TIMARU DISTRICT

SIGNIFICANT NATURAL AREAS SURVEY

BLACK PARTNERSHIP
PAREORA DOWNS

Report prepared for Timaru District Council by Mike Harding
August 2012

TIMARU DISTRICT SIGNIFICANT NATURAL AREAS SURVEY

PROPERTY REPORT

PROPERTY DETAILS:

Owner: ..... Grant Black (Black Partnership)
Valuation References: 24850/010.00
Address: ..... Pareora Ford Road
Location:..... On hill country between Cave Hill, Limestone valley, Taiko valley and the Pareora River.
Ecological District:..... Waimate Ecological District.
TDC Land Type:..... 'Soft Rock Hills and Downs' to the east and 'Hard Rock Hills and Downs' to the west.
Land Environment: ..... N3 (eastern South Island undulating plains and hills).

ECOLOGICAL CONTEXT:

The property covers moderately-steep slopes of the hill country west of Taiko valley. It spans the boundary between limestone in the east, marine sediments in the middle, and greywacke/argillite in the west. The property lies in Waimate Ecological District.

It is likely that the original vegetation of this area was predominantly podocarp-hardwood forest, dominated by matai and totara. Shrubland, treeland and tussockland may have occupied areas that were prone to infrequent natural fires. Limestone bluffs supported specialised flora, and riparian areas supported wetland vegetation and mixed hardwood forest dominated by kowhai.

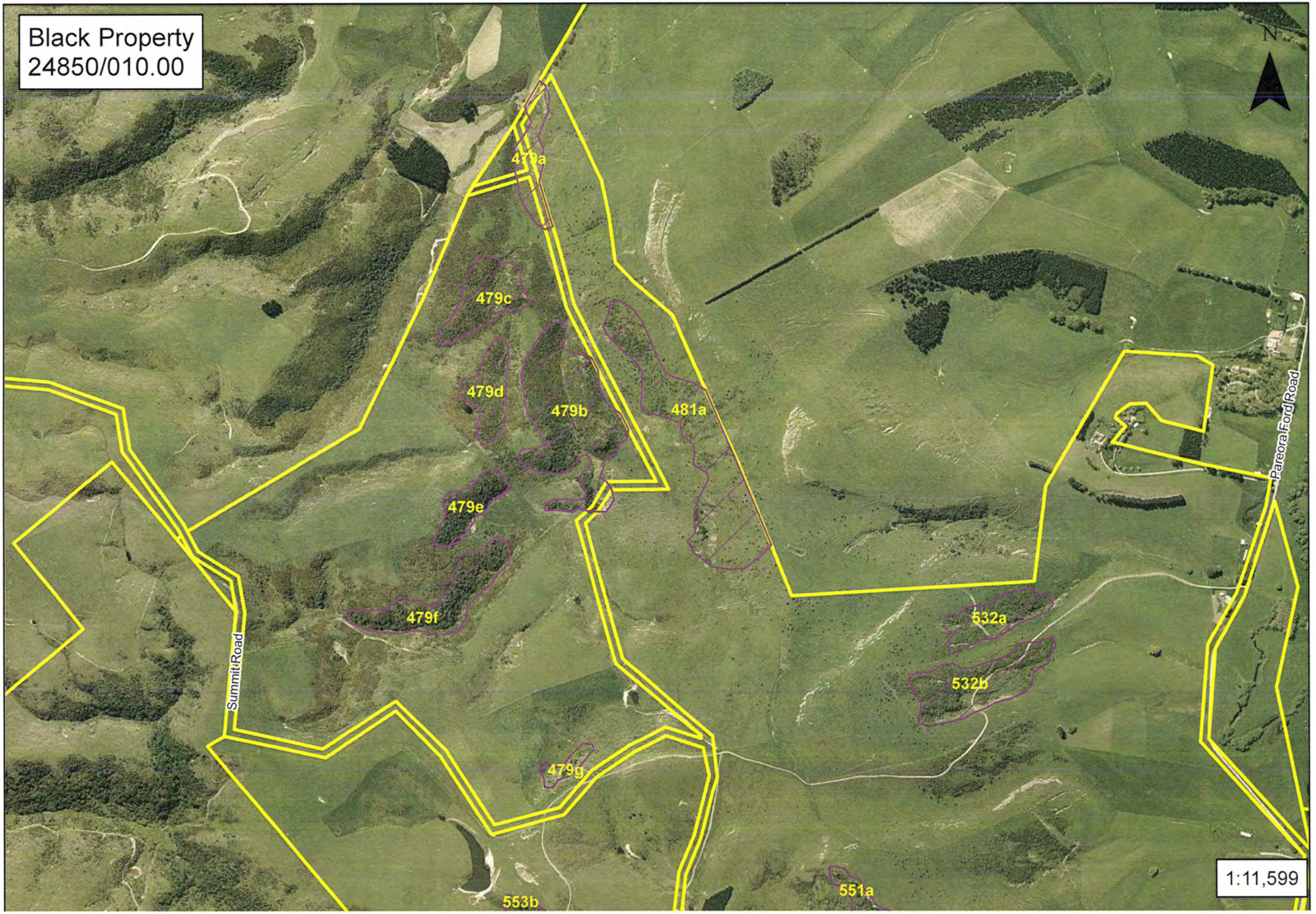
Today the original forest cover of Waimate Ecological District, within Timaru District, is largely confined to remnants in gullies on Cave Hill and Mt Horrible (including Claremont Scenic Reserve), and on basalt and limestone slopes in the Taiko and Limestone valleys. Otherwise, the indigenous vegetation of the ecological district is substantially depleted or modified.

The indigenous fauna would have originally been significantly more numerous and diverse, with a greater range of birds, lizards and invertebrates than is presently found in the area.

SIGNIFICANT AREAS ON THE PROPERTY:

Indigenous vegetation on the property comprises hardwood forest, shrubland/scrub, sparse rockland vegetation on and below limestone scarps, and sedgeland/rushland (wetland) on stream terraces and in gullies. The property lies adjacent to areas of forest and shrubland on adjoining properties, contributing to the network of fauna habitat in the wider area.

The property was surveyed as part of the District-wide survey of Significant Natural Areas during March 2011. Most parts of the property were surveyed. Twelve areas, comprising approximately 120 hectares, are regarded as Significant Natural Areas (SNAs) when assessed against the District Plan criteria. These SNAs are listed in the table below.


Black Property
24850/010.00
N
479a
479c
479d
479b
481a
479e
479f
532a
532b
479g
553b
551a
Summit Road
Pareora Ford Road
1:11,599


Black Property
24850/010.00
479g
Summit Road
551a
553b
N
Pareora Ford Road
1:14,499

TIMARU DISTRICT SNA SURVEY

SNA 479a

Area Name:
Location (central map reference): J39: 528-482
Ecological District: Waimate
Surveyors: Mike Harding

Property: Black
Nearest Locality: Taiko Flat
Area Size (ha): 1.96 **Altitude (m):** 180-200
Survey Time: 1 hour **Survey Date:** 17-03-11

General Description:

This SNA lies on the valley floor at the northernmost part of the property. It occupies a poorly drained river terrace that extends onto the adjoining property. It lies close to other areas of indigenous vegetation.

