 RUN BOUNDARY

0 1 2  
 kilometres  
 scale 1:50 000

File Ref : P 271/272 Map Ref : F41, G41

**Map 1  
 MT PISA**



**RUN 627**

3712.9908

LABRADOR PARK

**RUN 629**

6673.2662

Colour

Burn

Prince Burn

Lucy's Burn

Burn

Cliff

Burn

D.A.

Column Rocks  
A.F.

PISA

**PT RUN**

433

Gordon Rock  
S.N.

Mt. Dorrrel  
S.V.

CARDRONA

CROMWELL

Mitre

Creek

PACK

6  
739.7536

Stretford

Creek

Low

Burn

**PT RUN 634**

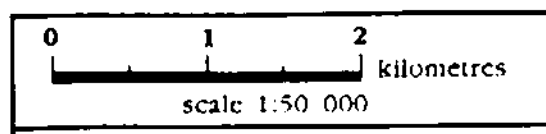
5814 1920

TRACK

Stream

ROARING





Skeleton

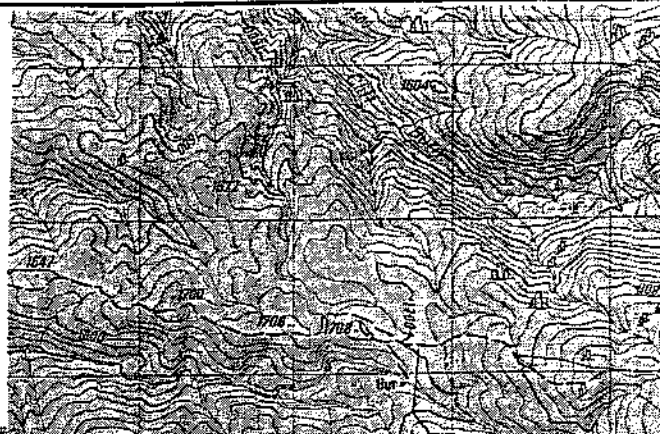


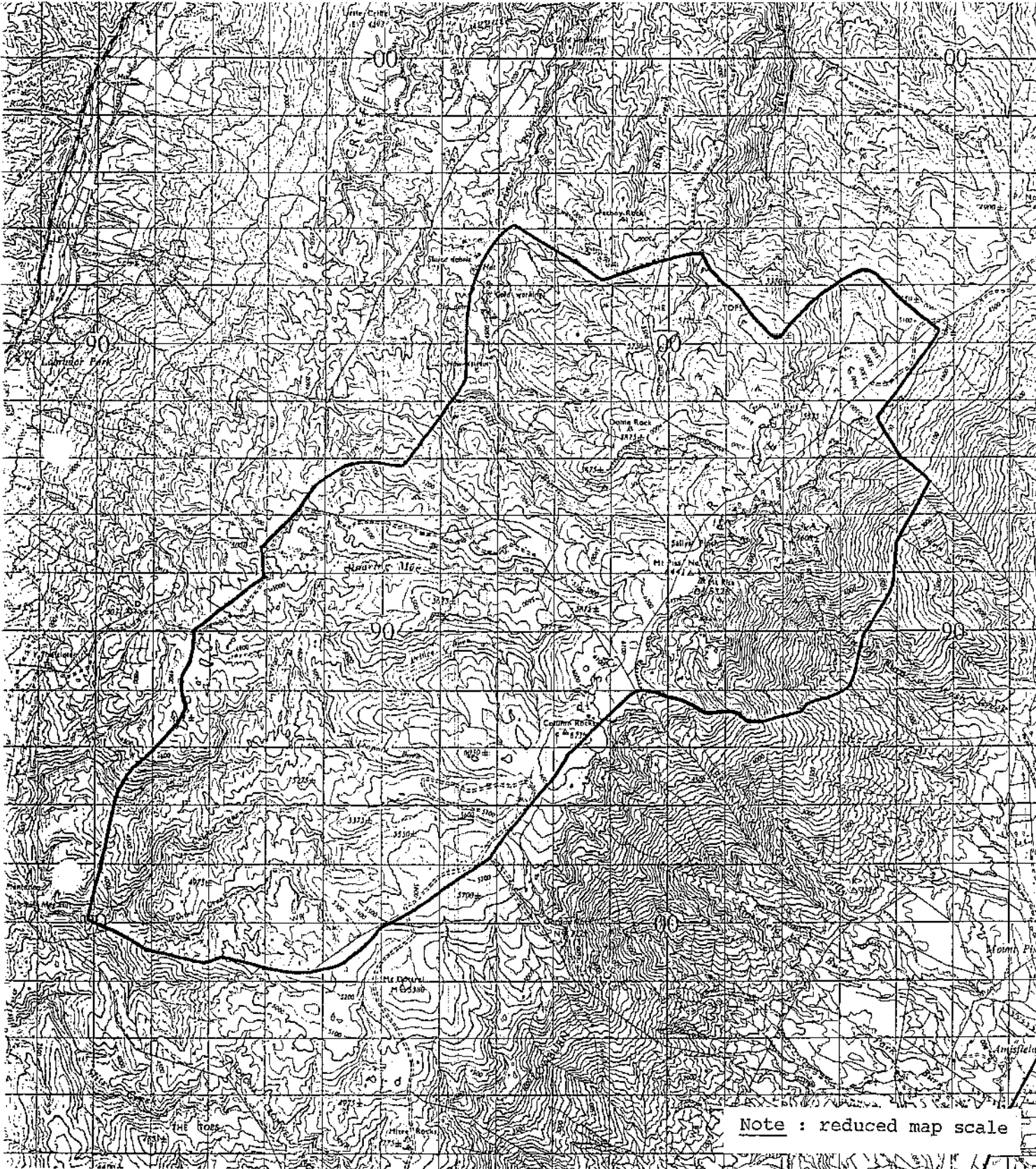
# Map 2 MT PISA CONSERVATION RESOURCE

File Ref: P 271/272 Map Ref: F41, G41



-  NATURAL VEGETATION BOUNDARY
-  APPROXIMATE UPPER FENCELINES
-  CONSERVATION COVENANT
-  RAP PISA A3





Note : reduced map scale

GR CENTRE  
AREA  
ALTITUDINAL RANGE

NZMS1 S124 975909  
8560 ha  
670m - 1960m

Pisa A3: PISA TOPSLANDFORM

A large area encompassing about half of the gently west-tilted summit plateau of the Pisa Range and a smaller segment of the steep eastern fault-scarp face. Generally high altitude - two thirds of area is above 1500 m.

The top of the eastern face is a continuous line of glacial cirques. Steep cliffs, derivative slopes and small talus cones form the cirque walls. Cirque floors have complex microtopography including tarns, ice-worn rock outcrops and moraine deposits, modified by solifluction since deglaciation.

