TIMARU DISTRICT

SIGNIFICANT NATURAL AREAS SURVEY

EVANS PROPERTY
MT HORRIBLE-TAIKO-CAVE HILL

Report prepared for Timaru District Council by Mike Harding
March 2011

TIMARU DISTRICT SIGNIFICANT NATURAL AREAS SURVEY

PROPERTY REPORT

PROPERTY DETAILS:

Owner: ..... Peter and Jane Evans
Valuation References: .... 24850/009.00, 24850/021.01, 24850/025.01 and 24850/073.00
Address: ..... Pareora Gorge Road
Location: ..... On the southern slopes of Cave Hill, eastern slopes of lower Taiko valley and the southern slopes of Mt Horrible, near Evans Crossing.
Ecological District: ..... Waimate Ecological District.
TDC Land Type: ..... 'Soft Rock Hills and Downs' and 'Hard Rock Hills and Downs' (Cave Hill).
Land Environment: ..... N3 (eastern South Island undulating plains and hills).

ECOLOGICAL CONTEXT:

The property covers moderately-steep slopes at the southwest edge of the loess-covered basalt hills of the Timaru downlands (at Mt Horrible) and the southern slopes of Cave Hill, inland from Timaru in South Canterbury. 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 and basalt bluffs supported specialised floras, and riparian areas probably 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 limestone and basalt 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 and sparse rockland vegetation on and below basalt or limestone scarps near Mt Horrible, and in gullies on Cave Hill. The property lies adjacent to areas of forest on scarps east of Mt Horrible, effectively linking the areas of indigenous vegetation with those at Claremont Scenic Reserve.

The property was surveyed as part of the District-wide survey of Significant Natural Areas during November and December 2010. Most parts of the property were surveyed. Twenty areas, comprising approximately 52 hectares, are regarded as Significant Natural Areas (SNAs) when assessed against the District Plan criteria. These SNAs are listed in the table below.

Area No.	Area Name	Central grid reference	Aprox. size (ha)	Vegetation/habitat type
540a		J39: 557-457	2.42	hardwood forest
540b		J39: 558-454	0.93	hardwood forest
543a		J39: 553-461	0.29	regenerating hardwood forest
543b		J39: 554-459	2.16	regenerating hardwood forest
543c		J39: 556-454	0.28	regenerating hardwood forest
545a		J39: 552-442	4.66	hardwood forest; shrubland
545b		J39: 553-446	0.82	hardwood forest; shrubland
545c		J39: 554-450	5.04	hardwood forest; shrubland
553a	Main Cave Hill Gully	J39: 527-441	3.3	hardwood forest; scrub
554a		J39: 522-440	0.97	regenerating hardwood forest
555a	Cave Hill South	J39: 512-447	6.7	hardwood forest; shrubland
555b	Cave Hill South	J39: 516-448	2.96	hardwood forest; shrubland
555c	Cave Hill South	J39: 519-451	6.7	hardwood forest; shrubland
555d	Cave Hill South Scrub	J39: 521-447	1.65	shrubland; scrub; rockland
546a	Evans Crossing Limestone	J39: 545-439	7.11	shrubland; scrub; rockland
547a	Mt Horrible	J39: 550-435	7.14	hardwood forest; shrubland
547b	Mt Horrible	J39: 548-435	1.36	shrubland/scrub
547c	Mt Horrible	J39: 552-438	2.34	hardwood forest
549a		J39: 545-431	1.23	hardwood forest; shrubland
549b		J39: 546-430	1.13	hardwood forest

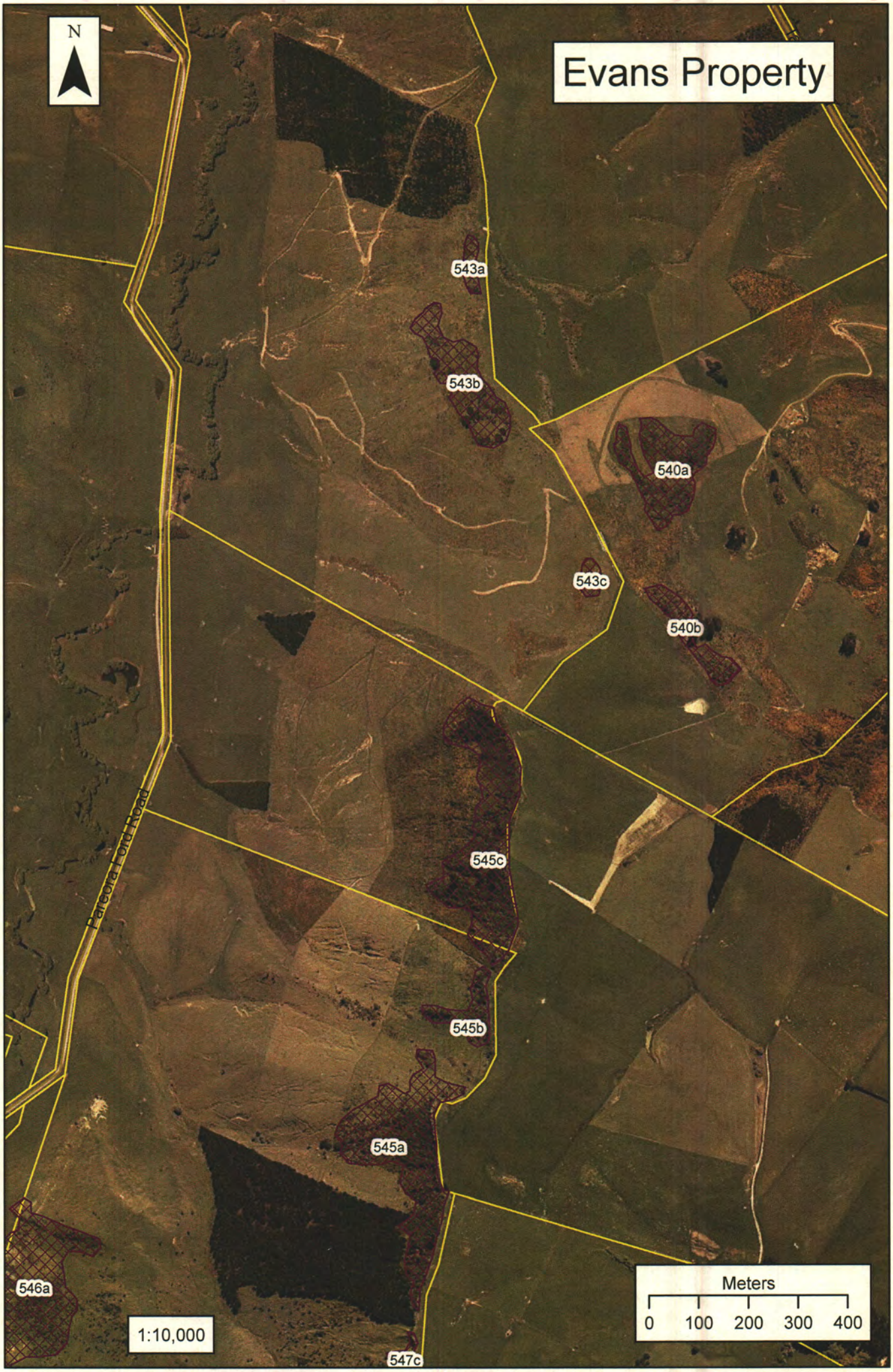
These SNAs are illustrated on the attached aerial photograph and described in greater detail on the SNA Forms in this report. Note that the boundaries of the SNAs are indicative, rather than precise. These areas meet the ecological criteria in the Timaru District Plan (criteria i-vi, pages B18-B19) and are considered to be sustainable in the long term, or sustainable with appropriate management (criterion vii, page B19). SNAs are subject to confirmation by Council after regarding the matters listed in the District Plan (pages B19-B20). It is expected that SNAs will eventually be listed in the District Plan by way of a notified plan change.

At present, consent is required from Council for clearance of areas of indigenous vegetation or habitat which meet the Interim Definitions in the District Plan. Clearance includes burning, spraying with herbicides and over-planting. SNAs encompass most, but not necessarily all, areas of vegetation and habitat which meet the Interim Definitions.

To assist with the protection and management of any SNA, landowners can apply to Council for financial assistance. Any questions regarding the protection, management and use of SNAs should be directed to the District Planner.