Plant Communities:

Sedgeland is the main plant community present, described below. Naturalized (exotic) species are indicated with an asterisk*.

This sedgeland (wetland) is dominated by tall *Carex secta*. Other canopy species present are *Juncus gregiflorus*, mostly at the margins, scattered *Coprosma propinqua* and pohuehue.

The ground-cover vegetation in the wetland is dominated by white clover*, creeping buttercup*, pennywort and Yorkshire fog*. Other plant species present are *Carex coriacea*, Californian thistle*, stitchwort*, musk*, broad-leaved dock*, watercress*, water forget-me-not*, foxglove*, *Blechnum penna-marina* and cocksfoot*.

Additional species present at the margins are cabbage tree, matagouri and gorse*.

Birds/Fauna Observed:

The only native bird observed during this brief survey was grey warbler.

Notable Flora, Fauna and Habitats:

Important features of this area are the size, health and dominance of *Carex secta*, the extent of the wetland and that lowland wetlands are a nationally-rare ecosystem.

Notable Plant and Animal Pests:

Gorse is the only woody plant pest present. Unusually, no crack willow is present in the wetland or in the catchment above the wetland. Inter-sedge spaces are dominated by naturalized herbs and grasses, as is typical for most wetlands in the district. Animal pests were not surveyed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):

The wetland is bounded by the edge of the stream terrace, though is grazed as part of a larger paddock. It adjoins SNA 479b at its upper end and lies close to other areas of indigenous vegetation, including SNA 479c and SNA 481a.

Condition and Management Issues:

The dominant plant species at the wetland, *Carex secta*, is in very good condition. Individual sedges are two metres tall and close together. The inter-sedge vegetation is dominated by naturalized plants and damaged by cattle grazing and pugging. Old drainage ditches are present at each side of the wetland and, although shallow, they have presumably lowered the ground-water level in the wetland.

Property Owner Comment:

Mr Black would like to develop the drier parts of the valley floor, though intends to protect the areas of wetland.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	**M**	The canopy cover is representative of wetland vegetation of the ecological district, though the inter-sedge flora is dominated by exotic species.
Rarity	**M/H**	Lowland wetlands are a nationally-rare ecosystem.
Diversity and pattern	**L/M**	Indigenous species diversity is relatively low.
Distinctiveness/special features	**M**	The stature and health of the *Carex secta* are notable features.
Other Criteria		
Size/shape	**H**	Large for a wetland, especially at low altitude in Timaru District.
Connectivity	**M/H**	Adjoins and is partly buffered by other areas of indigenous vegetation.
Long-term Sustainability	**M**	The wetland is threatened by cattle grazing and vulnerable to weed invasion (notably gorse).

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
This wetland lies at the very edge of the property and is not presently traversed by farm tracks. It has potential for farm development, though would need to be drained. Wetlands are now nationally rare. This is a very good example of a *Carex secta* sedgeland and is one of the largest in this part of Timaru District.

Discussion:
This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the size, health and dominance of *Carex secta*, the extent of the wetland and that lowland wetlands are a nationally-rare ecosystem.

Sedgeland (wetland) at SNA 479a

TIMARU DISTRICT SNA SURVEY Wetland 479a
Wetland Record Form

Wetland name:	**Date:** 17 March 2011
Property: Grant Black	**GPS/Grid Ref:** NZMS260 J39: 528-842
Altitude: 180 to 200m	**No. of plots sampled:**
Location: Limestone valley, Waimate ED	**Approximate size (ha):**

Classification: I System	IA Subsystem	II Wetland Class	IIA Wetland Form
Palustrine		Marsh	Flat

Surveyors:

Indicator	Indicator components	Specify and Comment	Score 0-5[1]	Mean score
Change in hydrological integrity	Impact of manmade structures	none present	5	4.33
	Water table depth		4	
	Dryland plant invasion	pasture grasses at edges	4	
Change in physico-chemical parameters	Fire damage	no evidence	5	4
	Degree of sedimentation/erosion	none obvious	4	
	Nutrient levels	cattle	3	
	von Post index			
Change in ecosystem intactness	Loss in area of original wetland	former drainage at edges	3	3
	Connectivity barriers	some modification upstream	3	
Change in browsing, predation and harvesting regimes	Damage by domestic or feral animals	cattle browsing/pugging	3	4
	Introduced predator impacts on wildlife	not known		
	Harvesting levels	none apparent6	5	
Change in dominance of native plants	Introduced plant canopy cover	low	5	3.5
	Introduced plant understorey cover	high	2	
Total wetland condition index /25				**18.83**

Main vegetation types: *Carex secta* sedgeland; *Juncus gregiflorus* rsuhland

Native fauna: grey warbler

Other comments:

Pressure	Rating[2]	Specify and Comment
Modifications to catchment hydrology	1	small dam constructed upstream
Water quality within the catchment	1	good
Animal access	3	readily accessible to stock
Key undesirable species	1	gorse and broom
% catchment in introduced vegetation	3	50-75%
Other pressures	3	farm development
Total wetland pressure index /30		

Source: Clarkson *et al*, Handbook for monitoring wetland condition, Ministry for the Environment, August 2002.

[1] Assign degree of modification thus: 5=v. low/ none, 4=low, 3=medium, 2=high, 1=v. high, 0=extreme

[2] Assign pressure scores as follows: 5=very high, 4=high, 3=medium, 2=low, 1=very low, 0=none

TIMARU DISTRICT SNA SURVEY SNA 479b-f

Area Name:
Property: Black
Ecological District: Waimate
Nearest Locality: Taiko Flat
AREA 479b: Location (central map ref.): J39: 529-475 **Area Size (ha):** 7.65 **Altitude (m):** 210-300
AREA 479c: Location (central map ref.): J39: 528-480 **Area Size (ha):** 2.62 **Altitude (m):** 220-240
AREA 479d: Location (central map ref.): J39: 527-477 **Area Size (ha):** 1.92 **Altitude (m):** 260-320
AREA 479e: Location (central map ref.): J39: 527-475 **Area Size (ha):** 1.66 **Altitude (m):** 280-330
AREA 479f: Location (central map ref.): J39: 525-472 **Area Size (ha):** 3.61 **Altitude (m):** 300-380
Surveyors: Mike Harding **Survey Time:** 2½ hours **Survey Date:** 17-03-11

General Description:

These five SNAs lie on steep to moderately-steep slopes in a north-trending valley at the northern part of the property. All support remnant and regenerating forest with scrub or shrubland at their margins. They are connected to one another by extensive areas of gorse scrub and/or scattered native shrubs. These SNAs are described together here as they support similar plant communities.

