

Ecological Baseline Survey on the Depot, Saint Helena Island



View south-west from the summit of the Depot

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Mikko Paajanen (LEMP Ecologist)
Landscape and Ecological Mitigation Programme (LEMP)
Air Access Office
St Helena Government

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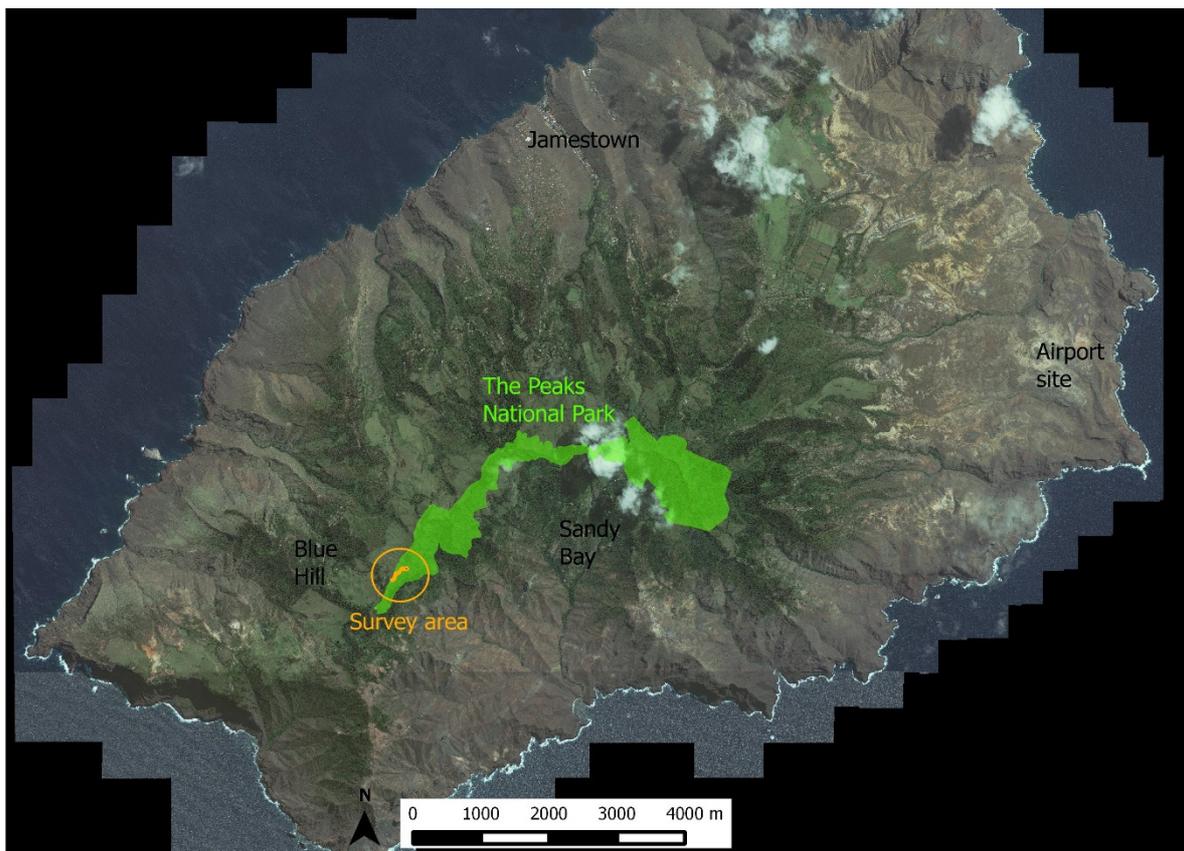
1. Introduction

This baseline survey was conducted for the planning application for a building on the Depot to allow for VHF radio coverage for airport communication. The survey is based on the given information that there will not be vehicular access in areas where there is no current vehicular access and the access to the summit of the Depot will be provided by improving the existing footpath.

The main purpose of this survey was to record endemic plant populations close to the access track and path to the Depot and in the proximity of the construction footprint on the summit of the hill. Photographic survey was also done to estimate the landscape impact of the development in the area. More detailed survey work has been carried out in the area previously by a Darwin funded IUCN red listing project (2013/14) but unfortunately this information was not available for this survey.

Depot is a hotspot for the endemic biodiversity on St Helena and is included in the Peaks National Park. Depot holds one of the two known populations of both large bellflower and *Sphagnum helenicum* on St Helena and in the world. It holds significant populations of toothed tongue fern, watch strap fern and small kidney fern and it is the only remaining place identified where *Huperzia insularis* survives on St Helena (Cairns-Wicks 2008, e-mail correspondence with Lourens Malan).