At maximum glaciation, ice spilled downslope to below 1000 m from the large complex cirques below the main Pisa summits flanking Sallys Pinch. Slopes below the smaller cirques to the north are slumped ripply colluvial slopes unmodified by glaciation.

The impact of glaciation on the summit plateau is localised. The Lake McKay and Cliff Burn basins are unusual glacial valleys without the steep headwall normally characteristic of cirques. Instead snow accumulation was concentrated on the lee side of the valleys relative to strong northwest winds. Successive west-trending valleys south of Cliff Burn show a transition of glaciation intensity through incipient glaciation and large-scale nivation to essentially fluvial valley form in the south.

Ridges generally have smooth rounded profiles except for scattered tors. The contrast between the smooth plateau surface and the abrupt edge of the eastern face is dramatic. The most exposed sites on the summit ridge have lag gravels and stone pavements. Soil hummocks cover a large proportion of the area on ridges and gentle slopes. Other periglacial phenomena are well developed, especially solifluction lobes on shady slopes; some associated with snowbanks are still active.

Alluvial surfaces are prominent below 1500 m in Roaring Meg and tributaries and below 1400 m in Luggate Creek tributaries. Peaty valley-fill wetlands are further developed on alluvium in some valleys.

Towards the southwest of the priority area near the edge of the plateau, streams become deeply incised in steep-sided valleys, contrasting with the gently undulating topography of their upper reaches.

