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A HYDROLOGICAL COMPARISON BETWEEN TWO WATERSHEDS
IN POHANGINA COUNTY

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of
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FRONTISPIECE - PLATE 1

Oblique Aerial View of Study Catchments from Ridge Road Looking
towards the Pohangina River



SUMMARY

Sequential aerial photographs taken in 1946, 1958, 1966 and 1972 were used to study the changes in erosion and vegetation over two adjacent catchments in the Pohangina County, 35 km north east of Palmerston North. Infra red colour and Kodachrome prints were used as well as black and white film for added interpretive value.

The major problem in these watersheds is the severe canyon gullying that occurs in the unconsolidated Castlecliffian Sand underlying this area.

Number 1 catchment (240 ha) is in a more critical state with regard to erosion, than Number 2 catchment (200 ha). It yielded extremely low dry weather flows, with much of the streambed completely dry except in flood events, or fed only by seepage from small springs. Reasons for the significant differences in the behaviour of the two catchments are suggested.

Attempts were also made with limited resources to look at the flood levels and sediment loads contributed to the Pohangina River by these catchments. It was calculated from a flood 10/3/72 that sediment loads in the order of 3 tonnes/min could be reached at the flood peak. Mechanical analyses showed that 80 per cent of this load falls in the size range of fine sand.

Using a mirror stereoscope and simple morphometric and photointerpretive methods, the physical factors contributing to the erosion and headward gully movement in the two catchments were compared and a series of deductions made in conjunction with the history and management of the properties involved. Headward gully movement and increased erosion was proposed to result from climatic events and changes as well as the removal of large areas of scrub and regenerating native bush on the gully sides. Fencing off

the gullies, complete withdrawal of stock from them and allowing unrestricted regeneration of native species coupled with the planting of exotic trees and the erection of conservation structures should have been instigated as soon as the problem became apparent. These measures have also been advocated by other workers and organizations for similar problems in the same area.

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