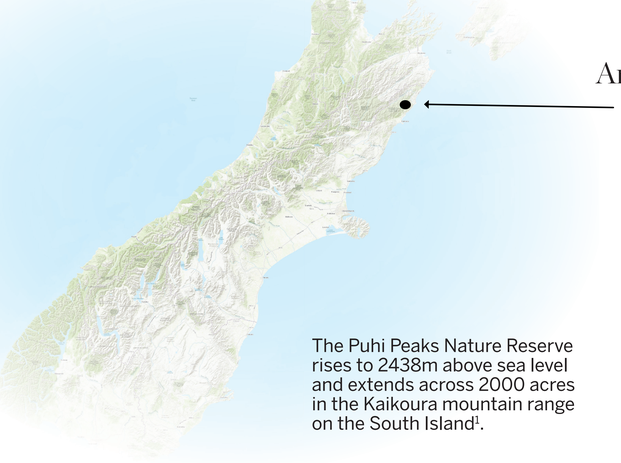


The Puhi Peaks Nature Reserve rises to 2438m above sea level and extends across 2000 acres in the Kaikoura mountain range on the South Island[1].

An assessment of the current state of native vegetation on the **Puhi Peaks Nature Reserve**, **Kaikoura**, to further improve biodiversity conservation efforts

ALISON HARFORD AND DENISE LELLO

DRAFTING A **BIODIVERSITY STRATEGY** FOR **PRIVATE LAND**

UC UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

SYRACUSE UNIVERSITY
SUOS CULTORES SCIENTIA CORONAT
FOUNDED 1870

INTRODUCTION AND METHODS

CURRENT STATE OF CONSERVATION

Tension exists between property conservation goals and maintenance of business operations.

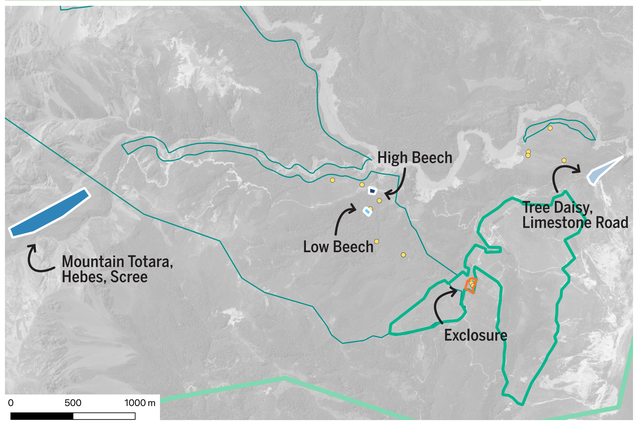
The property's conservation goals are managed through pasture fencing, to contain livestock, deer fencing, to contain deer for hunting, an exclosure, designed to exclude any grazing mammals such as deer, feral goats, and wild sheep, and established photo points.

Land use on the property currently includes pastoral farming and eco-tourism operations such as tramping and hunting. Stock and feral animals present on the property, such as red deer, goats, sheep and pigs, are preventing regeneration of native forest in most of the open land[2], as they browse seedlings and saplings.

The purpose of this project is to assess the current state of remnant habitat and native vegetation on the property and to establish monitoring locations and protocols for assessing the status of native forest remnants on the property. This involved two undertakings:

1. Identifying forest types and assets on the property by setting up transect monitoring on eight sites
2. Suggestions for establishing permanent fencing and monitoring protocols at biodiversity "strength" sites, or sites of unique habitats or plant species