Haast Schist basement rock is overlain by quartz sands and gravel of the Manuherikia Group in a small area at the NW extremity of the priority area west of Princess Burn. The sediments were previously worked for gold, hence several water-races and patches of sluiced ground in this area.

Upland hygroscopic yellow-brown earths cover most of the priority area; stony Obelisk soils near the main summit ridge, Carrick soils elsewhere on the undulating plateau surface, Dunstan soils on the steeper lower valleys and down the eastern face till they grade into yellow-grey earths near the lower margin of the area.

## VEGETATION

High alpine cushionfields and short and tall tussocklands dominate a wide-ranging altitudinal sequence of vegetation types.

Dracophyllum muscoides cushionfields are very extensive on exposed sites above about 1600 m on the summit plateau. Cushion communities are diverse and vary markedly according to local site factors. Raoulia hectori, blue tussock and Celmisia viscosa are major associated species, often co-dominant. The alpine rush Marsippospermum gracile is scattered or locally dense on damp sites.

On sites of extreme exposure with lag gravels, the rich species diversity and high proportion of ground cover generally characteristic of cushionfields is reduced to sparse cushions and tufts of a few species including Poa pygmaea, Luzula pumila, Anisotome imbricata and Chionohebe thomsonii.

At its lower limit, cushionfield gives way to blue tussockland or alpine fescue - blue tussockland. This boundary is commonly abrupt on sunny faces at a little under 1700 m and may be marked by a greater concentration of Celmisia viscosa in cushionfield.

The complexity of landform within cirque basins is responsible for an intricate mosaic of distinct communities. Talus slopes are colonised by very sparse vegetation including Epilobium tasmanicum and Cotula goyenii with Raoulia youngii and Colobanthus buechananii on slightly more stable substrate. Snowbanks persist into mid or late summer with associated communities characteristically including Raoulia subulata, Celmisia haastii, Cotula goyenii, Ranunculus pachyrrhizus and Caltha obtusa. Typical flushes have a cushion vegetation dominated by mosses, Carex gaudichaudiana and Oreobolus pectinatus and a similar community is found on wet areas around tarns. These "specialist" communities are also found more widely dispersed on appropriate sites within the non-glacial or incipiently glacial valleys of the summit plateau.

Hummocky terrain around rock outcrops and moraine on cirque floors have a variety of cushionfields and blue tussockland with slim snow tussockland on colluvial slopes, extending down valley beyond the cirque floors.

Slim snow tussockland is generally best developed on shady faces below 1700 m, although the valley draining north from Lake McKay also has extensive dense slim snow tussockland. On the open valley sides on the plateau, dense slim snow tussockland is found only on a few patches up to 30 ha, although individual tussocks and clusters are scattered widely throughout the associated blue tussockland and cushionfields.

Slim snow tussockland also grows on an alluvial fan at the head of Lake McKay associated with small ponds and complex wetlands, and on alluvial terraces of Roaring Meg and tributaries. Wetter alluvial sites have flush vegetation, grading into extensive wetland areas on peaty valley fills in some Roaring Meg tributaries.

Below 1500-1550 m on sunny faces and about 1350 m on the shadiest, slim snow tussock gives way to narrow-leaved snow tussock, which may be scattered within alpine fescue dominated tussockland, or in historically favoured sites, remain as dense snow tussockland.

Narrow-leaved snow tussockland is extensive on the eastern face below the cirques, thinning out to fescue tussockland below, with further modification by oversowing and topdressing near the lower boundary of the priority area. Matagouri shrubland is associated with watercourses and rock outcrops below about 900 m in this area.

Dracophyllum pronum shrubland is a distinctive community characteristic of many shady faces between 1300 m and 1600 m on the Pisa Range, found at a few sites on the eastern, northern and western periphery of the area but more extensively developed further north and south.

#### FLORA

The area includes the largest known population of Poa pygmaea, a rare and distinctive dwarf grass confined to the high alpine zone of the Pisa Range and a few localities on the Dunstan Mountains and Mount Cardrona. The rare herb Chionohebe myosotioides has its type locality here. Another rare species Epilobium purpuratum was not found during the survey, but has been reported to be present (Mark and Bliss, 1969). Other uncommon species in the very diverse alpine flora are Aciphylla simplex, Anisotome pilifera, Raoulia youngii, Poa kirkii and P. novae-zelandiae.