OTHER AREAS INSPECTED ON THE PROPERTY:

Other areas on the property were inspected but are not significant when assessed against the District Plan criteria. Areas worth noting are exposed basalt boulderfields, shrubland/scrub on mid-slopes and scattered shrubland on steeper slopes above the Pareora River at the property boundary. All these areas have the potential to recover, and perhaps become more important for nature conservation and biodiversity protection, if protected from clearance and other disturbance.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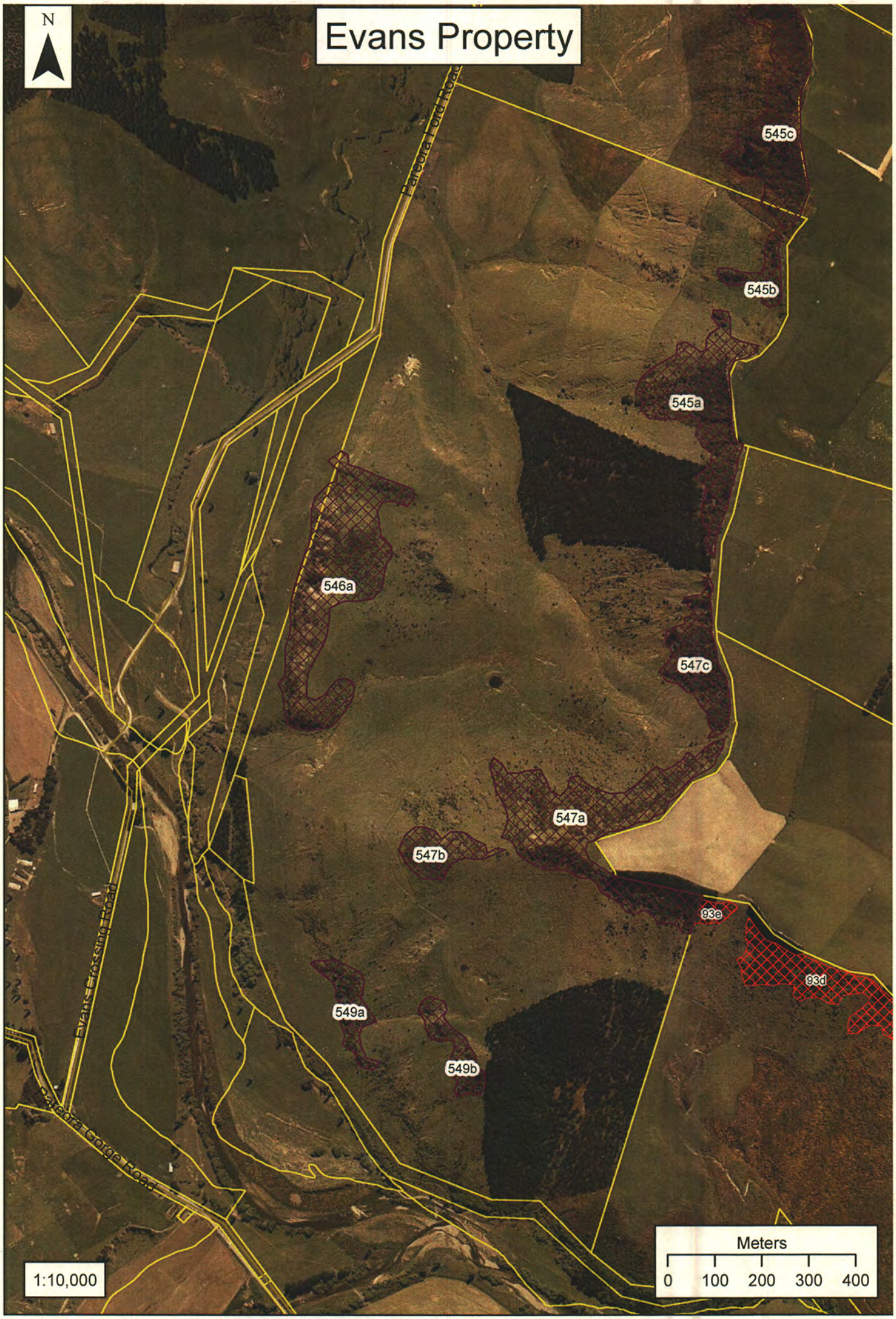
Evans Property
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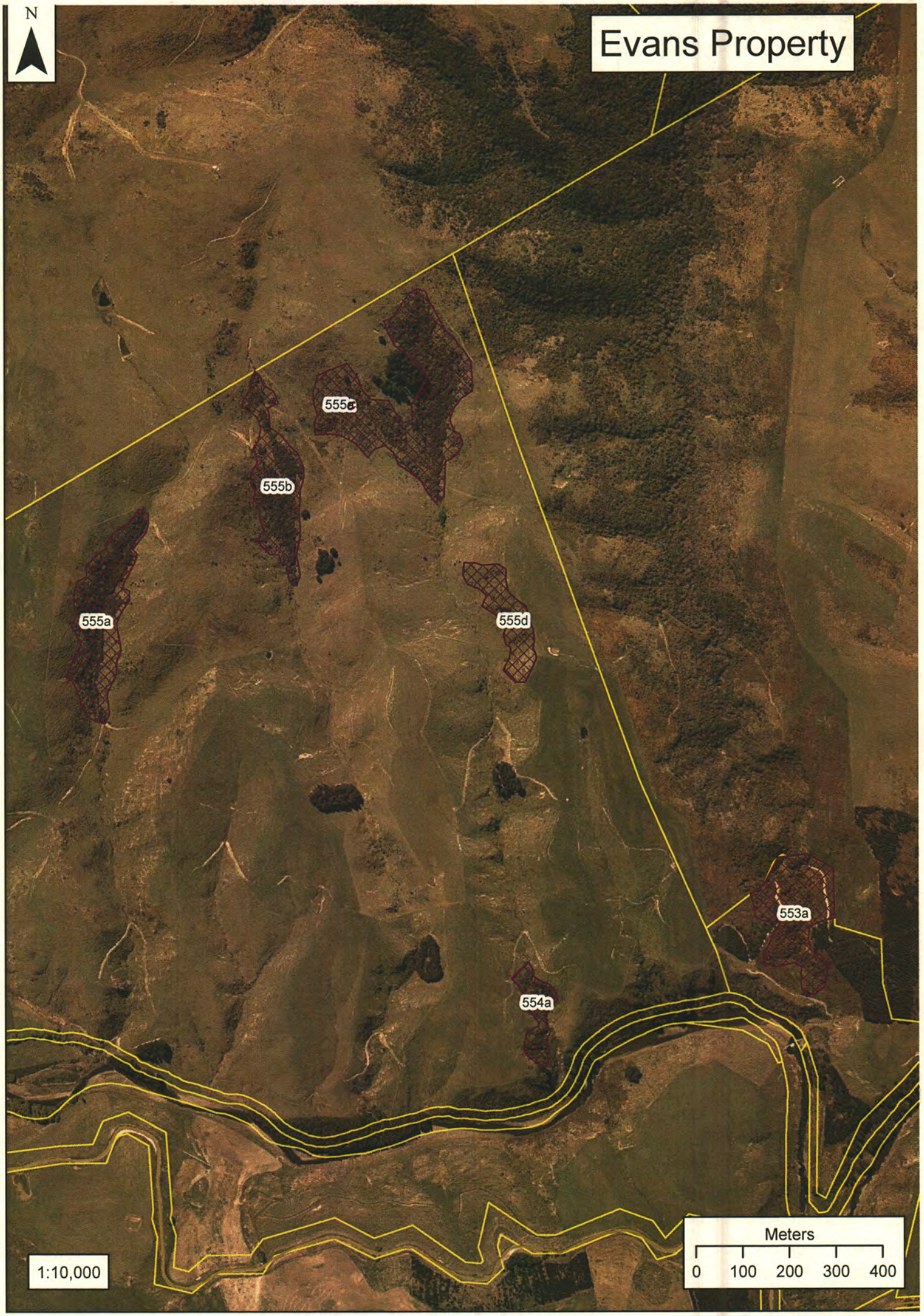
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TIMARU DISTRICT SNA SURVEY SNAs 540a and 540b

Area Name:
Property: Peter and Jane Evans
Ecological District: Waimate
Nearest Locality: Taiko Flat
AREA 540a: Location (central map ref.): J39: 557-457 **Area Size (ha):** 2.42 **Altitude (m):** 280-300
AREA 540b: Location (central map ref.): J39: 558-454 **Area Size (ha):** 0.93 **Altitude (m):** 280-300
Surveyors: Mike Harding **Survey Time:** 1½ hours **Survey Date:** 03-12-10

General Description:

These two SNAs lie on a steep to moderately-steep east-facing basalt scarp and boulder field near the ridge crest west of Taiko Road. The two areas are separated by recently-planted radiata pine trees and are otherwise surrounded by developed pasture.

Plant Communities:

Indigenous hardwood forest is the main plant community present at each area. The two areas are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Northern area (SNA 540a):

The forest canopy of this area is dominated by broadleaf and mahoe. Other canopy species present are cabbage tree, mapou, five-finger, matipo, kowhai (rare), lawyer and pohuehue.

Understorey species are *Coprosma crassifolia*, *Coprosma propinqua*, *Coprosma propinqua* X *robusta*, mahoe, mapou, wineberry and a single spreading bush of a naturalized tree (*Tilia* sp?).

The forest floor is dominated by large basalt boulders. Forest floor species are necklace fern, *Asplenium hookerianum*, *Asplenium appendiculatum*, hanging spleenwort, *Pellaea rotundifolia*, common shield fern, hound's tongue fern (rare), *Libertia ixioides* and seedlings of matipo, mahoe, cabbage tree, elderberry* and *Coprosma* species.

Plant species commonly present at the forest margin or in forest openings are gorse*, broom*, radiata pine*, *Coprosma propinqua*, *Coprosma crassifolia*, mahoe, koromiko, leafless lawyer, scrambling fuchsia, native convolvulus, toatoa, poroporo, black nightshade*, common shield fern, Californian thistle*, Scotch thistle*, nodding thistle*, *Senecio wairauensis*, cocksfoot*, cleavers* and foxglove*.

Southern area (SNA 540b):

The forest canopy of this area is dominated by broadleaf, matipo and mahoe. Other canopy species present are cabbage tree, mapou and kowhai (rare).

Understorey species are *Coprosma crassifolia*, *Coprosma propinqua* and mapou.

