable, on the grounds that a native grassland is desired in the longer term, they should be hand-weeded or cut as they begin to appear.

4.4 Shag River mouth, J43/2 GR 391227 (S155/5), **Shag Point.**

A verbal report (Bruce McFadgen, 1994, pers. comm.) that the moa-hunter site at the Shag River mouth was eroding led to our brief inspection. The landforms consist of a coastal sand-spit between two headlands, with the river mouth located adjacent to the northern headland (Shag Point) (Fig. 33(a)). The site covers an area of about 2 ha on the proximal areas of the spit, inland of the active coastal dunes and extending out into clayey deposits, part of the surface of which is exposed below the H.W.M. The site provided key evidence to demonstrate Haast's hypothesis about the early nature of moa-hunting, compared with later "Maori" [Classic Māori] middens (Anderson, 1989: 104-105). These appear to have lain in a distinct chronological sequence, although many references are simply to the striking richness of moa bone in surface scatters. Parts of what is now a salt marsh or its eroded margins were described by Haast as "literally paved with moa bones" (cited in Anderson, 1989: 134). Following the time of Haast, Hamilton in the 1890s and Teviotdale in the 1920s also excavated here, the latter making particularly important records of settlements such as stone-lined hearths (indicating the presence of permanent houses).

On our visit, at high tide in a south-easterly gale, little surface-evidence was to be seen. However, we were able to view the mechanism by which the wave erosion was taking place at high water in high winds. In the southerly conditions, wave surges at the river mouth travelled for some distance inland. We noted some oven stones embedded in the eroding clay at the estuarine edge of the salt marsh but little else. The erosion and land-formation process is reviewed in the following section.

Vegetation and erosion process

The spit encloses an estuary largely infilled with salt-marsh dominated by *Sarcocornia quinqueflora* (glasswort, ureure). The archaeological site covers the proximal, inner margins of the spit, and also extends out on to the *Sarcocornia* marshland. The site is disappointing as far as surface features are concerned, there being no obvious signs of former habitation apart from scattered hangi rocks and occasional quartz pebbles that could be moa gizzard stones. The spit itself is mostly covered in marram grass and tall fescue, with scattered boxthorn. The river mouth end is constantly extending and retreating. An elevated view from Shag Point to the north indicates that wind-blown sand extends inland into the estuary (Fig. 33(a)). Conversely, the character of the estuarine vegetation suggests that sedimentation from the Shag River is elevating the surface so that it is gradually drying, the *Sarcocornia* salt-marsh becoming colonised by the coastal tussocks (? *Puccinellia stricta)* and, in one place, gorse and tall fescue. (Fig. 32(b)).

The combined processes, resulting in a buildup of land, concentrate the deeper estuarine water to a zone immediately behind the sandspit and also create a sharper edge to the river-estuary margin: it is this margin that is eroding. The process has been going on for decades and the margin has eroded some 20 m over the last 50 years (McFadgen, pers. comm.). On the salt marsh flats, the erosion edge is about 30 cm tall and is generally protected by a mat of *Sarcocornia* and *Sueda novae-zelandiae,* drift-wood and

33(a)

Figure 33(a), (b) Shag River Mouth. (a) Active erosion and breaching of the dune barrier is threatening the ancient moa-hunter site bordering the estuary (centre). (b) Modern sedimentation of the *Sarcocornia* beds is resulting in colonisation by grassland. Wave action is eroding the underlying older sediment containing moa-hunter settlement materials.

33(b)

rafts of seaweed, the mass of which is greatly reducing the effects of the waves (Fig. 33(b)). However, where no protection exists a bare soil face is exposed consisting of mixed sand, mud and humus (the humus layer clearly containing charcoal). Scattered, irregular (broken) hangi rocks have been washed out of the soil, and some of these now lie under water. At this interface, it appears that sand is intermittently washed and blown a short distance up on to the salt marsh, providing drier ground on which grasses are establishing and out-competing the *Sarcocornia*. It is possible that there was a zone of estuarine (i.e., west-facing) foredune at the time of occupation, which has subsequently eroded. On the spit itself, the inland margin of the dunes is exposed to estuary wave action, and on the northern limit of the moa-hunter site presents a recently eroded steep face some 1.5 to 3 m high, clothed in marram grass. This is currently stable but evidently could be activated in the course of a single storm event with high water and westerly winds.

If the erosion of the *Sarcocornia* edges is regarded as highly undesirable, it would be possible to install some form of wave baffle or barrier immediately forward of the erosion face. The exact form of this could be the subject of discussion with an engineer. Cost is not likely to be high, given that the wave energy and currents are slight.

It seems likely that this estuary is changing quite rapidly into drier land and that the river is becoming slightly more entrenched. Whether this process is undirectional is difficult to evaluate. The spit is inherently unstable, although the moa-hunter site proves its continuous existence for 600-800 years. The vegetation is unstable however, suggesting continual rejuvenation. Clearance of the Shag River catchment for farming may well have increased sedimentation over the last 100-200 years, over and above the Polynesian-induced sedimentation regime, and this seems to be the likely reason for replacement of the present area of salt-marsh with grassland. It is disappointing to see 4WD tracks across the estuary, given its delicate condition and the importance of its stability.