Plant Communities:

Two main plant communities are present: forest and shrubland/scrub. These plant communities are described for each SNA below. Naturalized (exotic) species are indicated with an asterisk*.

SNA 479b:

This SNA supports areas of forest at the western part and scrub on rocky slopes at the eastern part. Scrub communities are dominated by *Coprosma propinqua*. Other important species present are broom*, gorse*, *Coprosma tayloriae*, *Coprosma crassifolia*, matagouri, pohuehue, leafless lawyer, native convolvulus and emergent trees of matipo, broadleaf, mahoe and cabbage tree.

Other species present in the scrub/shrubland and at rocky sites on the forest margin are native broom, scrub pohuehue, lawyer, native jasmine, *Einadia allanii*, horehound*, yarrow*, sand spurrey*, woolly mullein*, *Dichondra repens*, *Oxalis exilis*, necklace fern, *Rytidosperma* sp., blue wheat grass, plume grass and cocksfoot*. The size of the *Coprosma crassifolia* bushes at the forest margin and the abundance of *Einadia allanii* at rocky sites are notable.

Forest in this SNA was not surveyed closely; instead it was viewed from the exterior. The forest canopy is dominated by broadleaf and kowhai. Other canopy species present are cabbage tree, matipo, five-finger and mahoe. The forest interior is probably similar to that described for SNA 479f.

SNA 479c:

This small area of forest occupies rocky slopes at the lower end of a small tributary gully. It adjoins extensive areas of scrub, mostly dominated by gorse*. The forest patch is dominated by broadleaf. Other canopy species are cabbage tree, lancewood, mapou, five-finger and mahoe.

Scrub at the forest margin is dominated by *Coprosma propinqua*, *Coprosma crassifolia*, broom* and lawyer. Other canopy species present are matagouri, native broom, *Coprosma rubra*, gorse*, scrub pohuehue, pohuehue, native convolvulus, native jasmine, *Clematis marata* and emergent lancewood and cabbage trees. Understorey or ground-cover species are bracken, silver tussock, common shield fern, *Pellaea rotundifolia*, necklace fern, *Asplenium hookerianum*, toatoa, hairy pennywort, *Hydrocotyle heteromeria*, *Oxalis exilis*, black nightshade*, hawksbeard*, blue wheat grass and blue tussock. Additional species present in the gully are fuchsia and hybrid fuchsia.

SNA 479d:

This small area of forest lies on moderately-steep east-facing slopes. It is surrounded by scrub, mostly dominated by gorse*, and was only viewed from a distance. It is dominated by broadleaf, cabbage tree,

mapou, matipo, mahoe, five-finger, *Coprosma propinqua* and *Coprosma crassifolia*. A few kowhai trees are present.

SNA 479e:

This SNA lies on steep southeast-facing slopes. It comprises forest with shrubland at its margins. Important forest canopy species are cabbage tree, mahoe, kowhai, matipo, lancewood, marbleleaf, mapou and bush lawyer. Shrubland canopy species are *Coprosma propinqua*, *Coprosma tayloriae*, *Coprosma crassifolia*, matagouri, gorse*, koromiko, mistletoe (on *Coprosma propinqua* and *Coprosma tayloriae*), bush lawyer and native convolvulus.

Other species present are browntop*, *Rytidosperma* sp., plume grass, shepherd's purse*, *Dichondra repens*, black nightshade*, common shield fern, necklace fern, *Asplenium hookerianum*, *Asplenium richardii*, suckling clover*, woolly mullein*, toatoa, *Einadia allanii*, hairy pennywort, bracken and hybrid fuchsia.

SNA 479f:

This more extensive area of forest occupies south-facing slopes of a gully. It is dominated by broadleaf, mahoe and cabbage tree. Other forest canopy species present are lancewood, matipo, kowhai, marbleleaf, five-finger, mapou, bush lawyer and pohuehue. Ground-cover species are male fern*, *Blechnum fluviatile*, pennywort, and seedlings of mahoe and *Coprosma* species.

Areas of shrubland/scrub amongst and adjacent to the forest are dominated by *Coprosma propinqua* and *Coprosma crassifolia*. Additional species present at the forest/shrubland margin are rohutu, matagouri, *Coprosma tayloriae*, gorse*, poroporo, *Helichrysum lanceolatum*, scrambling fuchsia, bracken and leafless lawyer. Ground-cover species in these open areas are browntop*, *Rytidosperma* sp., sweet vernal*, cocksfoot*, Yorkshire fog*, catsear*, white clover*, mouse-ear hawkweed*, narrow-leaved plantain*, moss, burdock*, Californian thistle*, hairy pennywort, common shield fern, necklace fern, *Stellaria parviflora* agg. and foxglove*. Additional species in the gully are *Carex secta*, *Carex coriacea*, *Hypolepis ambigua* and bush lily.

Birds/Fauna Observed:
Native birds observed during this survey were grey warbler, bellbird, fantail, harrier and silvereye. Parts of the area appear to provide good lizard habitat, though no lizards were observed.

Notable Flora, Fauna and Habitats:
Important features of this area are the extent of forest and shrubland, the diversity of plant species present, the presence of an at-risk (naturally uncommon) plant species (*Einadia allani*) and a locally-uncommon plant species (*Coprosma rubra*) and the extent of habitat the areas provide for forest birds.

Notable Plant and Animal Pests:
Gorse and broom are the most important plant pests present. However, these species do not pose a significant threat to the taller woody vegetation and gorse provides a favourable environment for the regeneration of native species. A number of other agricultural weeds are present. Animal pests were not surveyed, though one wallaby was seen in SNA 479c and possum sign was observed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):
These SNAs are protected by their locations on steeper mostly rocky slopes. They are buffered and connected by areas of mostly gorse-dominated scrub. All the areas are grazed as part of larger paddocks, though grazing pressure does not appear high. Other areas of indigenous vegetation are present nearby.

Condition and Management Issues:
The core areas of forest are in relatively good condition. Areas of shrubland and scrub are affected to various degrees by gorse and broom, though taller native species are successfully regenerating in these areas. If left to regenerate, these SNAs would eventually become one large area of indigenous forest and shrubland. The most important management issues are control of animal pests (especially wallabies), protection from intensive grazing and encouragement of regeneration at the SNA margins.