The forest floor is dominated by large basalt boulders. Forest floor species are common shield fern, *Pellaea rotundifolia*, necklace fern, leafless lawyer, black nightshade* and seedlings of matipo, mahoe, mapou and *Coprosma crassifolia*.

Plant species commonly present at the forest margin or in forest openings are *Coprosma crassifolia*, *Coprosma propinqua*, gorse*, radiata pine*, matagouri, leafless lawyer, lawyer, foxglove* and native convolvulus.

Birds/Fauna Observed:

Native birds observed during this brief survey were fantail, grey warbler, bellbird, brown creeper, harrier, and black-backed gull (overhead).

Notable Flora, Fauna and Habitats:

Important features of these areas are the presence of indigenous woody vegetation on basalt, the habitat the areas provide for forest birds and the contribution the areas make to the network of habitat in the wider area.

Notable Plant and Animal Pests:
No invasive plant pests were observed. Self-sown pine trees may become established in the forest gaps and margins. Gorse is the most widespread plant pest present, but it does not pose a significant threat to the indigenous forest. Animal pests were not surveyed, though possum sign was observed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):
Both areas are well buffered by their locations on steeper rocky slopes and are further buffered by plantation pines. These patches are otherwise surrounded by grazed pasture, though they lie close to other small areas of indigenous forest and scrub on steep slopes and scarps.

Condition and Management Issues:
The forest patches are in reasonably good condition. Ongoing animal pest control is probably the most important management issue.

Property Owner Comment:
These areas were previously grazed hard by deer. Intend to plant more pine trees adjacent to this area.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	An example of regenerating indigenous forest typical of the ecological district.
Rarity	M	No rare species were observed. Indigenous forest on basalt is a nationally-uncommon plant community.
Diversity and pattern	L/M	Relatively low plant species diversity.
Distinctiveness/special features	L/M	Some steep basalt slopes and scarps are present.
Other Criteria		
Size/shape	M	Small areas, though with a good shape and very well buffered.
Connectivity	M	These areas lie close to other similar areas of indigenous vegetation, contributing to the network of fauna habitat in the area.
Long-term Sustainability	M/H	These areas are well protected by the rocky substrate but will probably require ongoing animal pest control to maintain ecological values in the long term.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
These areas have been protected from clearance. They have very little potential for farm development.

Discussion:
These areas just meet the District Plan criteria for Significant Natural Areas. Important features of the areas are the presence of indigenous woody vegetation on basalt, the habitat the areas provide for forest birds and the contribution the areas make to the network of habitat in the wider area.

TIMARU DISTRICT SNA SURVEY SNAs 543a, b and c

Area Name:	**Property:** Peter and Jane Evans	
Ecological District: Waimate	**Nearest Locality:** Taiko Flat	
AREA 543a: Location (central map ref.): J39: 553-461	**Area Size (ha):** 0.29	**Altitude (m):** 280-300
AREA 543b: Location (central map ref.): J39: 554-459	**Area Size (ha):** 2.16	**Altitude (m):** 280-320
AREA 543c: Location (central map ref.): J39: 556-454	**Area Size (ha):** 0.28	**Altitude (m):** 320-330
Surveyors: Mike Harding	**Survey Time:** 1½ hours	**Survey Date:** 03-12-10

General Description:

These three SNAs lie on the steep to moderately-steep basalt scarp and adjacent west-facing boulder slopes along the main ridge on the property. These three small areas are described together as they all support small populations of the 'at risk' (declining) shrub *Teucridium parvifolium*.

Plant Communities:

The main plant communities present in these areas are regenerating hardwood forest and small areas of rockland amongst scrub. These plant communities are described separately for each area below. Naturalized (exotic) species are indicated with an asterisk*.

Northern area (SNA 543a):

The scattered low-stature forest here is dominated by mahoe. Other canopy species are broadleaf, cabbage tree, mapou, elderberry*, native convolvulus, pohuehue and lawyer.

This forest is surrounded by scrub dominated by *Coprosma crassifolia* and gorse*. Other woody species present are *Coprosma propinqua*, porcupine shrub, matagouri, broom*, poroporo and two patches of *Teucridium parvifolium* (comprising seven plants in total).

Ground-cover and rockland species are *Asplenium appendiculatum*, common shield fern, hound's tongue fern, bracken, toatoa, *Dichondra repens*, *Libertia ixioides*, *Oxalis* sp., *Carex* sp. and hairy pennywort.

Central area (SNA 543b):

Taller woody vegetation is present at either end of this area and separated by dense scrub. Several large radiata pine* trees are emergent from this low-stature vegetation. Patches of trees are dominated by mahoe and broadleaf. Other canopy species are cabbage tree and elderberry*.

Scrub communities here are dominated by gorse* with dense stands of *Coprosma crassifolia* at the upper margin. Other scrub species present are *Coprosma propinqua*, poataniwha (rare), porcupine shrub, broom*, native convolvulus, scrub pohuehue, pohuehue, scrambling fuchsia, poroporo and, at the northern edge, two plants of *Teucridium parvifolium*.

Ground cover and rockland species are toatoa, koromiko, leafless lawyer, bracken, male fern*, woolly mullein*, *Carex* sp and one large patch of the indigenous grass, *Microlaena polynoda*.

Southern area (SNA 543c):

This area supports a very small patch of forest with one emergent radiata pine* tree. Forest trees are broadleaf, mahoe, matipo, mapou, cabbage tree and one small totara tree. The totara has a trunk diameter (at breast height) of 30cm and grows next to a large old (dead) totara tree.

Adjoining the forest at its lower boundary is scrub dominated by gorse*. Other scrub species present are *Coprosma crassifolia*, *Coprosma propinqua*, *Melicytus* aff. *alpinus*, elderberry*, native convolvulus, scrub pohuehue and, at the northern edge, two plants of *Teucridium parvifolium*.

Ground-cover and rockland species are toatoa, necklace fern, *Pellaea rotundifolia*, common shield fern, *Libertia ixioides*, hairy pennywort, *Dichondra repens* and *Oxalis* sp.

Birds/Fauna Observed:

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

Notable Flora, Fauna and Habitats:
Important features of these areas are the presence of indigenous woody vegetation on basalt, three separate populations of the 'at risk' shrub *Teucridium parvifolium*, several locally-uncommon species (porcupine shrub, *Melicytus* aff. *alpinus* and *Microleana polynoda*). The presence of totara is also notable, as it is absent from most forest patches in this area.

Notable Plant and Animal Pests:
Gorse is the most obvious plant pest present, though it does not pose a significant threat to indigenous woody vegetation. Broom, elderberry and introduced grasses are present and may displace indigenous species from rocky habitats. Animal pests were not surveyed though possum sign was observed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):
These three areas are well buffered by their location on steep boulder slopes or rock bluffs. The gorse scrub at their margins also provides some buffering from domestic stock in the surrounding paddocks. The areas are separated by grazed pasture, though lie relatively close to one another and to other larger areas of indigenous vegetation further south along the ridge.

Condition and Management Issues:
These areas are in relatively poor condition. Plant species remaining are relatively resilient and well protected by the steep rocky substrate. The main threat to these areas is probably uncontrolled fire, followed by animal pests (notably possums). Removal of the pine trees would be desirable.

Property Owner Comment:
Totara is also present nearby on an adjacent property.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	**M**	Depleted plant communities though typical of other remaining indigenous vegetation and still largely representative of vegetation on rocky substrates in the ecological district.
Rarity	**M/H**	Each area supports populations of the 'at risk' shrub, *Teucridium parvifolium*. Several other locally uncommon plant species are present.
Diversity and pattern	**L/M**	Moderate diversity for such sites, though species diversity is probably reduced from that formerly present.
Distinctiveness/special features	**M**	The presence of a single totara tree is a notable feature.
Other Criteria		
Size/shape	**M**	Each area is relatively small though all are well buffered.
Connectivity	**M**	These areas contribute to the network of fauna habitat in the wider area.
Long-term Sustainability	**M**	Prevention of fire and control of wild animals 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 have been protected from clearance by their location on steep rocky slopes. They have very little potential 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 woody vegetation on basalt, three separate populations of the 'at risk' shrub *Teucridium parvifolium*, several locally-uncommon species (porcupine shrub, *Melicytus* aff. *alpinus* and *Microleana polynoda*) and the presence of totara.

SNA 543b (foreground) and SNA 543c (back left, with pine tree)

Young totara tree at SNA 543c

The 'at-risk' shrub, Teucridium parvifolium, at SNA 543a

Looking north along the basalt scarp, at SNA 545a (centre-right) and 545c (centre distance)

TIMARU DISTRICT SNA SURVEY — SNAs 545a, b and c

Area Name:
Ecological District: Waimate
AREA 545a: Location (central map ref.): J39: 552-442
AREA 545b: Location (central map ref.): J39: 553-446
AREA 545c: Location (central map ref.): J39: 554-450
Surveyors: Mike Harding

Property: Peter and Jane Evans
Nearest Locality: Evans Crossing
Area Size (ha): 4.66 **Altitude (m):** 300-360
Area Size (ha): 0.82 **Altitude (m):** 320-340
Area Size (ha): 5.04 **Altitude (m):** 300-340
Survey Time: 2½ hours **Survey Date:** 29-11-10 and 03-12-10

General Description:

These three SNAs lie close to one another on the upper west-facing slopes of the lower (southern) Taiko valley. All three are located on steep areas of basalt boulder slope and scarp.