Management

The degree of erosion of the spit-estuary margin soil is limited and probably of little concern. The health of the vegetation of the spit is important, so that fresh sand inundation from the active dunes near the beach is restricted and the possibility of invasion by the sea reduced. The efficacy of marram grass as a long-term stabilizer is debatable. Archaeologists currently involved with research at the site seek to have a grassland with occasional grazing on the site area. Grass cover has occurred on the site in the past, but evidently has not succeeded in holding on (see our observations above). This is probably because of summer and autumn droughtiness on these sandy soils. This area is in dire need of woody vegetation, which is sparse at present. We would suggest a coastal revegetation programme aimed at replacing marram grass with shrubland toward the distal end of the dunes, and an archaeologically suitable shrubland cover for the area of the known site at the proximal end of the spit. Archaeologists note that although the site is disturbed, it has many intact areas at more or less unkown depths below the modern ground surface. Some specimen cabbage trees, and a more general cover of flax and poroporo may be suitable.

The estuary vegetation is changing, probably toward a more stable grassland. Under natural conditions this would eventually lead to coastal forest. Weed invasion (gorse and tall fescue) is likely if this continues, and this will lower the "indigenousness" of the area. Vehicle access across the estuary should be prevented, perhaps by improving foot access to the site. We do not believe that erosion of the salt marsh margins poses a real problem. Its rate is very gradual. We were not able to form a judgement about the state of archaeological deposits in the former salt marsh clay substrate below the H. W M.

Shag Point

A reported umu tī (cabbage tree hangi) took us to Shag Point (yellow-eyed penguin colony, abandoned coalmine, seal and sealion haulouts), and to a bay immediately opposite the Shag River mouth. The validity of the umu tī report was not confirmed. However, the vegetation was revealing in other ways. As we have commonly observed on pā, exotic grassland, when retired from grazing, can be gradually colonised by indigenous grasses. Here, silver tussock is rapidly spreading across the slopes. Significantly, seedling flax are particularly common within the tussocks themselves, perhaps germinating in the humus that the decaying leaf bases form, an interesting demonstration of the distinctive synecology of the tussock form. Flaxes are dominant over the slope, conforming to a widespread but local coastal Otago habitat: hillslope flax and cabbage trees. In this area cabbage trees are very rare, but their occasional presence does lend credence to the identity of pits as umi tī. Yellow-eyed penguin use flax, tussock and mānuka as nesting and sheltering habitat, so the gradual replacement of farmland and recolonisation of the coalmine area with indigenous habitat is likely to be beneficial to them.

With respect to management, we note that gorse is colonising former farmland and preventing interpretation of the archaeological features of the area, as well as detracting from the high ecological and recreational values.

CANTERBURY

4.5 Māori rock drawings, Pareora, South Canterbury

Fiona, Lady Elworthy, Craigmore Station, had invited us to view her cabbage tree management activities (fencing patches of trees, and experimental protection of individual trees) and we took the opportunity to view some of the rock art on the station. The art and cabbage trees are not unrelated, because both occur on limestone country where erosive forces have created caves and outcrops. The caves formed shelters for the people and protection to the art work, and the rock outcrops formed open sites on which cabbage trees could survive within an originally forested landscape.

4.5.1 Te Puke o Tahurua, J39/18 GR 497406 (S111/7).

This Queen Elizabeth II National Trust protected cave is a simple overhang with a dry, rocky, floor area of about 10 m^2. The outer part of the roof contains one of the famous "eagle" paintings. The reserve lies at the head of an attractive small open valley with a south-western aspect, between two downland surfaces (Fig. 34(a)). Pleasant views of the valley and the hill country towards the southern alps are enjoyed as one follows a simple track down to the cave. The retention of these views, both in near- and far-perspective, may have a bearing on the management of forest succession that is occurring on the limestone scarps - māhoe, kapuka (broadleaf), kowhai and tī kouka. A sensible compromise may be to maintain some cleared and tallgrass areas alongside the track especially by the cave.

Vegetation and management

A zone of remnant native trees and exotic grasses is reverting to a shrubland: broadleaf, cabbage trees, matagouri and *Coprosma propinqua.* In the absence of grazing, broadleaf (*Griselinia littoralis,* kapuka) are seeding into the reserve, including rock crevices immediately in front of the cave entrance (Fig. 34(b)). If they grow into trees it is likely that these would create too much shade (and therefore moisture) in the cave, and encourage the growth of algae on the cave surface, thereby threatening the art work. They should probably be removed. A vigorous growth of pohuehue (*Muehlenbeckia australis*) is scrambling over the fences and is said to compromise the efficiency of stock-proof fencing. It will also scramble over shrubs and young trees, as we saw elsewhere in this district, and may warrant selective removal.

Roots emerging from the roof of the cave appear to be from matagouri, because they bear small nodules (nitrogen-fixing nodules?). Heavier than normal rainfall has percolated through the cracks followed by these roots and young ferns have grown. This situation needs review by a rock art specialist. The identity of the ferns was not determined, but it is interesting to note that the one fern noted in the reserve was *Dryopteris felix-mas,* an introduced European species. Its presence is decidedly out of character with the site, and its potentially invasive character could impose unwanted stress on the cave environment.

Continue to next file: sr90j.pdf