TRAIL BIKE DANGER TO SAND DUNES

The dangers to coastal dune areas by trail bikes are pointed out in this article by Terry Healy, Senior Lecturer in Earth Sciences at the University of Waikato, which he wrote in response to a recent article in "People and Planning."

The recent article "Planning Study Backs Trail Bikes" (*People and Planning* December 1977) has serious connotations for coastal local authorities if taken too literally.

While it can be accepted that trail bikes may be a legitimate form of recreation activity, they are nevertheless extremely damaging to the environment, and may cause erosion damage which requires costly and unnecessary conservation and protection measures.

On hill country such activity destroys the vegetation, decreases soil pore space and promotes channelling of runoff, thereby increasing the risk of unwanted and rapid gully development.

The damage resulting from uncontrolled trail bike and four-wheel drive vehicles on coastal sand dunes can be even more serious, as such activities are extremely deleterious to the sand dune vegetation. It hardly needs emphasising that unconsolidated Holocene sands which comprise most of New Zealand's dune fields, are extremely susceptible to wind erosion if the protective vegetation is damaged.

In this context it is especially necessary for coastal local authorities to be aware of the role of frontal dunes in the erosion-accretion cycle. (See: Healy T.R. *et al* (1977): *The Bay of Plenty Coastal Erosion Survey).* The frontal dune is widely regarded as an integral component of the nearshore-beach-dune system. Its main role is in acting as a **reservoir of sand** which may be available to nourish the beach during severe wave activity. During the infrequent but extreme intensity storm, most of the frontal dune will be cut out. Subsequently at times of long low swell waves, sandy sediment is brought onshore from the offshore bar and deposited on the berm face. Onshore winds blow dried sand from the berm and back beach on to the dune where it is trapped by vegetation, thereby building up the dune.

VEGETATION

Vegetation cover is of fundamental importance for binding the loose non-cohesive dune sands, for if the cover is destroyed the sands will be subject to erosion by wind. After a storm episode of cut some of the vegetation may be destroyed, but in time the creeper grasses such as Marram and Spinifex will provide a stabilising influence. Clearly it is essential that the frontal dune vegetation cover be protected from disturbance by overgrazing, burning, trail bikes, dune buggies and the like, and concentrated pedstrian traffic, and the dune be permitted to regain its natural shape.

Quilty and Wearne (1975) examined beaches in New South Wales, Australia, after a period of extreme coastal erosion. They noted that beaches with well developed, well vegetated frontal dunes, without houses constructed on them, recovered rapidly from the erosion. The vegetation trapped and stabilised sand that was blown into the dunes by non-storm, onshore winds. Where there was real estate development, vehicular and pedestrian traffic, the dunes were not as well vegetated and sand was blown inland and lost from the system.

Following storm cuts into the frontal dune, the dune exhibits a steep scarped or faceted face. Frontal dunes in this condition are in a particularly hazardous and unstable state. Should strong onshore winds occur, any disturbed section of the frontal dune will be subject to wind erosion inititating 'blow-out', and parabolic dune formation. Where this happens on a large scale extensive areas of wind blown sand move inland as transgressive sand sheets as at Piripai and Bowentown.

DAMAGE

One example of the actual damage of trail bikes alone on the Bay of Plenty coast is illustrated. Figure 1 shows an area of the Papamoa dunes, Bay of Plenty, taken in January 1973. Only two foot tracks lead through to the beach. Three "moderate" sized blowouts are evident, otherwise the dunes are well vegetated.

Figure 2 shows the same dunes in February 1977 — after the advent of trail bikes. A plexus of anastomosing trail bike tracks covers the dunes. The extend of loose exposed sand has markedly increased and the swales which 4 years previously were well vegetated are now large areas of loose blowing sand. But more seriously deflation has increased especially along the frontal dune.

Should such trail bike activity increase it will undoubtedly require remedial conservation measures by the land owners.