Plant Communities:

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

Northern area (SNA 545c):
The forest canopy here is dominated by mahoe and broadleaf. Other canopy species are cabbage tree, mapou, matipo, kowhai (rare), marbleleaf, *Coprosma crassifolia*, native convolvulus, pohuehue and occasional emergent radiata pine* trees.

Understorey species are mahoe, mapou, matipo, broadleaf and *Coprosma crassifolia*. Ground-cover species are *Libertia ixioides*, necklace fern, *Asplenium appendiculatum*, hanging spleenwort, hookgrass and seedlings of matipo and mahoe.

Species present at the upper forest margin are *Coprosma crassifolia*, matipo, koromiko, gorse*, broom*, poroporo, pohuehue, scrub pohuehue and hound's tongue fern.

The scrub/shrubland community along the lower margin of this area was not surveyed. It is dominated by gorse* with scattered indigenous species. Recently-planted pine trees are present on slopes below the area.

Central area (SNA 545b):
The forest canopy of this relatively small area is dominated by broadleaf. Other canopy species are cabbage tree, mapou, mahoe, kowhai, matipo, native jasmine and native convolvulus.

Understorey species are *Coprosma crassifolia* and mahoe. The ground-cover within the forest is dominated by large boulders. Species associated with the boulders at the forest margin are *Geranium microphyllum*, *Oxalis* sp., necklace fern and *Libertia ixioides*.

Species present at the forest margin are *Coprosma crassifolia*, *Coprosma propinqua*, matagouri, native broom, silver tussock, woolly mullein* and lawyer.

Southern area (SNA 545a):
The forest canopy here is dominated by broadleaf and mahoe. Other canopy species are cabbage tree, matipo, mapou, five-finger, kowhai (rare), pohuehue, with occasional emergent radiata pine* trees.

Understorey species are *Coprosma crassifolia*, mapou, matipo, mahoe, scrambling fuchsia and bush lawyer. Ground-cover species are hound's tongue fern, necklace fern, *Asplenium hookerianum*, *Blechnum vulcanicum* (rare), common shield fern, *Libertia ixioides*, hairy pennywort, *Dichondra repens*, black nightshade* and seedlings of mapou.

Species present at the forest margin or in forest openings are *Coprosma propinqua*, *Coprosma crassifolia*, matagouri, gorse*, broom*, poroporo, lawyer, leafless lawyer, pohuehue, creeping pohuehue, native convolvulus, silver tussock, blue tussock, *Elymus solandri*, horehound*, bracken, toatoa and bush lily (rare).

The scrub/shrubland community along the lower slopes is dominated by *Coprosma crassifolia*, matagouri and gorse*.

Birds/Fauna Observed:
Native birds observed during this brief survey were grey warbler, welcome swallow, fantail, bellbird, brown creeper and harrier.

Notable Flora, Fauna and Habitats:
Important features of these areas are the presence of relatively extensive areas of forest on basalt, locally-uncommon plant species (*Blechnum vulcanicum* and creeping pohuehue), the extent of forest bird habitat and the contribution the areas make to the network of fauna habitat in the wider area.

Notable Plant and Animal Pests:
No significant plant pests are present within the forest apart from occasional emergent pine trees. Other plant pests, such as gorse and broom, are present only at the forest margin and do not pose a threat to taller forest. Animal pests were not surveyed, though possum sign was observed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):
These three areas are well buffered by their location on steep rocky slopes. SNA 545c is also buffered by gorse scrub and plantation pines on lower slopes. These areas are separated by relatively small areas of pasture or shrubland and lie close to other areas of indigenous forest.

Condition and Management Issues:
These areas are in relatively good condition. The main management actions are protection from fire and regular animal pest (especially possum) control.

Property Owner Comment:
Gorse control is a major focus in this area.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	Typical examples of indigenous forest in this part of the ecological district.
Rarity	M	Indigenous forest on basalt is nationally uncommon. The areas support two locally uncommon plant species.
Diversity and pattern	M	Moderate species diversity, though diversity is probably reduced from that formerly present.
Distinctiveness/special features	M	The extensive areas of large-boulder substrate within the forests are special features.
Other Criteria		
Size/shape	M/H	The northern and southern areas are relatively large; all are well buffered.
Connectivity	M/H	These areas form a broken corridor of indigenous vegetation along the scarp crest and upper slopes.
Long-term Sustainability	M/H	Protection from fire and animal pests will be necessary to protection ecological values in the long term.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
These areas are protected by their location on steep rocky slopes. They have very little potential for farm development.

Discussion:
These areas meet the District Plan criteria for Significant Natural Areas. Important features of the areas are the presence of relatively extensive areas of forest on basalt, locally-uncommon plant species (*Blechnum vulcanicum* and creeping pohuehue), the extent of forest bird habitat and the contribution the areas make to the network of fauna habitat in the wider area.

TIMARU DISTRICT SNA SURVEY SNA 546a

Area Name: Evans Crossing Limestone
Location (central map reference): J39: 545-439
Ecological District: Waimate
Surveyors: Mike Harding
Property: Peter and Jane Evans
Nearest Locality: Evans Crossing
Area Size (ha): 7.11 **Altitude (m):** 140-200
Survey Time: 1½ hours **Survey Date:** 29-11-10

General Description:
This SNA lies on an exposed limestone scarp and adjacent gentler slopes just east of Evans Crossing.

Plant Communities:
Two main plant communities are present: vegetation (including forest patches) on the exposed limestone and shrubland/scrub on the gentler slopes. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Limestone rockland:

Woody species and climbers present on or associated with the exposed limestone rock are broadleaf, cabbage tree, *Coprosma propinqua*, elderberry*, mountain akeake, koromiko, porcupine shrub, matagouri, native broom, sweet brier*, native convolvulus, pohuehue, scrub pohuehue, leafless lawyer and blackberry*. Herbs present are toatoa, *Gingidia enysii*, *Senecio glaucophyllus*, *Epilobium nummularifolia*, stonecrop*, purging flax*, Scotch thistle*, Californian thistle*, foxglove*, cleavers*, narrow-leaved plantain*, mouse-ear hawkweed*, *Trifolium dubium**, storksbill*, dandelion*, hemlock*, woolly mullein*, *Urtica* sp*, *Stellaria gracilenta*, *Dichondra repens* and black nightshade*. Ferns and native grasses are *Asplenium lyallii*, *Adiantum cunninghamii*, blue tussock and *Elymus solandri*.

Shrubland and scrub:

Shrubland and scrub, mostly on grassy slopes above the limestone scarp, are dominated by *Coprosma propinqua* and matagouri. Other species present are native broom, *Coprosma virescens* (rare), cabbage tree, kowhai (rare), native mistletoe (on *Coprosma propinqua*), pohuehue, scrub pohuehue, native convolvulus, blue tussock and narrow-leaved snow-tussock (rare).

Birds/Fauna Observed:
Native birds observed during this brief survey were bellbird, warbler and welcome swallow.

Notable Flora, Fauna and Habitats:
Important features of this area are the presence of indigenous vegetation on limestone, a healthy population of a locally-uncommon limestone plant (*Gingidia enysii*), the presence of the locally-uncommon *Coprosma virescens*, and the proximity of the area to other areas of indigenous vegetation.

Notable Plant and Animal Pests:
A wide range of naturalized herbs and grasses are present on or associated with the limestone. Otherwise, the only significant plant pests are elderberry, sweet brier and blackberry. Animal pests were not surveyed though possum sign was observed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):
This area lies unfenced within a larger paddock. Parts of the site on the steeper rock faces are well buffered from the effects of grazing. The area lies close to extensive areas of shrubland and scrub on higher slopes (SNAs 547a and b).

Condition and Management Issues:
Small patches of vegetation that are inaccessible to stock are in good condition; other areas are affected by grazing. Shrubland and scrub communities on the slopes above the exposed limestone are in relatively good condition.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	A good example of indigenous vegetation typical of such sites in the ecological district.
Rarity	M/H	Indigenous vegetation on limestone is a nationally-rare community. Two locally-uncommon plant species are present.
Diversity and pattern	M	Species diversity is typical of such sites, though depleted from its former condition.
Distinctiveness/special features	M	The extent of the exposed limestone is a feature.
Other Criteria		
Size/shape	M/H	A moderate sized area with a reasonably good shape and mostly well buffered.
Connectivity	M	Lies close to other areas of indigenous vegetation.
Long-term Sustainability	M	The core area on limestone is well protected. Some management may be required to maintain ecological values at other parts of the site.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
The steeper parts of this site are unsuitable for farm development. Gentler scrub-covered parts have some potential for 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, a healthy population of a locally-uncommon limestone plant (*Gingidia enysii*), the presence of the locally-uncommon *Coprosma virescens*, and the proximity of the area to other areas of indigenous vegetation.

TIMARU DISTRICT SNA SURVEY — SNA 547a, b and c

Area Name: Mt Horrible
Ecological District: Waimate
AREA 547a: Location (central map ref.): J39: 550-435
AREA 547b: Location (central map ref.): J39: 548-435
AREA 547c: Location (central map ref.): J39: 552-438
Surveyors: Mike Harding

Property: Peter and Jane Evans
Nearest Locality: Evans Crossing
Area Size (ha): 7.14 **Altitude (m):** 280-380
Area Size (ha): 1.36 **Altitude (m):** 300-340
Area Size (ha): 2.34 **Altitude (m):** 340-370
Survey Time: 3½ hours **Survey Date:** 29-11-10

General Description:

These three SNAs lie on and below the basalt scarp of Mt Horrible, at the southwest edge of the Timaru Downs. The sites occupy steep to moderately-steep north- and west-facing slopes that are dominated by the basalt scarp and the basalt boulder fields below the scarp.