#### DISCUSSION

This priority area is of outstanding representative significance. The Pisa Range is the highest of the fault block mountains characteristic of the Central Otago region, and one of the most distinctive landform and ecological systems of New Zealand. It includes a remarkable summit landscape of broad gently undulating ridges, dramatically contrasting with the glacial cirques and steep slumped slopes of the eastern fault scarp face falling 1700 m to the Clutha valley floor.

The priority area is a partial transect across the district, biased towards the higher altitudes, and including extensive representation of the Meg and Lowburn land systems.

A large area is necessary to include the full range of landforms, including the steep valleys entrenched into the southwestern edge of the summit plateau and the sequence of high alpine valleys showing the south to north transition from non-glacial to fully glacial form.

A very wide range of vegetation types is represented, closely dependent on large and small scale variation of the landform in addition to factors such as altitude, wind exposure, aspect, snow lie, drainage and historic factors. Judging from the nature of the existing snow tussockland patches, it is clear that snow tussockland is now less extensive than originally, and that much of the short alpine tussockland and cushionfield was induced by early pastoral practices.

Black-backed gull, South Island pied oystercatcher, banded dotterel, black-fronted tern and grey duck all breed within the priority area, using the open ridges and valley sides, wetlands, gentle streams, tors and other rock outcrops of the summit plateau. Although the numbers of these birds are seemingly not great, their high altitude breeding is a very distinctive and special feature of great interest.



The priority area gives includes representation of the larger and smaller cirques with their complex vegetation communities and the mid altitude ripply slumped slopes characteristic of the Lowburn land system. Snow tussockland of good quality is extensive on these slopes within the priority area but strongly modified to the north and south. The lower eastern boundary at the existing fenceline extends the priority area into oversown fescue tussockland of low naturalness.

The northern boundary is placed to include the paired catchments of two branches of the Fall Burn (of similar size and northerly aspect, but one of glacial form and the other not) while excluding the more modified mid altitude slopes almost devoid of snow tussock and with a high concentration of golden spaniard. A small area in the northwest includes the ecological pattern on Manuherikia Group sediments. The boundary in the west generally follows the catchment boundary of Roaring Meg. The relatively low naturalness of the entire Criffel land system precludes extending the priority transect further west across the Pisa district.

The deeply entrenched mid-reaches of the Colour Burn and Winter Creek shelter dense snow tussockland which has been buffered from the modification centred on Meg Hut by bluffs, waterfalls and gorges below their confluence. The boundary in the southwest corner of the priority area is placed to include this natural buffer. The remainder of the southern boundary follows catchment boundaries and existing fencelines.

#### CRITERIA SUMMARY

Representativeness	- H -	Includes all high alpine communities, significant amount of low alpine communities, descending to montane zone in the east.
Diversity	- H -	A very large range of communities.
Naturalness	- H -	Generally high throughout area except near lower eastern boundary, although some cushionfield and alpine short tussockland have probably been fire-induced.
Special Features	- H -	Several rare and locally endemic species, complex vegetation patterns in cirque basins, highest altitude in Central Otago region, alpine breeding of several bird species.
Viability	- H -	Extensive reasonably stable vegetation communities.
Buffering	- H -	Large area, buffered by similar vegetation to that within area on all high altitude boundaries.
Threat	- M -	Localised stock impacts especially in alpine wetlands and flushes, off-road vehicles in fragile cushionfields.
Landform	- H -	Very wide range of distinctive landforms, thorough representation of summit plateau and eastern fault-scarp face.