At a local authority level it may be necessary to invoke control of trail bike areas on dune-lands. In certain parts of the Queensland coast, trail bikes, dune buggies and 4-wheel drive vehicles are banned within 1000 m of the coast, and New Zealand may need to follow this lead.

Alternatively the local authority could "manage" such activities by:

i) prohibiting all vehicles within 100 m back from the toe of the frontal dune in order to preserve the natural character of the shoreline as required under the Town and Country Planning Amendment Act (1973), and

ii) permitting certain demarcated dune areas open to the activity for one season. Subsequently it would be closed for some years to allow regeneration. Such a scheme would require fencing off, revegetation and management costs.

To conclude, to even suggest by implication that trail bike and related activities should be permitted in coastal and especially foreshore dune areas, is extremely bad planning advice because:

i) it will undoubtedly facilitate destruction of the natural character of the shoreline, which is contrary to the Town and Country Planning Amendment Act (1973),

ii) it will definitely have a deleterious effect on the sand binding grasses, and

iii) may lead to accelerated frontal dune erosion, and deflation as seen at Papamoa ●

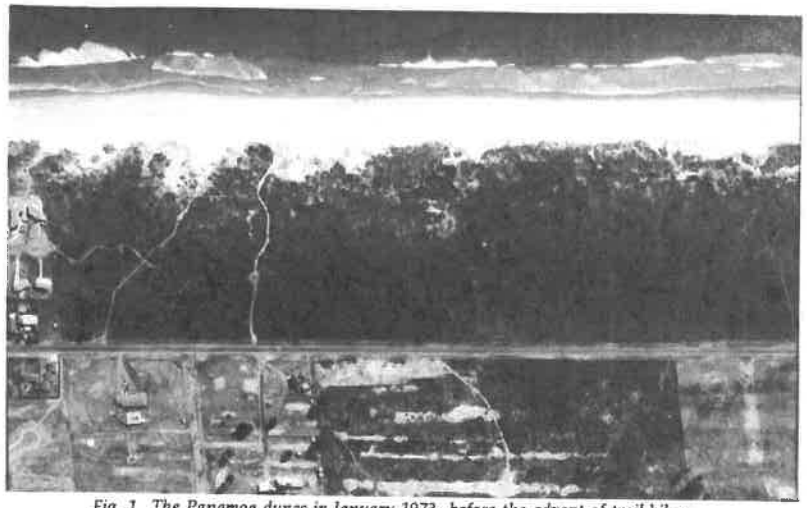

Fig. 1 The Papamoa dunes in January 1973, before the advent of trail bikes.

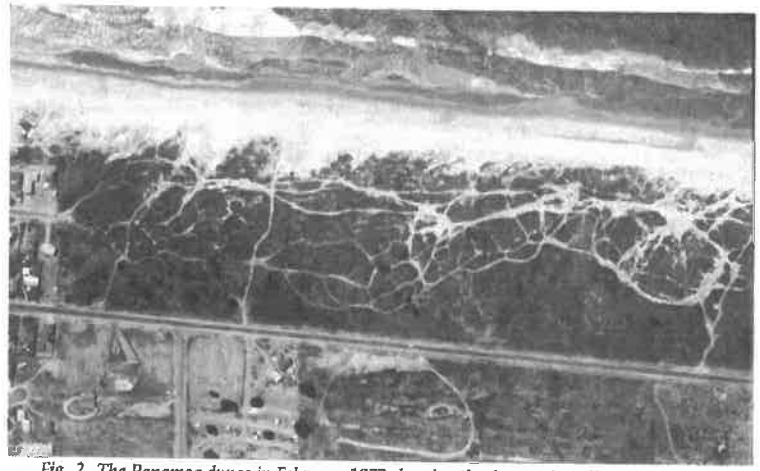

Fig. 2 The Papamoa dunes in February 1977 showing the destructive effect of trail bikes.