Plant Communities:

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

Western shrubland, SNA 547b:

This area of shrubland/scrub is dominated by *Coprosma propinqua*, *Coprosma crassifolia* and leafless lawyer, with emergent trees of broadleaf, cabbage tree and mapou. Other species present are matagouri, sweet brier*, *Coprosma rugosa* (rare), lawyer, scrambling fuchsia, native convolvulus, scrub pohuehue, pohuehue, bracken, Californian thistle*, pasture grasses* and blue tussock. Additional species present at rocky sites (basalt boulders) are necklace fern, *Asplenium hookerianum*, common shield fern, *Pellaea rotundifolia*, *Dichondra repens*, toatoa, hairy pennywort, *Libertia ixioides* and bidibid.

Central (Mt Horrible) forest and shrubland, SNA 547a:

Tongues of forest on the bouldery slopes below the basalt bluff are dominated by broadleaf, mahoe and, at the base of the bluff, kowhai. Other canopy species present are mapou, cabbage tree, leafless lawyer, native jasmine, pohuehue and native convolvulus.

The forest understorey is relatively open. Species present are mapou, mahoe, *Coprosma propinqua*, *Coprosma crassifolia*, poroporo, leafless lawyer and native convolvulus.

Ground-cover species are necklace fern, common shield fern, hound's tongue fern, *Pellaea rotundifolia*, *Libertia ixioides* and seedlings of mapou, velvety nightshade* and *Coprosma* species.

Additional species at rocky sites are *Helichrysum lanceolatum*, korokio, *Asplenium appendiculatum*, leather-leaf fern, *Dichondra repens*, *Crassula* sp., *Einadia allanii* and woolly mullein*.

Shrubland and scrub at the forest margins or in forest openings are dominated by *Coprosma propinqua*. Other species present are *Coprosma crassifolia*, korokio, matagouri, native broom, matipo, sweet brier* (rare), lawyer, leafless lawyer, *Clematis foetida*, bracken, *Senecio quadridentatus*, foxglove*, *Juncus distegus*, patotara and blue tussock.

Two shrubs of the 'at risk' (declining) *Teucridium parvifolium* are present at the forest margin.

Additional species on the southern side of Mt Horrible are *Coprosma rigida*, fuchsia, scrambling fuchsia, wineberry, *Coprosma propinqua* x *robusta*, koromiko, dwarf mistletoe (on *Coprosma crassifolia* and *Helichrysum lanceolatum*), bush lawyer, scrub pohuehue, tree nettle, speargrass (*Aciphylla* sp.), *Aciphylla subflabellata* (rare), prickly shield fern, *Asplenium hookerianum*, hen and chickens fern, *Blechnum fluviatile*, thousand-leaved fern, bidibid and hairy pennywort.

Northern forest, SNA547c:

The forest canopy here is dominated by broadleaf and cabbage tree. Other canopy species are mahoe, mapou and pohuehue.

The forest understorey is open. Species present are *Coprosma crassifolia*, *Coprosma propinqua*, koromiko, korokio, mapou, bush lawyer, lawyer and native convolvulus.

The dominant ground-cover species is hound's tongue fern. Other species present are necklace fern, *Asplenium hookerianum*, *Blechnum procerum*, common shield fern, bush lily, *Libertia ixioides*, toatoa and seedlings of cabbage tree, native convolvulus and *Coprosma* species.

Species commonly present at rocky sites, on or associated with the basalt boulders and bluff, are necklace fern, hanging spleenwort, common shield fern, *Oxalis* sp. and *Dichondra repens*.

Species present at the forest margin are *Coprosma propinqua*, *Coprosma crassifolia*, korokio, matagouri, kowhai (rare), gorse*, scrub pohuehue, leafless lawyer, lawyer, native convolvulus, pohuehue, scrambling fuchsia and bracken.

Northern side of SNA 547a

Birds/Fauna Observed:
Native birds observed during this brief survey were grey warbler, fantail, harrier, welcome swallow, brown creeper, shining cuckoo, rifleman and bellbird.

Notable Flora, Fauna and Habitats:
Important features of these areas are the extent of the forest and shrubland community on basalt, the presence of two 'at-risk' (declining) plant species (*Teucridium parvifolium* and *Aciphylla subflabellata*), locally

uncommon plant species (*Coprosma rugosa*, tree nettle, thousand-leaved fern and dwarf mistletoe), the habitat the areas provide for an 'at-risk' bird species (rifleman) and the size of the areas.

Notable Plant and Animal Pests:
No significant plant pests were observed, except for gorse and sweet brier, though these species do not pose a significant threat to indigenous vegetation at the site. Animal pests were not surveyed, though possum sign was observed and both wallabies and tahr are present in a nearby area of forest.

Boundaries (buffering, fencing, adjoining plant communities and habitats):
These areas are mostly well buffered by their locations on steep boulder slopes. They are linked by areas of shrubland and lie close to other areas of indigenous forest.

Condition and Management Issues:
These SNAs are in relatively good condition and should continue to improve so long as grazing pressure is not increased and wild animal populations are controlled.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	These areas of forest and scrub are typical of that remaining in the ecological district; rockland vegetation is probably representative of that originally present.
Rarity	M/H	SNA 547a supports two 'at-risk' (declining) plant species. The area provides habitat for an 'at-risk' bird species (rifleman). Four locally-uncommon plant species are present. Indigenous vegetation on basalt is a nationally uncommon community.
Diversity and pattern	M/H	A relatively diverse site with rockland, boulderfield and loess substrates at different aspects.
Distinctiveness/special features	M	The dominance and height of the basalt scarp is a special feature.
Other Criteria		
Size/shape	M/H	A moderate to large site that is well buffered.
Connectivity	M/H	Lies close to other areas of indigenous vegetation and links those communities along the scarp.
Long-term Sustainability	M/H	Some animal pest control is likely to be necessary to maintain ecological values in the long term.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
Most parts of these SNAs lie on steep rocky slopes that have very limited potential for farm development.

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 community on basalt, the presence of two 'at-risk' (declining) plant species (*Teucridium parvifolium* and *Aciphylla subflabellata*), locally uncommon plant species (*Coprosma rugosa*, tree nettle, thousand-leaved fern and dwarf mistletoe), the habitat the areas provide for an 'at-risk' bird species (rifleman) and the size of the areas. SNA 547a is the most significant of the three SNAs.

TIMARU DISTRICT SNA SURVEY SNA 549a

Area Name:
Location (central map reference): J39: 545-431
Ecological District: Waimate
Surveyors: Mike Harding
Property: Peter and Jane Evans
Nearest Locality: Evans Crossing-Taiko Flat
Area Size (ha): 1.23 **Altitude (m):** 120-150
Survey Time: ½ hour **Survey Date:** 22-10-10

General Description:

This SNA lies on moderately-steep lower hill slopes below Mt Horrible, at the southwest edge of the Timaru downlands. It comprises small limestone scarps and adjacent slopes and is linked to other areas of indigenous vegetation by areas of indigenous shrubland.

Plant Communities:

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

Hardwood forest:

The forest canopy is dominated by broadleaf and pohuehue. Other canopy species are mahoe, cabbage tree, five-finger, mountain akeake, elderberry*, lawyer and native convolvulus. Ground-cover species are hairy pennywort, black nightshade*, burdock*, hemlock*, nettle*, nodding thistle* and *Blechnum fluviatile.*

Species present on or associated with the limestone rock are mountain akeake, porcupine shrub (rare), silver tussock, blue tussock, common shield fern, *Blechnum chambersii*, necklace fern, bidibid, *Epilobium* sp., *Dichondra repens*, *Cardamine debilis*, scrub pohuehue, *Galium aparine**, gooseberry*, horehound* and other naturalized herbs and grasses.

Species commonly present on the forest margin are *Coprosma propinqua*, matagouri, koromiko, native broom, gorse* (rare) and foxglove*.

Shrubland/scrub:

Dense scrub is present at the upper forest margin, grading to pasture with scattered shrubs (shrubland) on some adjacent slopes. Dominant shrub species are *Coprosma propinqua* and matagouri. Other species present are cabbage tree, native broom, sweet brier*, gorse*, mahoe (rare), pohuehue, lawyer (rare), silver tussock and fescue tussock.

Birds/Fauna Observed:

Native birds observed during this brief survey were grey warbler, welcome swallow, brown creeper and bellbird.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of indigenous woody vegetation on limestone, the habitat the area provides for forest birds and the contribution it makes to the network of fauna habitat in the wider area.

Notable Plant and Animal Pests:

The taller woody vegetation is largely unaffected by invasive plant pests, except for the native climber, pohuehue (*Muehlenbeckia australis*). Exposed limestone is threatened by a range of naturalized grasses and herbs. Other plant pests present, such as gorse and burdock, are agricultural weeds that do not pose a significant threat to the forest or shrubland. Animal pests were not surveyed.