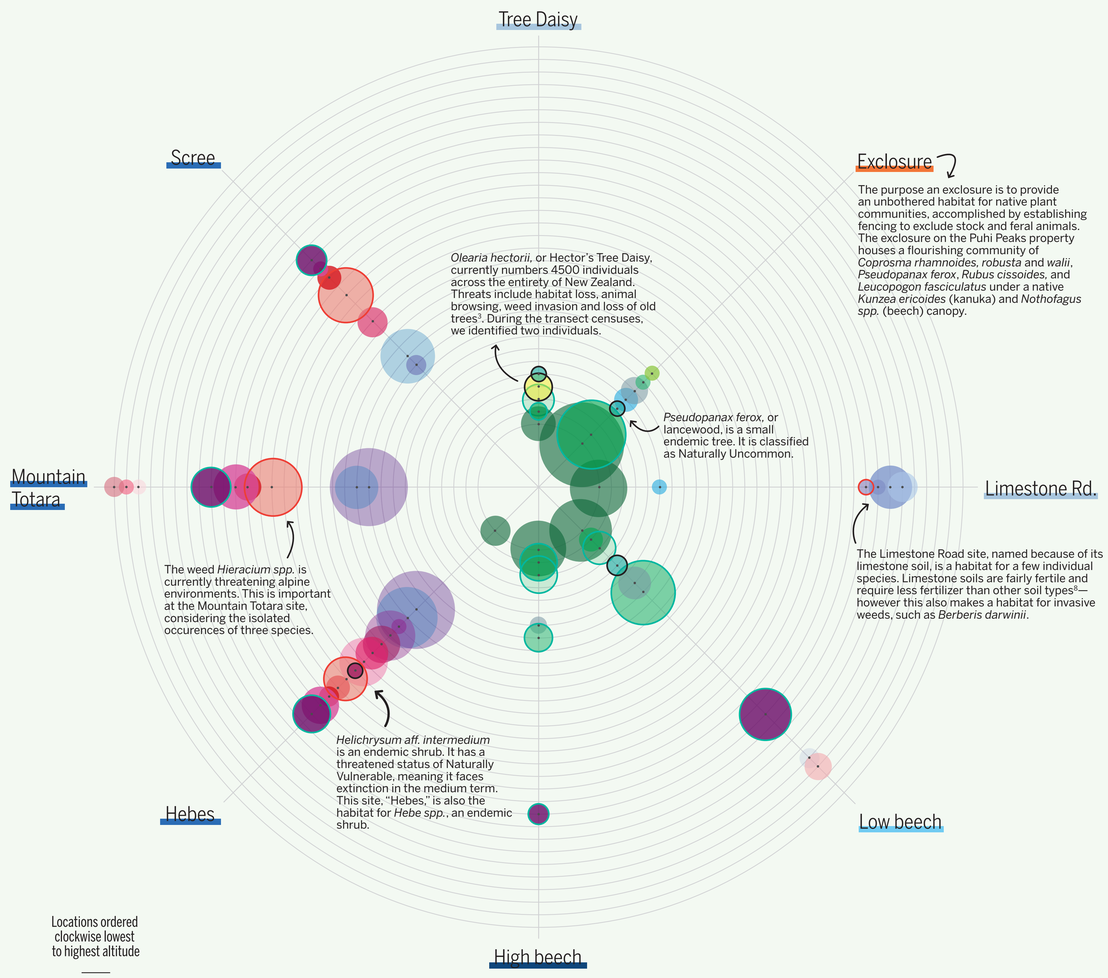
SOUTH-EAST EDGE OF THE PROPERTY: CURRENT LAND USE AND TRANSECT SITES



Eight sites (**"Mountain Totara"**) chosen throughout the property to assess different altitude and soil environments were censused using two 20m transects, measured using a tape measure. At each meter, the following data within two meters on either side of the tape measure was collected: canopy cover, the presence of grass and/or forb and native plant or invasive weed identification.

RESULTS

ANALYZING PROPERTY STRENGTHS



DISCUSSION AND CONCLUSION

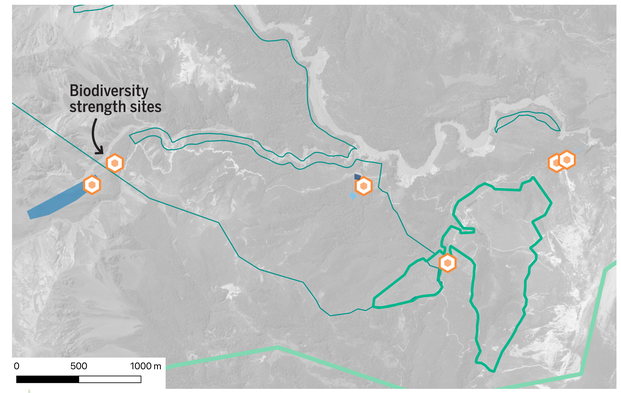
RECOMMENDATIONS

In data analysis, the following biodiversity strengths, some illustrated in the figure to the left, of the property were identified. Starting from the west and continuing east:

- The *Helichrysum aff. intermedium* alpine community
- Site of the Hutton's Shearwater colony, one of two last living colonies[7], and site of the Shearwater Lodge, a lodge built by property owners as an eco-tourism attraction
- *Nothofagus spp.* (remnant Mountain Beech) and *Pseudopanax ferox* communities
- Established exclosure
- *Olearia hectorii* and *Pseudopanax macintyrei* communities
- Limestone soil habitat

Sites overlap with current photo points.

SITES OF PROPERTY BIODIVERTSITY STRENGTHS



Our recommendations for sustaining these sites come in two parts.

First, establish fencing around threatened plant communities at each site, to control weed invasion and grazing[3]. Multiple studies[4,5,6] have shown the effectiveness of fencing for prevention of interference from stock and feral animals, and in encouraging the sustenance and regeneration of native forest.

Second, establish a monitoring program to track the condition of vegetation. Monitoring should be done two steps. First, photo points should be utilized every month. Second, transect censes should be completed in a consistent way with this project, per recommendations by David Norton, a professor in the School of Forestry at the University of Canterbury. Two 20m transects should be taken within fencing and outside of fencing at each site. This makes a total of 24 permanent transects. At each meter along the transect, the following conditions should be noted: latitude and longitude of meter one and meter twenty; plant identification, height, diameter, and evidence of browsing; the understory and percentage cover of ferns, forb, weeds; and the identification and percentage cover of overhead canopy. Transect monitoring should be done every six months: Our study was conducted in January, and so the next should be completed in July.

When evaluated, data can be used to determine if other measures, such as pest or weed control or supplimental planting, could be taken to guarantee the sustenence of native plant communities and regenerating native forest.

REFERENCES

[1]Puhi Peaks Kaikoura. Accessed May 2019. http://puhipeakskaikoura.nz/.
[2]Geoff Walls. "Puhi Peaks Station Biodiversity Management Strategy". Taramoa Ltd, Christchurch. August 2013.
[3]Department of Conservation. "Olearia hectorii factsheet". Southland Conservancy, Invercargill, 2007.
[4]David A. Norton, Jason Butt and David O. Bergin. "Upscaling restoration of native biodiversity: A New Zealand Perspective". Ecological Management & Restoration Vol 0, No 0 (April 2018). 1-10.
[5]David A. Norton and Jennifer Pannell. "Desk-top assessment of native vegetation on New Zealand sheep and beef farms". School of Forestry, University of Canterbury, Christchurch. June 2018.
[6]Matthew J. Kauffman and John L. Maron. "Consumers Limit the Abundance and Dynamics of Perennial Shrub with a Seed Bank". The American Naturalist Vo. 168 No. 4 (October 2006). 454-470.
[7]Hutton's Shearwater Charitable Trust. Accessed May 2019. http://www.huttonsshearwater.org.nz.
[8] Northland Regional Council. "Managing Northland Soils: Limestone Soils." n.d.