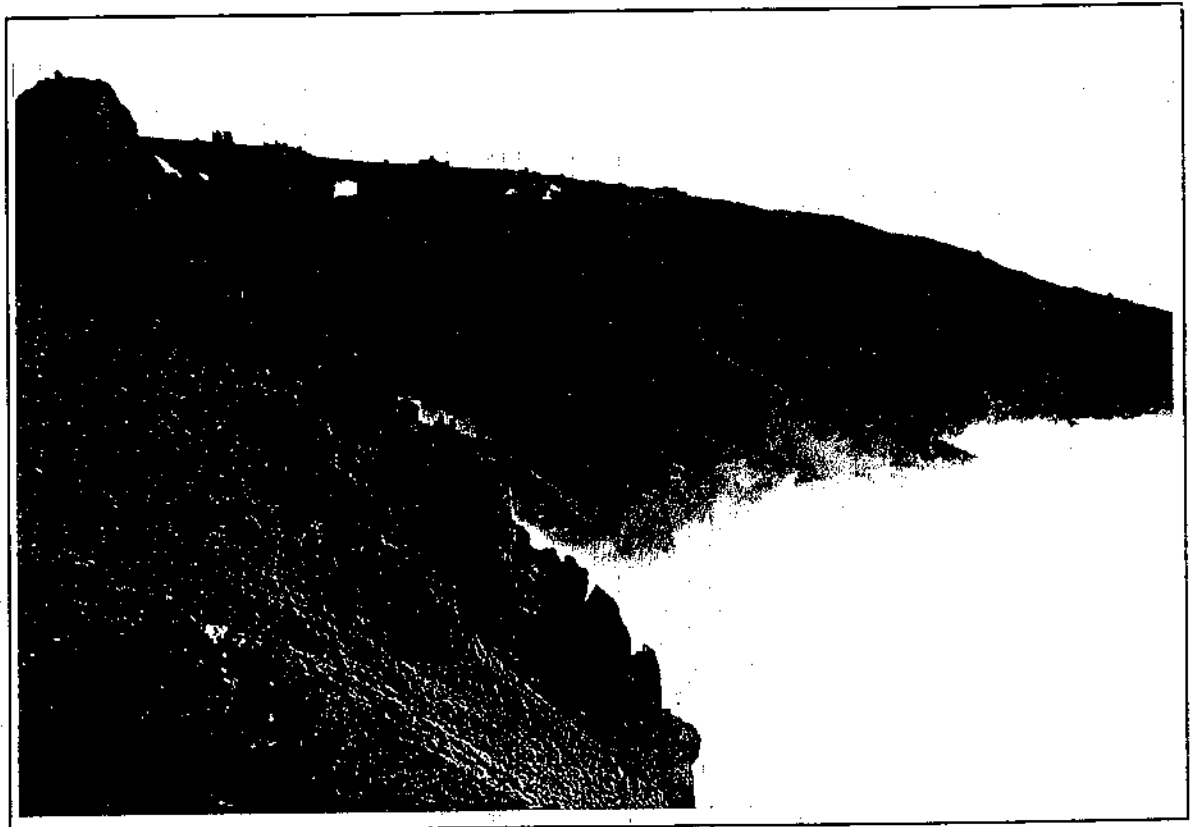
Cardrona - Lowburn Pack Track.