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

This area is buffered to some extent by its location on steeper slopes and limestone scarps. It is grazed as part of a large paddock, though vegetation on the steeper rock is inaccessible to stock. There are relatively extensive areas of indigenous shrubland on adjacent slopes and the area lies close to other areas of indigenous forest on upper slopes.

Condition and Management Issues:
The forest canopy is in good condition. The forest understorey and margins (where accessible to stock) are depleted. Protection of the area from grazing would enable regeneration of understorey species. Some control of the invasive native climber, pohuehue, would be beneficial.

Property Owner Comment:
Muehlenbeckia is a concern here. Gorse control is a management priority.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	A good example of depleted or regenerating forest typical of that remaining at similar sites in the ecological district.
Rarity	M	Indigenous forest on limestone is a nationally uncommon plant community.
Diversity and pattern	L/M	Low plant species diversity; diversity is substantially reduced from that likely to have been originally present.
Distinctiveness/special features	M	Several steep intact limestone scarps and blocks are present.
Other Criteria		
Size/shape	M	A small area with a relatively good shape and well buffered.
Connectivity	M	Connected to other areas of indigenous vegetation by indigenous shrubland; lies relatively close to other areas of indigenous forest.
Long-term Sustainability	M	The core area on the steeper limestone is well protected. Plant and animal pest control 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 is naturally protected by its location on steep slopes. It has little 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 woody vegetation on limestone, the habitat the area provides for forest birds and the contribution the area makes to the network of fauna habitat in the wider area.

TIMARU DISTRICT SNA SURVEY SNA 549b

Area Name:
Location (central map reference): J39: 546-430
Ecological District: Waimate
Surveyors: Mike Harding
Property: Peter and Jane Evans
Nearest Locality: Evans Crossing-Taiko Flat
Area Size (ha): 1.13 **Altitude (m):** 180-220
Survey Time: 1 hour **Survey Date:** 22-10-10

General Description:
This SNA lies on the steep slopes of a small spur below Mt Horrible, on the southwest edge of the Timaru downlands. It lies mostly on basalt outcrops. A mature pine plantation borders the area to the east and scattered shrubland is present on other boundaries.

Plant Communities:
The main plant community present is hardwood forest, described below. Naturalized (exotic) species are indicated with an asterisk*.

The canopy of this forest is dominated by broadleaf and cabbage tree. Other canopy species are mahoe, matipo, kowhai (in the northern part) and bush lawyer.

The sparsely vegetated forest understorey is dominated by basalt boulders. Plant species are *Coprosma crassifolia*, broadleaf, sycamore* (rare), gooseberry*, scrambling fuchsia, leafless lawyer and native convolvulus.

Ground-cover species are common shield fern, foxglove* and burdock* (rare). Plant species on or associated with the basalt boulders are necklace fern, *Asplenium hookerianum*, common shield fern, hound's tongue fern, toatoa, *Ranunculus* sp., *Linum catharticum**, pennywort, hairy pennywort, *Leptinella squalida*, *Geranium* sp. and *Cardamine debilis*.

Scrub and shrubland at the forest margins are dominated by *Coprosma propinqua* and *Coprosma crassifolia*. Other species present are native broom, matagouri, poataniwha, gorse* (rare), sweet brier*, flowering currant*, native convolvulus, lawyer, leafless lawyer, scrub pohuehue, mistletoe (on *Coprosma propinqua* and *Coprosma crassifolia*), silver tussock, mountain kiokio and bracken.

Birds/Fauna Observed:
Native birds observed during this brief survey were grey warbler and bellbird.

Notable Flora, Fauna and Habitats:
Important features of this area are the presence of indigenous woody vegetation on basalt and the habitat the area provides for forest birds.

Notable Plant and Animal Pests:
Sycamore and flowering currant are the most important plant pests present. Other plant pests present do not pose a significant threat to the forest. Animal pests were not surveyed, though possum sign was observed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):
This area is well buffered by its location on steep rocky slopes. It is surrounded by pasture with scattered shrubland, except at its eastern boundary where it adjoins pine forest. It lies relatively close to other areas of indigenous forest and shrubland.

Condition and Management Issues:
This small area of forest is in relatively good condition. The main management issue is plant and animal pest control. Protection from grazing would also benefit the forest.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	A good example of indigenous forest typical of such sites in the ecological district.
Rarity	M	Indigenous vegetation on basalt is an uncommon plant community.
Diversity and pattern	M	A relatively diverse range of plant species is present, though diversity is probably reduced from that formerly present.
Distinctiveness/special features	L/M	The presence of large basalt boulders is a distinctive feature.
Other Criteria		
Size/shape	M	A relatively small area, though with a reasonable shape and well buffered.
Connectivity	M	Linked to other nearby areas of indigenous vegetation by shrubland.
Long-term Sustainability	M	Some plant and animal pest control 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 area is naturally protected by its location on boulder 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 woody vegetation on basalt and the habitat the area provides for forest birds.

TIMARU DISTRICT SNA SURVEY SNA 553a

Area Name: Main Cave Hill Gully
Location (central map reference): J39: 527-441
Ecological District: Waimate
Surveyors: Mike Harding
Property: Peter and Jane Evans
Nearest Locality: Evans Crossing
Area Size (ha): 3.3 **Altitude (m):** 120-150
Survey Time: 1 hour **Survey Date:** 16-12-10

General Description:

This SNA lies at the lower end of a large gully draining the southeast slopes of Cave Hill. The lower part of the area is close to the Pareora River. The upper part of the area adjoins a larger area on an adjoining property. This SNA is part of one the largest areas of indigenous vegetation remaining in this part of Waimate Ecological District.

Plant Communities:

Two main plant communities are present: low-stature hardwood forest and regenerating hardwood forest/scrub. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Hardwood Forest:

The forest canopy is dominated by broadleaf and matipo. Kowhai is dominant along the stream. Other canopy species are lancewood, cabbage tree, mountain akeake, elderberry*, pohuehue, bush lawyer and lawyer.

Understorey species are *Coprosma crassifolia*, *Coprosma propinqua*, korokio, matipo, broadleaf, lawyer and pohuehue.

Ground-cover species are common shield fern, *Asplenium appendiculatum*, hound's tongue fern, male fern*, blackberry*, hookgrass, *Senecio wairauensis*, *Dichondra repens* and seedlings of broadleaf, matipo, cabbage tree, native jasmine, and *Coprosma* species.

Species commonly present at the forest margin are native convolvulus, pohuehue, scrub pohuehue, bracken, korokio, Khasia berry*, *Coprosma crassifolia*, *Coprosma propinqua*, koromiko, kowhai, matipo, lancewood, native broom, scrambling fuchsia, hybrid fuchsia, blackberry*, foxglove*, necklace fern, *Asplenium richardii*, male fern*, Scotch thistle*, Californian thistle*, nodding thistle*, burdock*, woolly mullein* and bidibid. One patch of the threatened (nationally endangered) scrambling broom (*Carmichaelia kirkii*) is present at the forest/scrub margin beside the vehicle track.

Additional species present close to the stream are crack willow*, marbleleaf, five-finger, bush lily, bittersweet*, *Blechnum chambersii*, *Blechnum fluviatile*, swamp kiokio, hanging spleenwort, *Hypolepis ambigua*, pennywort, *Cardamine debilis*, star lily, hemlock* and creeping buttercup*.

Scrub:

This community is dominated in most places by gorse*. Other important species are lawyer, scrub pohuehue, pohuehue, *Coprosma propinqua*, mountain akeake, broom* and bracken, with emergent matipo, broadleaf, lancewood, korokio, *Coprosma crassifolia* and cabbage tree. There are patches of Khasia berry* and emergent kanuka trees within this scrub community on the adjacent property.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, grey warbler, welcome swallow, shining cuckoo, kereru, rifleman, silvereye, brown creeper and fantail.

Notable Flora, Fauna and Habitats:

Important features of this area are the extent of the area (it is part of a much larger area), the presence of a nationally-endangered plant species (*Carmichaelia kirkii*), the presence of an at-risk (declining) bird species

TIMARU DISTRICT SNA SURVEY SNA 554a

Area Name:
Location (central map reference): J39: 522-440
Ecological District: Waimate
Surveyors: Mike Harding

Property: Peter and Jane Evans
Nearest Locality: Evans Crossing
Area Size (ha): 0.97 **Altitude (m):** 170-210
Survey Time: ½ hour **Survey Date:** 16-12-10

General Description:

This SNA lies on the steep slopes of a deeply-incised gully, at the property boundary above the Pareora River.

Plant Communities:

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

The forest canopy here is dominated by lancewood. Other canopy species are kowhai, broadleaf, cabbage tree, pohuehue, lawyer, native convolvulus and *Parsonsia capsularis*.

The steepness of the site prevented a detailed survey of the forest understorey. However, species observed in the understorey at the forest margin, or at open sites along the stream, were elderberry*, prickly shield fern, male fern*, bush lily, foxglove* and *Dichondra repens*.

Dense shrubland and scrub are present at the forest margin. Species here are mountain akeake, *Coprosma propinqua*, *Coprosma crassifolia*, matagouri, native broom, korokio, scrub pohuehue, lawyer, and, at the lower margin, broom*.

(rifleman), the diversity of the forest bird fauna and the contribution the area makes to forest bird habitat in the wider area.