Property Owner Comment:
Mr Black intends to clear the denser areas of gorse, though proposes to protect (leave undisturbed) areas of native vegetation.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	**M**	Good examples of regenerating forest, typical of that remaining in the ecological district.
Rarity	**M**	Supports an at-risk plant species (*Einadia allani*) and one locally-uncommon plant species, *Coprosma rubra*.
Diversity and pattern	**M**	A diverse range of plant species is present.
Distinctiveness/special features	**M**	The abundance of rockland plant species is a notable feature.
Other Criteria		
Size/shape	**M/H**	Small to moderate-sized areas that have good shapes and are very well buffered.
Connectivity	**M/H**	These areas are connected by scrub and shrubland and collectively provide a large area of forest bird habitat.
Long-term Sustainability	**M/H**	Some animal pest control will probably be necessary to maintain ecological values in the long term.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
These areas occupy the steeper rocky sites on this part of the property. The core areas (SNAs) have limited potential for farm development. Intervening areas of scrub provide valuable linkages between the SNAs and, if left to regenerate, will eventually allow establishment of a relatively large area of forest.

Discussion:
These areas meet the District Plan criteria for Significant Natural Areas. Important features of the areas are the extent of the forest and shrubland, the diversity of plant species present, the presence of an at-risk plant species (*Einadia allani*) and a locally-uncommon plant species (*Coprosma rubra*) and the extent of habitat the areas provide for forest birds.

SNA 479b from the saddle adjacent to SNA 479c

TIMARU DISTRICT SNA SURVEY

SNA 479g

Area Name:
Location (central map reference): J39: 530-468
Ecological District: Waimate
Surveyors: Mike Harding

Property: Black
Nearest Locality: Taiko Flat
Area Size (ha): 0.58 **Altitude (m):** 300-330
Survey Time: ½ hour **Survey Date:** 17-03-11

General Description:

This SNA lies on a small rock bluff and adjacent boulder slope. The lower boundary includes a small stand of scrub and a sedgeland in the gully bottom.

Plant Communities:

Three main plant communities are present: forest on rock; shrubland and sedgeland. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Forest on rock:

The small area of forest on the talus slope below the bluff is dominated by broadleaf. Other canopy species are mahoe, cabbage tree, lancewood, native jasmine and pohuehue. The forest has a very open understorey and the ground-cover comprises large slabs of rock.

Species present at the forest margin (mostly on rock) are *Coprosma tayloriae*, porcupine shrub, velvety nightshade*, woolly mullein*, mouse-ear hawkweed*, plume grass, blue wheat grass, silver tussock, *Rytidosperma* sp., bracken, necklace fern, *Pellaea rotundifolia*, *Oxalis exilis* and *Carex breviculmis*.

The small patch of shrubland is dominated by *Coprosma crassifolia*. Other species present here are matipo, broadleaf, kowhai, matagouri, *Coprosma propinqua*, native convolvulus, leafless lawyer, lawyer, mistletoe, nettle*, horehound*, black nightshade*, *Dichondra repens* and *Einadia allanii*.

The sedgeland (wetland) in the gully bottom is dominated by *Carex coriacea*, *Carex secta*, *Juncus gregiflorus* and silver tussock.

Birds/Fauna Observed:

Native birds observed during this brief survey were grey warbler and fantail. A number of skinks (common or McCanns) were observed.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of indigenous forest on rock talus, the diversity of habitats at the site, the presence of an at-risk (naturally uncommon) plant species (*Einadia allani*) and the presence of good lizard habitat.

Notable Plant and Animal Pests:

No significant plant pests are present. Animal pests were not surveyed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):

This area is buffered by its location on a rocky slope and sheltered gully. It lies within a larger paddock and is close to more extensive areas of indigenous forest, scrub and wetland.

Condition and Management Issues:

Canopy vegetation within this SNA is in relatively good condition; the forest understorey is depleted. The main management issues are control of any invasive plant pests and protection from intensive grazing.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	Indigenous vegetation that is representative of forest and shrubland on rocky substrates.
Rarity	M	Supports an at-risk plant species (*Einadia allani*).
Diversity and pattern	M	Rockland forest, shrubland and wetland plant communities are present.
Distinctiveness/special features	M	The area provides good habitat for lizards.
Other Criteria		
Size/shape	M	A small area but with a reasonable shape and well buffered.
Connectivity	M	Lies close to other areas of indigenous vegetation.
Long-term Sustainability	M/H	Vegetation on the rocky substrate is well protected. Other parts of the SNA are more vulnerable.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
Most parts of this area have very limited potential for farm development.

Discussion:
This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of indigenous forest on rock talus, the diversity of habitats at the site, the presence of an at-risk (naturally uncommon) plant species (*Einadia allani*) and good lizard habitat.

SNA 479g

TIMARU DISTRICT SNA SURVEY SNA 481a

Area Name:
Location (central map reference): J39: 532-477
Ecological District: Waimate
Surveyors: Mike Harding

Property: Black
Nearest Locality: Taiko Flat
Area Size (ha): 8.11 **Altitude (m):** 240-270
Survey Time: 1 hour **Survey Date:** 17-03-11

General Description:

This SNA lies on moderately steep west-facing slopes of the main gully at the northern part of the property. It is close to other areas of indigenous vegetation (SNA 479).

Plant Communities:

Shrubland/scrub, cabbage treeland and rushland are the main plant communities are present. These plant communities are described separately below, though they inter-grade with one another. Naturalized (exotic) species are indicated with an asterisk*.

Shrubland/scrub:

This is the most extensive plant community at the SNA. It ranges from sparse shrubland at the southern (up-valley) end of the SNA to denser shrubland/scrub at the northern (down-valley) end of the SNA.

It is dominated by *Coprosma propinqua* and matagouri. Other canopy species present are *Coprosma crassifolia*, native broom, pohuehue, mistletoe (on *Coprosma propinqua*) and occasionally mountain akeake and gorse*. Cabbage trees are scattered throughout this plant community. Additional species present in the small erosion gully at the south end of this area are broadleaf, *Helichrysum lanceolatum*, mapou and elderberry*.

The ground-cover throughout this plant community is dominated by pasture grasses. Indigenous grasses present are *Rytidosperma* sp., *Elymus* sp. and silver tussock.

Rushland:

This plant community is scattered throughout the SNA, though is denser at seepages in the small gullies. It is dominated by *Juncus gregiflorus*. Also present are *Juncus australis*, *Juncus distegus*, silver tussock and, at damper sites, *Carex secta* and *Carex coriacea*. Otherwise, the area supports pasture grasses and shrubland, as described above.

Cabbage treeland:

This plant community is present throughout the area and especially on the upper slopes. It comprises scattered cabbage trees emergent from the shrubland, rushland and pasture described above. Trunk diameters (at breast height) of the larger cabbage trees range from 45 to 85cm.

Birds/Fauna Observed:

Native birds observed during this brief survey were grey warbler, silvereye and fantail.

Notable Flora, Fauna and Habitats:

Important features of this area are: the location of the area on marine sandstone and mudstone at the contact between limestone and greywacke/argillite; the extent of the wetland vegetation (rushland) and cabbage treeland; and, the size of the area.