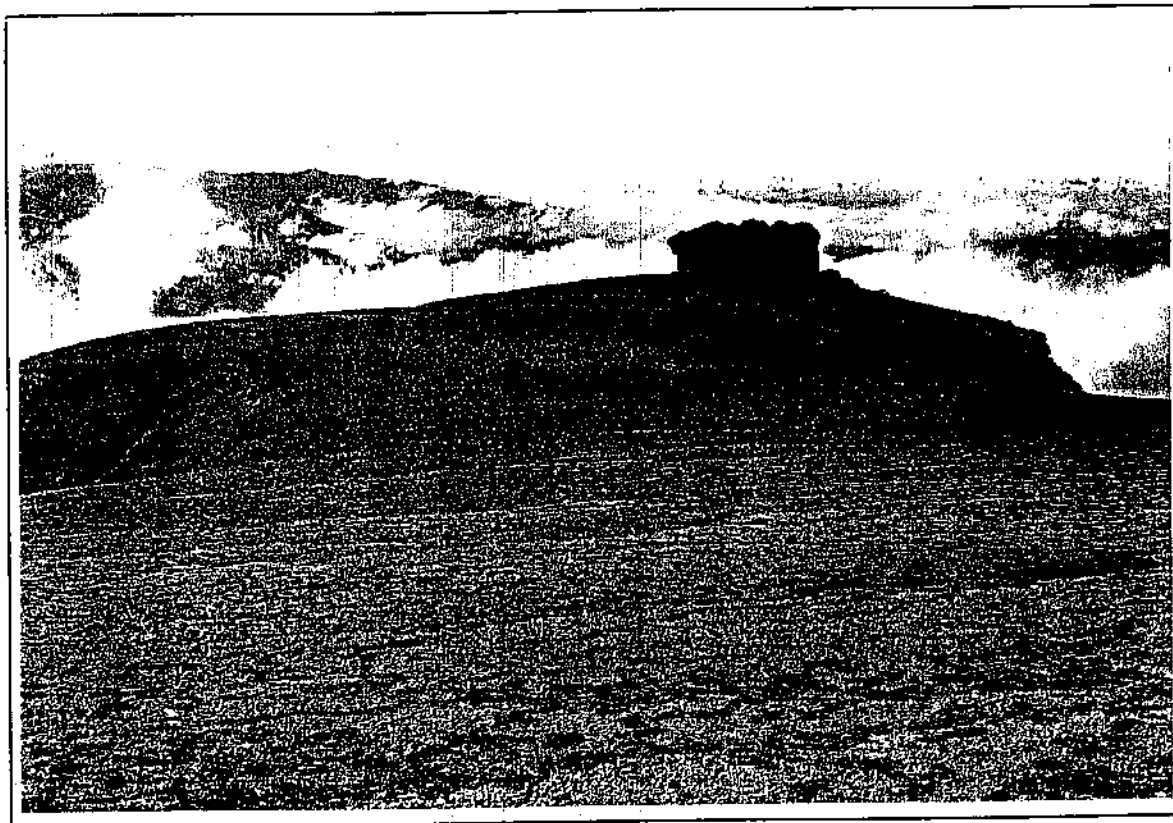
Upper Amisfield Burn catchment.



From Cardrona - Lowburn Pack Track.