Notable Plant and Animal Pests:
Gorse and broom are the most extensive plant pests present. Large patches of Khasia berry (*Cotoneaster simonsii*) are present on the adjacent property. Elderberry, crack willow and blackberry are also common. Of these, Khasia berry poses the greatest threat as birds can disperse its fruits over wide distances. Crack willow threatens stream-side habitats. Gorse, though widespread, is playing a useful role here as a nurse-crop for regenerating indigenous plants. Animal pests were not surveyed, though three wallabies were seen during this short survey.

Boundaries (buffering, fencing, adjoining plant communities and habitats):
This area is well buffered by its location in a deep gully and by the extensive gorse scrub at its boundaries. It is part of a much larger area of indigenous vegetation which extends up-valley onto the adjacent property.

Condition and Management Issues:
The forest canopy appears to be in relatively good condition. The forest understorey is open where it is accessible to browsing animals. The most important management issues are control of wallabies and Khasia berry and protection of the forest and the scrub margin from clearance (fire or spraying).

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	**M**	A very good example of regenerating indigenous vegetation.
Rarity	**H**	Supports a population of a nationally-endangered plant species (*Carmichaelia kirkii*) and an 'at-risk' bird species (rifleman).
Diversity and pattern	**M**	Species diversity moderate, though probably reduced from that originally present.
Distinctiveness/special features	**M**	The extent of the scrub margin and healthy regeneration of indigenous species within that scrub is a special feature.
Other Criteria		
Size/shape	**M/H**	A relatively large area for this part of the ecological district, and part of a much larger area.
Connectivity	**M/H**	Adjoins a more extensive area of indigenous vegetation and makes an important contribution to fauna habitat in the wider area.
Long-term Sustainability	**M/H**	Control of invasive plant and animal pests 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 is well protected by its location and extensive scrub margin. It has limited potential for farm development. A farm track traverses the area.

Discussion:
This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the extent of the area (it is part of a much larger area), the presence of a nationally-endangered plant species (*Carmichaelia kirkii*), the presence of an at-risk (declining) bird species (rifleman), the diversity of the forest bird fauna and the contribution the area makes to forest bird habitat in the wider area.

Birds/Fauna Observed:
Native birds observed during this brief survey were grey warbler and brown creeper.

Notable Flora, Fauna and Habitats:
Important features of this area are the dominance of lancewood in the forest canopy and the steepness of the site.

Notable Plant and Animal Pests:
A dense infestation of broom is present at the lower boundary (on the adjacent property). No other significant plant or animal pests were observed during this brief inspection, though possums are likely to be present.

Boundaries (buffering, fencing, adjoining plant communities and habitats):
This area is very well protected by its location in a steep incised gully. It lies downstream from other areas of indigenous vegetation (SNAs 555c and d) and relatively close to a larger area of indigenous vegetation (SNA 553).

Condition and Management Issues:
Vegetation of this area appears to be in good condition, though is presumably regenerating from former disturbance. It is likely to continue to improve (regenerate) with little management except perhaps animal pest control.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	An example of regenerating forest typical of the ecological district.
Rarity	L	No rare or uncommon species were observed.
Diversity and pattern	L/M	Plant diversity appears relatively low.
Distinctiveness/special features	M	The dominance of lancewood is an interesting feature.
Other Criteria		
Size/shape	M	A relatively small area but very well buffered by its location.
Connectivity	M	Lies reasonably close to other areas of indigenous vegetation.
Long-term Sustainability	M	Some animal pest control may be required to maintain ecological values in the long term.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
The steepness of the site makes this area unsuitable for further farm development.

Discussion:
This area only just meets the District Plan criteria for a Significant Natural Area. Important features of the area are dominance of lancewood in the forest canopy and the contribution it makes to fauna habitat in the wider area.

TIMARU DISTRICT SNA SURVEY SNAs 555a, b and c

Area Name: Cave Hill south
Ecological District: Waimate
AREA 555a: Location (central map ref.): J39: 512-447
AREA 555b: Location (central map ref.): J39: 516-448
AREA 555c: Location (central map ref.): J39: 519-451
Surveyors: Mike Harding

Property: Peter and Jane Evans
Nearest Locality: Evans Crossing
Area Size (ha): 3.68 **Altitude (m):** 300-400
Area Size (ha): 2.96 **Altitude (m):** 300-380
Area Size (ha): 6.7 **Altitude (m):** 300-400
Survey Time: 2½ hours **Survey Date:** 16-12-10

General Description:

These three SNAs lie in small adjacent gullies on the southern slopes of Cave Hill in the northern part of Waimate Ecological District. They occupy moderately-steep to steep slopes on rocky ground. They are described together here because they have similar ecological values.

Plant Communities:

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

Western gully, SNA 555a:

The forest canopy here is dominated by broadleaf, narrow-leaved lacebark and mahoe. Other canopy species are marbleleaf, cabbage tree, lancewood, five-finger, matipo, fuchsia, pohuehue and bush lawyer.

The forest understorey is, in most parts, very open. Species present, mostly alongside the stream, are *Coprosma crassifolia*, *Coprosma propinqua*, lancewood (rare), elderberry*, pate, narrow-leaved lacebark, black nightshade*, native jasmine, bush lawyer and, on tree trunks, hound's tongue fern and hanging spleenwort.

Ground-cover species present are necklace fern, *Asplenium hookerianum*, hanging spleenwort, thousand-leaved fern (rare), *Hypolepis ambigua*, prickly shield fern, common shield fern, hound's tongue fern, *Pellaea rotundifolia*, *Blechnum fluviatile*, *Blechnum chambersii*, male fern*, bush lily (rare), pennywort, *Oxalis* sp., foxglove*, burdock* (rare), *Cardamine debilis*, cleavers* and seedlings of mahoe, marbleleaf, cabbage tree and *Coprosma* species.

Species present at the forest margin are *Coprosma propinqua*, *Coprosma crassifolia*, elderberry*, native broom, scrambling fuchsia, prickly shield fern, necklace fern, foxglove* and, at a damper area at the upper margin of the site, *Carex coriacea*, *Juncus gregiflorus* and Maori onion.

Central gully, SNA 555b:

This area of forest was not surveyed in detail; instead it was viewed from the upper margin. The forest canopy is dominated by marbleleaf and broadleaf. Other canopy species present are mahoe, kowhai, mapou, cabbage tree, lancewood and pohuehue. Species present at the forest margin are *Coprosma propinqua*, *Coprosma crassifolia*, matagouri, mountain akeake, mountain flax and bush lawyer. The forest interior is likely to be similar to that in SNAs 555a and 555c.

Eastern gully, SNA 555c:

The canopy of this area of forest is dominated by mahoe, broadleaf, marbleleaf and, at the forest margin, kowhai. Other canopy species present are lancewood, five-finger, pohuehue and native convolvulus. Trunk diameters (at breast height) of the larger marbleleaf trees are 40-45cm; and lancewood trees, 30-35cm.

The forest understorey is very open. Species present are elderberry*, bush lawyer, mahoe, *Coprosma crassifolia*, *Coprosma rigida*, pohuehue, and, on tree trunks, hound's tongue fern. One large bush of tree nettle (*Urtica ferox*) was observed.

The forest floor is also relatively open. Ground cover species are prickly shield fern, common shield fern, *Asplenium hookerianum*, *Asplenium richardii*, necklace fern, hen and chickens fern, *Pellaea rotundifolia*, *Blechnum fluviatile*, *Blechnum penna-marina*, hound's tongue fern, pennywort, hairy pennywort, bush lily (rare), star lily, bidibid, selfheal*, *Oxalis* sp., *Ranunculus* sp., wall lettuce*, foxglove* and seedlings of kowhai, fuchsia, broadleaf, native jasmine and *Coprosma* species. Species present at damper sites are *Blechnum chambersii* and *Hypolepis ambigua*.

Species present at the forest margin and/or forest openings are *Coprosma propinqua*, *Coprosma tayloriae*, fuchsia, hybrid fuchsia, poroporo, scrub pohuehue, foxglove*, Maori onion, narrow-leaved snow-tussock and silver tussock. A patch of tall radiata pine* trees is present at the upper edge of the site.

Dense shrubland and scrub are present at the western part of this site. This plant community is dominated by matagouri, *Coprosma propinqua* and *Coprosma crassifolia*. Other species present are broadleaf, lancewood, mahoe, mapou, cabbage tree, marbleleaf, native broom, mistletoe (on *Coprosma crassifolia*), scrambling fuchsia, native convolvulus, scrub pohuehue, pohuehue, *Parsonsia capsularis*, bush lawyer, Maori onion, bracken, *Elymus solandri*, silver tussock, blue tussock, narrow-leaved snow-tussock, fescue tussock, necklace fern, mountain kiokio and hound's tongue fern.

SNA 555c

Birds/Fauna Observed:
Native birds observed during this survey were bellbird, grey warbler, fantail, kereru and brown creeper.

Notable Flora, Fauna and Habitats:
Important features of these areas are the extent of the forest habitat, the presence of locally-uncommon plant species (tree nettle and thousand-leaved fern) and the habitat the areas provide for forest birds.

Notable Plant and Animal Pests:
These areas of forest are relatively free of invasive plant pests. Elderberry and agricultural weeds (such as burdock) are present but do not pose a significant threat to the forest. The smothering native climber, pohuehue (*Muehlenbeckia australis*), is also present. Animal pests were not surveyed, though several wallabies were observed and the forest understorey is substantially depleted.