Notable Plant and Animal Pests:

Some gorse is present at the margins of the area, though most appears to have been recently sprayed. Animal pests were not surveyed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):
The boundary of this area is poorly defined. It merges with scattered shrubland, patchy rushland and pasture at its boundaries. The area defined here encompasses the denser stands of the three main plant communities. The area is grazed as part of larger paddocks and lies close to other areas of indigenous vegetation.

Condition and Management Issues:
Indigenous plant communities of the SNA are in relatively good condition, though are mostly seral/induced communities that are only partly representative of the former vegetation. These plant communities are likely to persist and perhaps improve under the existing grazing regime. The main management issues are control of woody plant pests (such as gorse and broom) and avoidance of intensive grazing, especially by cattle.

Property Owner Comment:
Mr Black appreciates the value of the scattered cabbage trees.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	A good example of depleted/induced plant communities which are typical of the ecological district.
Rarity	M	The SNA lies adjacent to limestone substrates. Wetland vegetation is nationally rare.
Diversity and pattern	L/M	Low species diversity, though three main plant communities are present.
Distinctiveness/special features	L/M	The location of the area on marine sediments adjacent to limestone is notable.
Other Criteria		
Size/shape	H	A large area for this part of the ecological district.
Connectivity	M	Lies close to other areas of indigenous vegetation.
Long-term Sustainability	M	Control of plant pests and management of grazing will probably be required to maintain ecological values in the long term.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
This area supports seral/induced plant communities that may change over time. The SNA occupies unstable slopes that appear perpetually wet in places. The area has some potential for farm development, though appears too steep and wet for cultivation.

Discussion:
This area only just meets the District Plan criteria for a Significant Natural Area. Important features of the area are: the location of the area on marine sandstone and mudstone at the contact between limestone and greywacke/argillite; the extent of the wetland vegetation (rushland) and cabbage treeland; and the size of the area.

TIMARU DISTRICT SNA SURVEY — SNA 532a & 532b

Area Name:
Ecological District: Waimate
AREA 532a: Location (central map ref.): J39: 540-472
AREA 532b: Location (central map ref.): J39: 539-470
Surveyors: Mike Harding

Property: Black
Nearest Locality: Taiko Flat
Area Size (ha): 2.25 **Altitude (m):** 200-260
Area Size (ha): 4.09 **Altitude (m):** 220-280
Survey Time: 1½ hours **Survey Date:** 08-03-11 and 17-03-11

General Description:

These two SNAs lie on moderately-steep east-facing slopes above the Taiko valley. They lie on and adjacent to areas of exposed limestone near the main farm track on the property. They are described together here as they support similar plant communities.

Plant Communities:

Two main plant communities are present: small patches of low forest and more extensive areas of scrub/shrubland. These plant communities are described for each SNA below. Naturalized (exotic) species are indicated with an asterisk*.

Northern Area (SNA 532a):

Patches of forest within this area (mostly in the small gully) support lancewood, cabbage tree, mountain akeake, mahoe, broadleaf, elderberry* and pohuehue. Other species present within this taller vegetation are hybrid fuchsia, burdock*, black nightshade*, male fern*, common shield fern, *Blechnum chambersii*, *Blechnum fluviatile*, *Blechnum penna-marina*, maidenhair fern, necklace fern, *Asplenium hookerianum*, *Epilobium nummularifolium*, *Hydrocotyle heteromeria*, buttercup, *Senecio dunedinensis*, hawksbeard*, selfheal* and seedlings of mahoe and *Coprosma propinqua*.

The extensive scrub and shrubland that comprise most of this SNA are dominated by *Coprosma propinqua* and matagouri. Other canopy species are native broom, leafless lawyer, lawyer, mistletoe and native convolvulus.

Open areas within the shrubland support pasture dominated by browntop*, sweet vernal*, *Rytidosperma* sp. and white clover. Other species present are bracken, silver tussock, *Elymus* sp., yarrow*, suckling clover*, narrow-leaved plantain*, cocksfoot*, Deptford pink*, woolly mullein*, perennial ryegrass*, dandelion*, purging flax*, nodding thistle*, Californian thistle and *Juncus distegus*.

Southern Area (SNA 532b):

The small patch of forest in this area supports broadleaf, five-finger, cabbage tree, lancewood, mahoe, mountain akeake, elderberry* and pohuehue. Species present within this taller vegetation are necklace fern, *Asplenium lyallii*, *Blechnum chambersii*, burdock*, blue tussock, silver tussock, *Leptinella squalida*, *Hydrocotyle heteromeria*, foxglove*, *Epilobium nummularifolium*, horehound* and seedlings of cabbage tree and *Coprosma propinqua*.

The scrub and shrubland that comprise most of this SNA are dominated by *Coprosma propinqua*, matagouri and mistletoe with emergent cabbage trees. Other canopy species are *Coprosma crassifolia*, native broom, leafless lawyer, lawyer and native jasmine.

Open areas within the shrubland support pasture, similar to that described above for SNA 532a.

Birds/Fauna Observed:

Native birds observed during this brief survey were grey warbler and harrier.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of indigenous vegetation on limestone, the diversity of plant species present and the potential for this site to become more valuable through natural regeneration.

Notable Plant and Animal Pests:
The only woody plant pest observed at these two sites was elderberry, though this does not pose a significant threat. The native climber, pohuehue (*Muehlenbeckia australis*), is present, though not dominant. A number of agricultural weeds are present, such as burdock and nodding thistle, though these do not pose a significant threat to the indigenous woody vegetation. Animal pests were not surveyed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):
These two areas are protected to some extent by the steepness of the slope and the presence of exposed limestone including small gullies. They both lie within a larger paddock and are bisected by a farm track. Areas of shrubland are present in gullies to the south and there are other areas of indigenous vegetation nearby.

Condition and Management Issues:
These SNAs are in relatively good condition. Grazing pressure does not appear to be too high and regeneration of woody species is occurring. The main management issues are control of any new invasive plant pests and avoidance of intensive grazing.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	Indigenous vegetation that is typical of regenerating plant communities in the ecological district.
Rarity	M/H	Indigenous vegetation on limestone is a nationally-rare plant community. Several limestone-obligate species are present.
Diversity and pattern	M	Species diversity is typical of such sites in the area and almost certainly reduced from that formerly present.
Distinctiveness/special features	M	The dominance of mistletoe is a notable feature.
Other Criteria		
Size/shape	M	Both areas are moderate sized and with good shapes, though not well buffered.
Connectivity	M	The areas lie relatively close to other areas of indigenous vegetation and make a useful contribution to the network of fauna habitat in the area.
Long-term Sustainability	M	These areas are vulnerable to intensive grazing.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
These two SNAs are offered some protection by the steepness and rockiness of the slope. These factors limit the potential of these areas for farm development.