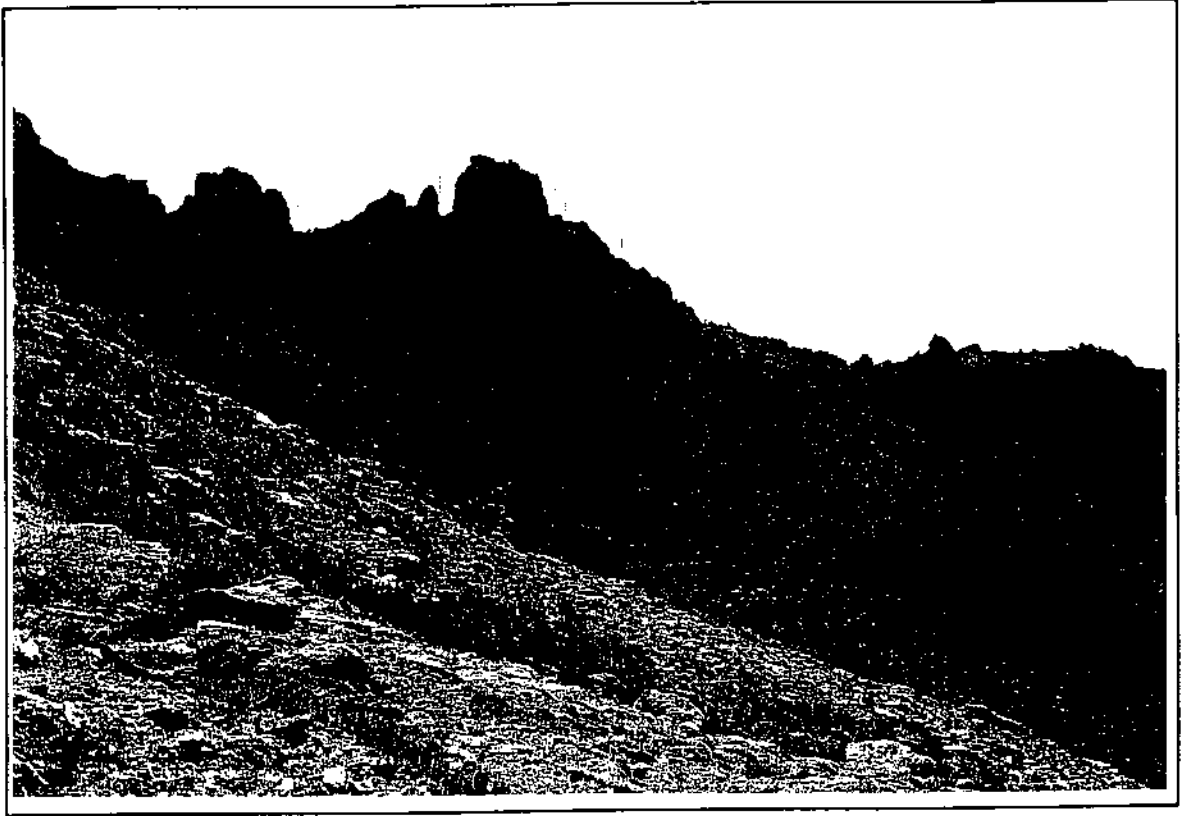
Gordon Rocks



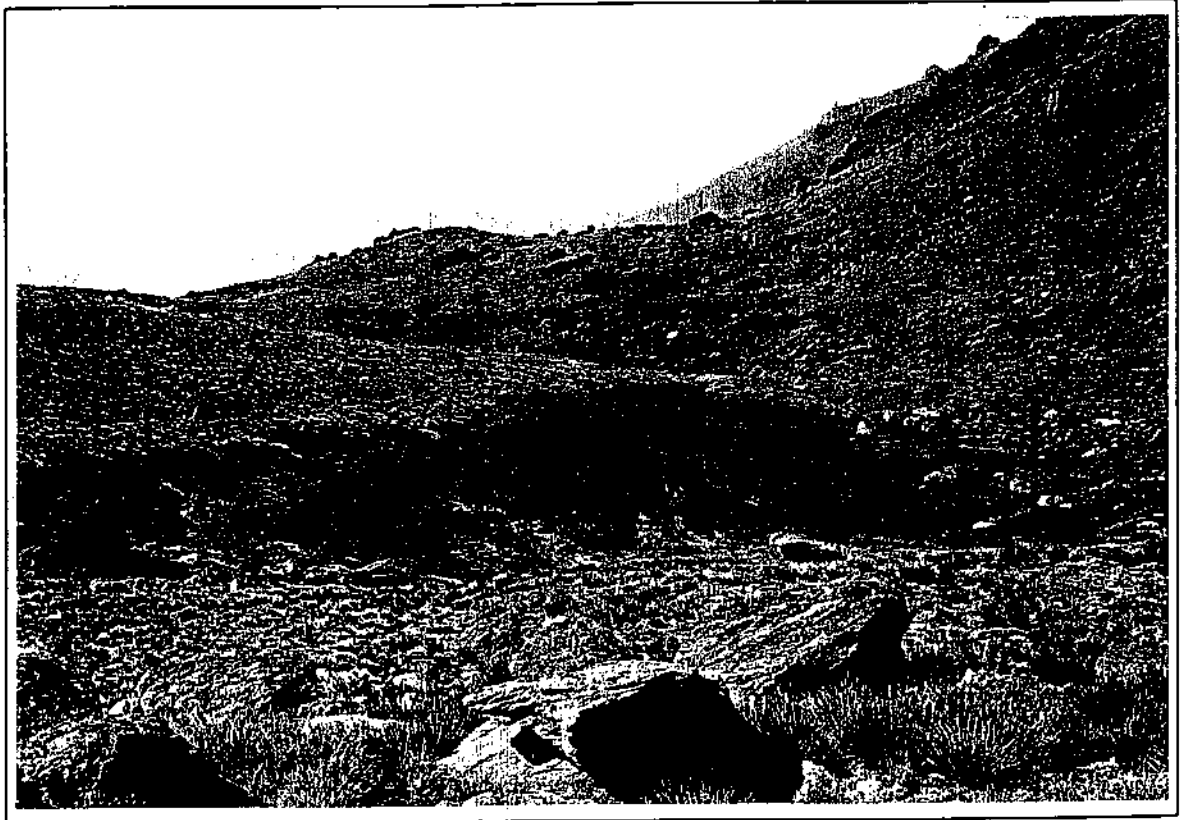
Pisa Range crest.



Pisa Range crest southern end.



Park Burn ridge.



Wetland Upper Park Burn catchment.