Boundaries (buffering, fencing, adjoining plant communities and habitats):
These three areas are well buffered by their locations in steep-sided gullies and are connected by areas of shrubland, scrub and rough pasture. They lie close to a substantially larger area of indigenous vegetation in a valley to the east (SNA 553). The areas are not fenced and are readily accessible to stock.

Condition and Management Issues:
The forest canopy at each area is in relatively good condition, though the forest understoreys are depleted. The most important management issues are removal of wallabies and protection of the forest understorey from domestic stock (though fencing these forest boundaries would be difficult).

Property Owner Comment:
Shrubland/scrub regeneration has been good in this area. The forest appears to be recovering though the understorey is affected, especially by wallabies.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	**M**	Good examples of indigenous forest and shrubland/scrub typical of the ecological district.
Rarity	**M**	Supports populations of locally uncommon plant species and probably provides habitat for an 'at risk' bird species (rifleman).
Diversity and pattern	**L/M**	Species diversity is lower than average for this forest type and substantially reduced from that originally present.
Distinctiveness/special features	**L/M**	The presence of healthy shrubland margins with forest regeneration is a feature.
Other Criteria		
Size/shape	**M/H**	Moderate sized areas that are narrow but well buffered.
Connectivity	**M**	These areas lies close to one another and to another larger area of indigenous vegetation, and contribute to the network of forest bird habitat in the wider area.
Long-term Sustainability	**M**	Improved regeneration of canopy species will be necessary to ensure protection of ecological values in the long term.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
These three areas of forest and shrubland are protected by their locations in steep and relatively inaccessible gullies. The occupy sites that have little potential for further farm development.

Discussion:
These areas meet the District Plan criteria for Significant Natural Areas. Important features of the areas are the extent of the forest habitat, the presence of locally-uncommon plant species (tree nettle and thousand-leaved fern) and the habitat the areas provide for forest birds.

TIMARU DISTRICT SNA SURVEY SNA 555d

Area Name: Cave Hill south scrub
Location (central map reference): J39: 521-447
Ecological District: Waimate
Surveyors: Mike Harding
Property: Peter and Jane Evans
Nearest Locality: Evans Crossing
Area Size (ha): 1.65 **Altitude (m):** 280-320
Survey Time: 1 hour **Survey Date:** 16-12-10

General Description:

This SNA lies on moderately-steep rocky west-facing slopes of a gully on the south side of Cave Hill. It lies down-valley and close to an area of indigenous forest (SNA 555c).

Plant Communities:

A mosaic of plant communities is present. These are described below. Naturalized (exotic) species are indicated with an asterisk*.

This site supports a relatively extensive mosaic of shrubland, scrub, forest patches and rockland among pasture. Important species are matagouri, *Coprosma propinqua*, scrub pohuehue, broadleaf and mahoe. Other tree species present are kowhai, lancewood, cabbage tree, fuchsia and mapou.

Other shrubland species present are *Coprosma crassifolia*, *Coprosma tayloriae*, *Coprosma virescens*, korokio, matipo, native broom, mistletoe (on *Coprosma crassifolia*), *Clematis marata*, scrambling fuchsia, leafless lawyer, bush lawyer, lawyer and native convolvulus.

Species present at rocky sites are *Asplenium appendiculatum*, mountain flax, porcupine shrub, black nightshade*, *Dichondra repens*, *Geranium* sp., *Cardamine debilis*, *Einadia allanii*, *Wahlenbergia gracilis*, star lily, hairy pennywort, *Rytidosperma* sp., *Elymus solandri*, necklace fern, *Oxalis* sp. and *Helichrysum filicaule*.

One damp rocky site, inaccessible to stock, supports *Libertia ixioides*, *Brachyglottis bellidioides*, *Anisotome aromatica* var. *major*, *Gaultheria antipoda* and hanging spleenwort.

Additional native species scattered through the pasture are narrow-leaved snow-tussock, silver tussock, blue tussock, bracken, *Juncus distegus* and *Anisotome aromatica*.

Birds/Fauna Observed:

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

Notable Flora, Fauna and Habitats:

Important features of this area are the number of locally-uncommon plant species present (*Anisotome aromatica* var. *major*, *Brachyglottis bellidioides*, *Coprosma virescens*, *Gaultheria antipoda*, *Helichrysum filicaule*, porcupine shrub and *Wahlenbergia gracilis*) and the proximity of the area to a larger area of indigenous forest.

Notable Plant and Animal Pests:

No significant plant or animal pests were observed, though wallabies are present in the area.

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

This loosely-defined area is buffered by its location on steep rocky slopes. It lies close to other areas of indigenous vegetation (SNAs 555 and 553).

Condition and Management Issues:

Parts of the area that are inaccessible to stock (rocky bluffs and dense scrub) provide habitat for the locally-uncommon species present. Better protection from grazing animals (and animal pests) may allow population expansion of uncommon species and regeneration of indigenous woody vegetation.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	Rock bluff flora is representative of that originally present at such sites; other parts of the area are less representative though typical of sites remaining in the ecological district.
Rarity	M	Supports a good number of locally-uncommon plant species, several of which have not yet been recorded in this part of Timaru District during the SNA survey.
Diversity and pattern	M	A relatively high number of indigenous species (47) were recorded at the site; higher than average for SNAs in this area.
Distinctiveness/special features	M	The mosaic of forest, scrub, shrubland and rock-bluff flora is a special feature.
Other Criteria		
Size/shape	M	A moderate-sized area with a good shape but not well buffered.
Connectivity	M	Lies close to other areas of indigenous vegetation.
Long-term Sustainability	M	Ecological values at the site will probably continue to gradually improve, but the site is vulnerable to grazing and wild animals.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):
This SNA occupies steep rocky slopes that are probably unsuitable for further farm development.

Discussion:
This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of seven locally-uncommon plant species, the mosaic of plant communities and the proximity of the area to a larger area of indigenous forest.

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
bidibid	*Acaena* sp.
bittersweet*	*Solanum dulcamara*
blackberry*	*Rubus fruticosus*
black nightshade*	*Solanum nigrum*
blue tussock	*Poa colensoi*
bracken	*Pteridium esculentum*
broadleaf	*Griselinia littoralis*
broom*	*Cytisus scoparius*
burdock*	*Arctium minus*
bush lawyer	*Rubus cissoides*
bush lily	*Astelia fragrans*
cabbage tree/ti rakau	*Cordyline australis*
Californian thistle*	*Cirsium arvense*
cleavers*	*Galium aparine*
cocksfoot*	*Dactylis glomerata*
common shield fern	*Polystichum richardii*
crack willow*	*Salix fragilis*
creeping buttercup*	*Ranunculus repens*
creeping pohuehue	*Muehlenbeckia axillaris*
dandelion*	*Taraxacum officinale*
dwarf mistletoe	*Korthalsella lindsayi*
elderberry*	*Sambucus nigra*
fescue tussock	*Festuca novae-zelandiae*
five-finger	*Pseudopanax arboreus*
flowering currant*	*Ribes sanguineum*
foxglove*	*Digitalis purpurea*
fuchsia	*Fuchsia excorticata*
gooseberry*	*Ribes uva-crispa*
gorse*	*Ulex europaeus*
hairy pennywort	*Hydrocotyle moschata*
hanging spleenwort	*Asplenium flaccidum*
hemlock*	*Conium maculatum*
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*
leather-leaf fern	*Pyrrosia eleagnifolia*
mahoe/whiteywood	*Melicytus ramiflorus*
male fern*	*Dryopteris filix-mas*
Maori onion	*Bulbinella angustifolia*
mapou	*Myrsine australis*
marbleleaf/putaputaweta	*Carpodetus serratus*
matagouri	*Discaria toumatou*
matipo/kohuhu	*Pittosporum tenuifolium*

mistletoe	*Ileostylis micranthus*
mountain akeake	*Olearia avicenniifolia*
mountain flax	*Phormium cookianum*
mountain kiokio	*Blechnum montanum*
mouse-ear hawkweed*	*Hieracium pilosella*
narrow-leaved lacebark	*Hoheria angustifolia*
narrow-leaved plantain*	*Plantago lanceolata*
narrow-leaved snow-tussock	*Chionochloa rigida*
native broom	*Carmichaelia* aff. *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.
poataniwha	*Melicope simplex*
pohuehue	*Muehlenbeckia australis*
porcupine shrub	*Melicytus alpinus*
poroporo	*Solanum laciniatum*
prickly shield fern	*Polystichum vestitum*
purging flax*	*Linum catharticum*
radiata pine*	*Pinus radiata*
Scotch thistle*	*Cirsium vulgare*
scrambling broom	*Carmichaelia kirkii*
scrambling fuchsia	*Fuchsia perscandens*
scrub pohuehue	*Muehlenbeckia complexa*
selfheal*	*Prunella vulgaris*
silver tussock	*Poa cita*
star lily	*Arthropodium candidum*
stonecrop*	*Sedum acre*
storksbill*	*Erodium cicutarium*
swamp kiokio	*Blechnum minus*
sweet brier*	*Rosa rubiginosa*
sycamore*	*Acer pseudoplatanus*
thousand-leaved fern	*Hypolepis millefolium*
toatoa	*Haloragis erecta*
totara	*Podocarpus totara*
tree nettle	*Urtica ferox*
velvety nightshade*	*Solanum chenopodioides*
wall lettuce*	*Mycelis muralis*
wineberry	*Aristotelia serrata*
woolly mullein*	*Verbascum thapsus*