Discussion:
These areas meet the District Plan criteria for Significant Natural Areas. Important features of the areas are the presence of indigenous vegetation on limestone, the diversity of plant species present and the potential for the sites to become more valuable through natural regeneration.

TIMARU DISTRICT SNA SURVEY SNA 551a

Area Name:
Location (central map reference): J39: 536-465
Ecological District: Waimate
Surveyors: Mike Harding

Property: Black
Nearest Locality: Taiko Flat
Area Size (ha): 1.02 **Altitude (m):** 300-345
Survey Time: 1 hour **Survey Date:** 17-03-11

General Description:

This SNA lies on and below a prominent limestone scarp within farmland. The scarp lies at the head of a small valley at the southeast part of the property and has a southwest aspect.

Plant Communities:

Two main plant communities are present: forest at the base of the scarp and shrubland/herbfield on or associated with the exposed scarp. . These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Limestone scarp:

Shrubland on and adjacent to the scarp is dominated by *Coprosma propinqua*. Other species present are broadleaf, mountain akeake, native broom, pohuehue, silver tussock, mistletoe (on *Coprosma propinqua*), nodding thistle* and pasture grasses*.

Plant species restricted to or associated with the limestone scarp are broadleaf, *Coprosma propinqua*, mountain akeake, koromiko, *Gingidia enysii* agg., *Oxalis exilis*, *Geranium microphyllum*, *Colobanthus strictus*, *Leptinella squalida*, *Asplenium lyallii*, maidenhair fern, hound's tongue fern, *Einadia allanii*, toatoa, *Stellaria parviflora* agg., *Lagenifera pumila*, *Epilobium nummularifolium*, *Elymus solandri*, blue tussock, *Poa matthewsii*, suckling clover*, narrow-leaved plantain*, hawksbeard* and Deptford pink*.

Forest:

The small patch of forest on the boulder slope below the scarp is dominated by broadleaf and pohuehue. Other canopy species are mahoe, elderberry* and native convolvulus. Species present at forest margins or in forest openings are poroporo and pohuehue. The sparsely vegetated forest floor supports areas of pasture and patches of nettle*, *Parietaria debilis*, daisy* and pennywort.

Birds/Fauna Observed:

The only native bird observed during this brief survey was grey warbler. Welcome swallow and feral pigeon are nesting on the limestone scarp.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of indigenous vegetation on limestone, the extent of the limestone scarp habitat present, and the presence of two at-risk (naturally uncommon) plant species (*Einadia allani* and *Gingidia enysii*), and locally uncommon plant species (*Colobanthus strictus*, *Parietaria debilis*, *Gingidia enysii* and *Lagenifera pumila*).

Notable Plant and Animal Pests:

The native climber, pohuehue (*Muehlenbeckia australis*), is smothering the forest below the scarp. Elderberry is present, though does not pose a significant threat. The scarp itself is relatively free of invasive plant pests. Animal pests were not surveyed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):

This limestone scarp and associated boulder field are surrounded by grazed pasture, though the area lies relatively close to other areas of indigenous forest and shrubland. The plant communities are protected by the steepness of the scarp and the large boulders on the slope below. The site lies within a larger fenced paddock.

Condition and Management Issues:
Plant communities on the limestone scarp are in good condition. The forest on the boulder slope below the bluff is affected by the smothering pohuehue in the canopy and stock grazing in the understorey. The most important management issues are protection of the forest understorey from grazing and control of pohuehue.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous vegetation on limestone bluffs, typical of that present in the ecological district.
Rarity	M/H	Indigenous vegetation on limestone is a nationally-rare plant community. Two at-risk and four locally-uncommon plant species are present.
Diversity and pattern	M	Species diversity on the scarp is typical; species diversity in the forest below the scarp is reduced.
Distinctiveness/special features	M	The height and instability of the scarp are notable features.
Other Criteria		
Size/shape	M	A relatively small area but with a good shape and well buffered.
Connectivity	M	Isolated from other areas of indigenous vegetation, but makes a useful contribution to the network of fauna habitat in the area.
Long-term Sustainability	M/H	Scarp vegetation is well protected; forest below the scarp is threatened by pohuehue and grazing.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
This area is well protected by its location on steep rocky slopes. It has very limited potential for farm development.

Discussion:
This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of indigenous vegetation on limestone, the extent of the limestone scarp habitat, and the presence of two at-risk (naturally uncommon) plant species (*Einadia allani* and *Gingidia enysii*), and four locally uncommon plant species.

TIMARU DISTRICT SNA SURVEY

SNA 553b

Area Name: Irvines Bush
Location (central map reference): J39: 523-455
Ecological District: Waimate
Surveyors: Mike Harding

Property: Black
Nearest Locality: Evans Crossing
Area Size (ha): 83.87 **Altitude (m):** 200-400
Survey Time: 7 hours **Survey Date:** 08-03-11

General Description:

This large SNA occupies a steep-sided valley just east of the summit of Cave Hill. It is the largest area of indigenous forest remaining in this part of Timaru District. The whole valley, including smaller parts of the forested area on adjoining properties, was identified over 30 years ago as a Site of Special Wildlife Interest by the Wildlife Service. There appears to have been considerable forest regeneration since that time, though the area has also been affected by wild animals, notably wallabies. It stretches from the upper slopes of Cave Hill to the Pareora River, over approximately 450m altitude, providing an extensive area of forest bird habitat in an otherwise largely deforested landscape.

Plant Communities:

The main plant communities present are: broadleaf-mahoe forest, kanuka-kowhai forest, and, *Coprosma*-matagouri scrub/shrubland. These plant communities are described separately below, though they frequently grade from one to the other. Naturalized (exotic) species are indicated with an asterisk*.

Broadleaf-mahoe forest:

This forest community occupies mostly steep shady (south-facing) slopes. It is extensive in the upper valley and patchy in the lower valley. The forest canopy is dominated by broadleaf, mahoe, five-finger and mapou. Other canopy species are marbleleaf, lancewood, kowhai, cabbage tree and bush lawyer. Additional canopy species present alongside the main stream are narrow-leaved lacebark, wineberry, lemonwood, pate and fuchsia. A single old matai tree is present beside the stream in the upper valley. This tree has a trunk diameter (at breast height) of 82cm. A single totara tree was observed just upstream on the adjacent property.

The forest understorey is generally quite open. Important understorey species are mapou, *Coprosma crassifolia* and *Coprosma propinqua*. Other understorey species are *Coprosma rhamnoides*, *Helichrysum lanceolatum*, weeping mapou (rare) and lawyer.

Ground-cover species are *Parietaria debilis*, common shield fern, necklace fern, hen and chicken's fern, *Asplenium hookerianum*, *Asplenium appendiculatum*, *Asplenium richardii*, *Pellaea rotundifolia*, hound's tongue fern, *Blechnum procerum*, *Blechnum vulcanicum*, male fern*, buttercup, *Gentiana grisebachii*, hawkbit*, hairy pennywort, star lily, *Cardamine debilis*, hookgrass, *Libertia ixioides*, toatoa, an orchid (*Pterostylis* sp.), moss and seedlings of mahoe, marbleleaf, five-finger, wineberry, koromiko, elderberry*, native jasmine, clematis and *Coprosma* species. Additional ground-cover species present at damper sites are *Blechnum chambersii*, *Blechnum penna-marina*, *Blechnum fluviatile*, prickly shield fern, *Carex forsteri*, pennywort and bush lily.

Additional species present on the forest margin or in forest openings are hybrid fuchsia, poroporo, koromiko, *Coprosma rotundifolia*, *Coprosma propinqua* x *robusta*, pohuehue, thousand-leaved fern, *Hypolepis ambigua*, *Senecio dunedinensis*, *Hydrocotyle heteromeria* and foxglove*.

Kanuka-kowhai forest:

This community occupies drier (generally north- or east-facing) slopes, mostly in the mid to lower valley. It is dominated by kanuka and kowhai. Other canopy species are marbleleaf, broadleaf, lancewood, matipo, mapou, five-finger, lemonwood, cabbage tree, bush lawyer, lawyer and pohuehue.

The forest understorey is dominated by *Coprosma crassifolia* and korokio. Other understorey species are *Coprosma rhamnoides*, poataniwha, lancewood, rohutu, native jasmine, native convolvulus, lawyer, bush lawyer and, on tree trunks, hound's tongue fern and hanging spleenwort.

Ground-cover species are toatoa, *Parietaria debilis*, necklace fern, hen and chickens fern, hanging spleenwort, *Asplenium appendiculatum*, *Asplenium richardii*, common shield fern, *Pellaea rotundifolia*, hound's tongue fern, hairy pennywort, *Dichondra repens*, hawksbeard* and seedlings of mahoe, kowhai, mapou, narrow-leaved lacebark, clematis and native jasmine.

Additional species present in forest openings are *Coprosma tayloriae*, *Coprosma rigida*, *Coprosma propinqua*, matagouri, native broom, mountain akeake, poroporo, elderberry*, pohuehue, native convolvulus, leafless lawyer, dwarf mistletoe (on *Coprosma crassifolia*), mistletoe (on *Coprosma propinqua* and *Coprosma crassifolia*), *Hypolepis ambigua*, bracken, foxglove*, Californian thistle*, nodding thistle*, burdock*, black nightshade*, velvety nightshade*, bittersweet*, woolly mullein*, *Gentiana grisebachii*, *Hydrocotyle heteromeria*, *Helichrysum filicaule*, *Wahlenbergia gracilis*, *Einadia allanii*, *Epilobium pubens*, *Euchiton audax*, *Galium propinquum*, mouse-ear hawkweed*, plume grass, *Echinopogon ovatus*, *Rytidosperma clavatum* and silver tussock.

There are smaller areas of kanuka-kowhai forest on lower west-facing slopes. The forest understorey at these damper sites is dominated by *Coprosma rhamnoides* and *Helichrysum lanceolatum*. Additional plant species present are fuchsia, *Juncus gregiflorus*, soft rush*, *Libertia ixioides*, *Blechnum procerum*, *Blechnum vulcanicum*, *Epilobium nummularifolium*, bidibid and selfheal*.

<u>*Coprosma*-matagouri scrub/shrubland</u>:

This plant community covers substantial areas on west-facing slopes at the edge of the SNA and smaller areas between forest patches on east-facing mid-valley slopes. It is dominated by *Coprosma propinqua*, *Coprosma crassifolia* and matagouri. Other canopy species are mistletoe (on *Coprosma propinqua* and rohutu), hybrid fuchsia, native convolvulus, scrub pohuehue, lawyer, bush lawyer, leafless lawyer, *Clematis marata* and gorse* (patchily distributed).

Occasionally emergent from this shrubland canopy are cabbage tree, kowhai, lancewood, matipo, mahoe, marbleleaf, narrow-leaved lacebark and rohutu.

Ground-cover species are *Rytidosperma* sp., browntop*, sweet vernal*, Yorkshire fog*, cocksfoot*, blue tussock, fescue tussock, plume grass, blue wheat grass, bracken, white fuzzweed, white clover*, haresfoot trefoil*, Deptford pink*, narrow-leaved plantain*, sheep's sorrel, Australian sheep's bur*, yarrow*, patotara, *Gnaphalium ruahinicum*, *Wahlenbergia gracilis*, mouse-ear hawkweed*, catsear*, *Dichondra repens*, *Geranium sessiliflorum*, *Crassula* sp., *Epilobium* sp., Californian thistle*, nodding thistle*, foxglove*, woolly mullein*, hawksbeard*, cleavers*, selfheal*, bidibid and necklace fern.

Also present in the lower valley are localized patches of Khasia berry*.

Birds/Fauna Observed:

Native birds observed during this survey were bellbird, fantail, silvereye, brown creeper, rifleman, kereru, grey warbler, spur-winged plover and harrier. Other native species likely to be present are tomtit (observed on the adjacent property), kingfisher and welcome swallow.

Notable Flora, Fauna and Habitats:

Important features of this area are the diversity of plant communities and species, the presence of one at-risk (naturally uncommon) plant species (*Einadia allanii*), locally uncommon plant species (including *Coprosma rhamnoides*, weeping mapou, *Parietaria debilis*, *Gentiana grisebachii*, dwarf mistletoe and white fuzzweed), the extensive habitat the area provides for forest birds including an 'at risk' species (rifleman), and the size of the area.

Notable Plant and Animal Pests:

The most important plant pest in the area is Khasia berry (*Cotoneaster simonsii*). This invasive species is present in the lower valley and poses a significant threat to open or low-growing plant communities. It has bird-dispersed fruits, so also poses a threat to other nearby areas. Other notable plant pests are elderberry and gorse. Elderberry is presently localized. Gorse is more widespread, especially at the forest margins, but does not pose a threat to indigenous woody plant communities. The net effect of gorse is probably beneficial at this site, as it buffers the indigenous plant communities and provides a suitable habitat for regeneration of

indigenous woody species. Other naturalized plant species at the site do not pose a significant threat, though some (such as burdock) may pose a threat to farming activities.

Animal pests were not surveyed, though several wallabies were seen and possum sign was present.

Boundaries (buffering, fencing, adjoining plant communities and habitats):

The forested part of this area is very well buffered by its location in a steep-sided valley and by the indigenous and gorse scrub communities at its margin. The site lies within a larger fenced paddock, though is grazed at the margins. The SNA extends beyond this property at its upper and lower margins.

Condition and Management Issues:

The forest canopy is in good condition. The forest understorey is, in places, depleted, presumably from the effects of wallabies. The most important management issues are control of Khasia berry, wallabies and possums. It wild animals are controlled and if grazing pressure is low, there will be continued forest regeneration.

Property Owner Comment:

Mr Black supports the protection of this area.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous vegetation typical of the ecological district.
Rarity	M	Provides habitat for an 'at risk' bird species (rifleman), an at-risk plant species (*Einadia allanii*) and several locally-uncommon plant species.
Diversity and pattern	H	Three main plant communities are present and plant species diversity is high: 98 indigenous plant species were recorded.
Distinctiveness/special features	M/H	The presence of an old matai tree and the abundance of kowhai are notable features. The area forms a relatively intact sequence of indigenous vegetation.
Other Criteria		
Size/shape	H	A very large area (the largest in this part of Timaru District) with a good shape and well buffered.
Connectivity	M/H	Adjoins and links other areas of forest at its upper and lower boundaries.
Long-term Sustainability	M/H	Control of plant and animal pests will be required to maintain ecological values in the long term.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):

This large area of forest has survived presumably because it has been uneconomic to clear for farming. Its steep slopes give it very limited potential for farm development. It lies at the property boundary.

Discussion:

This area easily meets the District Plan criteria for a Significant Natural Area. Important features of the area are the diversity of plant communities and species, the presence of an at-risk plant species (*Einadia allanii*), locally uncommon plant species (including matai, *Gentiana grisebachii*, dwarf mistletoe and white fuzzweed), the extensive habitat the area provides for forest birds including an 'at risk' species (rifleman), and the size of the area.

Scientific names of species cited by common name in this report

(Note: this is not a complete species list; it is a list only of species cited by common name in this report)

Common Name (* = naturalised species)	Scientific name
Australian sheep's bur*	*Acaena agnipila*
bidibid	*Acaena* sp.
bittersweet*	*Solanum dulcamara*
black nightshade*	*Solanum nigrum*
blue tussock	*Poa colensoi*
blue wheat grass	*Elymus solandri*
bracken	*Pteridium esculentum*
broadleaf	*Griselinia littoralis*
broad-leaved dock*	*Rumex obtusifolius*
broom*	*Cytisus scoparius*
browntop*	*Agrostis capillaris*
burdock*	*Arctium minus*
bush lawyer	*Rubus cissoides*
bush lily	*Astelia fragrans*
buttercup	*Ranunculus* sp.
cabbage tree/ti rakau	*Cordyline australis*
Californian thistle*	*Cirsium arvense*
catsear*	*Hypochoeris radicata*
clematis	*Clematis paniculata*
cocksfoot*	*Dactylis glomerata*
common shield fern	*Polystichum richardii*
crack willow*	*Salix fragilis*
creeping buttercup*	*Ranunculus repens*
dandelion*	*Taraxacum officinale*
Deptford pink*	*Dianthus armeria*
dwarf mistletoe	*Korthalsella lindsayi*
elderberry*	*Sambucus nigra*
fescue tussock	*Festuca novae-zelandiae*
five-finger	*Pseudopanax arboreus*
foxglove*	*Digitalis purpurea*
fuchsia	*Fuchsia excorticata*
gorse*	*Ulex europaeus*
hairy nightshade*	*Solanum physalifolium*
hairy pennywort	*Hydrocotyle moschata*
hanging spleenwort	*Asplenium flaccidum*
haresfoot trefoil*	*Trifolium arvense*
hawksbeard*	*Crepis capillaris*
hen and chickens fern	*Asplenium gracillimum*
hookgrass	*Uncinia* sp.
horehound*	*Marrubium vulgare*
hound's tongue fern	*Microsorum pustulatum*
hybrid fuchsia	*Fuchsia perscandens x excorticata*
kanuka	*Kunzea ericoides*
Khasia berry*	*Cotoneaster simonsii*
korokio	*Corokia cotoneaster*
koromiko	*Hebe salicifolia*
kowhai	*Sophora microphylla*
lancewood	*Pseudopanax crassifolius*
lawyer	*Rubus schmidelioides*
leafless lawyer	*Rubus squarrosus*
lemonwood	*Pittosporum eugenioides*
mahoe/whiteywood	*Melicytus ramiflorus*
maidenhair fern	*Adiantum cunninghamii*

male fern*	*Dryopteris filix-mas*
mapou	*Myrsine australis*
marbleleaf/putaputaweta	*Carpodetus serratus*
matagouri	*Discaria toumatou*
matai/black pine	*Prumnopitys taxifolia*
matipo/kohuhu	*Pittosporum tenuifolium*
mistletoe	*Ileostylis micranthus*
mountain akeake	*Olearia avicenniifolia*
mouse-ear hawkweed*	*Hieracium pilosella*
musk*	*Mimulus moschatus*
narrow-leaved lacebark	*Hoheria angustifolia*
narrow-leaved plantain*	*Plantago lanceolata*
native broom	*Carmichaelia australis*
native convolvulus	*Calystegia tuguriorum*
native jasmine	*Parsonsia* sp.
necklace fern	*Asplenium flabellifolium*
nettle*	*Urtica* sp.
nodding thistle*	*Carduus nutans*
pate	*Schefflera digitata*
patotara	*Leucopogon fraseri*
pennywort	*Hydrocotyle* sp.
perennial ryegrass*	*Lolium perenne*
plume grass	*Dichelachne crinita*
poataniwha	*Melicope simplex*
pohuehue	*Muehlenbeckia australis*
porcupine shrub	*Melicytus alpinus*
poroporo	*Solanum laciniatum*
prickly shield fern	*Polystichum vestitum*
purging flax*	*Linum catharticum*
red clover*	*Trifolium pratense*
rohutu	*Lophomyrtus obcordata*
sand spurrey*	*Spergularia rubra*
scrub pohuehue	*Muehlenbeckia complexa*
selfheal*	*Prunella vulgaris*
sheep's sorrel*	*Rumex acetosella*
shepherd's purse*	*Capsella bursa-pastoris*
silver tussock	*Poa cita*
soft rush*	*Juncus effusus*
star lily	*Arthropodium candidum*
stitchwort*	*Stellaria graminea*
suckling clover*	*Trifolium dubium*
sweet vernal*	*Anthoxanthum odoratum*
thousand-leaved fern	*Hypolepis millefolium*
toatoa	*Haloragis erecta*
totara	*Podocarpus totara*
velvety nightshade*	*Solanum chenopodioides*
water cress*	*Rorippa microphylla*
water forget-me-not*	*Myosotis laxa*
weeping mapou	*Myrsine divaricata*
white clover*	*Trifolium repens*
white fuzzweed	*Vittadina australis*
wineberry	*Aristotelia serrata*
woolly mullein*	*Verbascum thapsus*
yarrow*	*Achillea millefolium*
Yorkshire fog*	*Holcus lanatus*