Map 1. Situation of the Depot survey area and the Peaks National Park on St Helena.



2. Survey Area

The survey area is the relatively easily accessible open area surrounding the estimated construction footprint on the summit of the Depot, two metres on the both sides of the footpath up to the summit and five meters on both sides of the current vehicular access track at the bottom of the hill.

Map 2. Survey area in relation to the path and Sure control building.

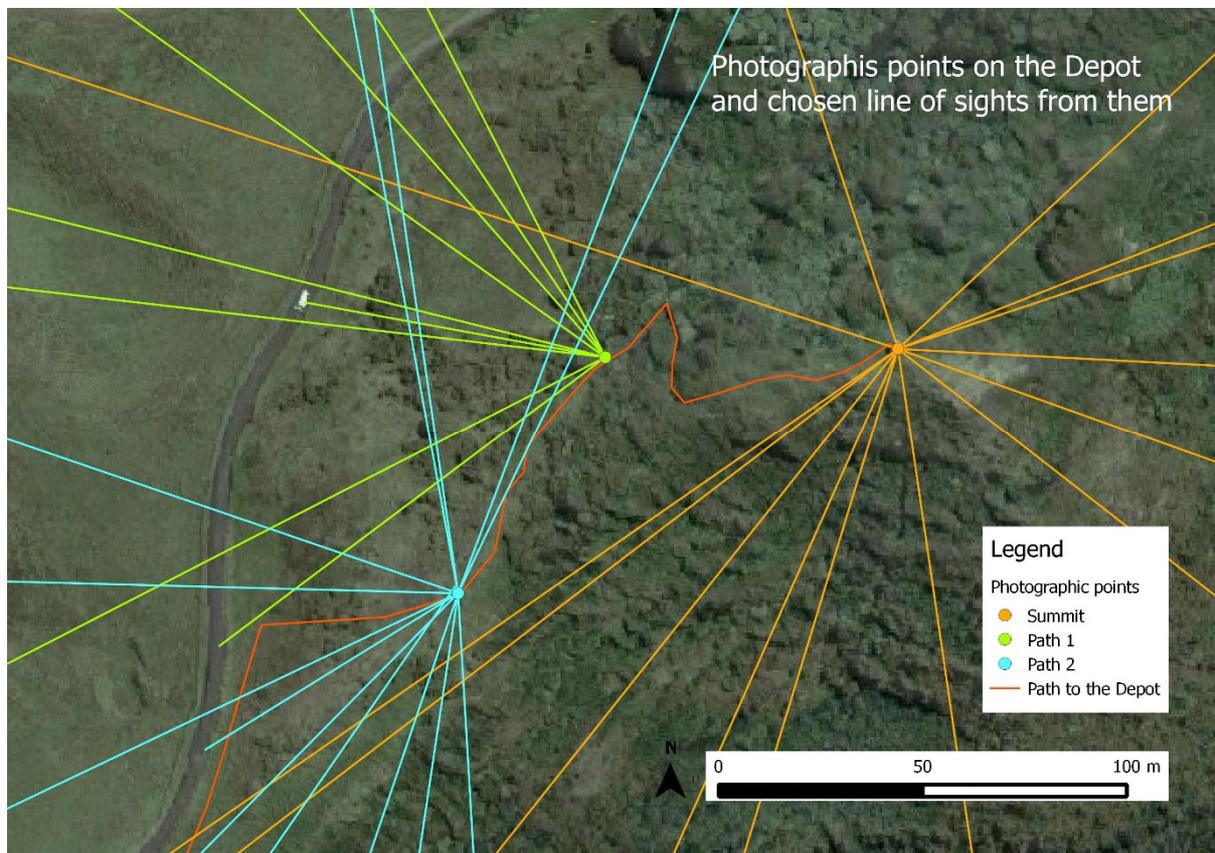


3. Methodology

The ecological survey was based on field observations in the survey area on 5.-7.1.2015. Field work took approximately two working days. GPS points were taken from endemic and native vascular plant species and some of the mosses. The accuracy of the GPS points is about 5 m, and they have been adjusted according to the satellite images available. All vascular plant species and some of the mosses and lichens in the survey area were recorded (see Appendix 1). Historical data on the invertebrate species (Appendix 2, table 1.) were sourced from the invertebrate database for St Helena (Pryce 2014). Some further observations were also made of the animals present in the survey area during the survey (Appendix 2, table 2.)

The photographic survey was based on taking photographs from three chosen points: at the summit of the Depot and two points along the footpath, to all compass directions. Based on these photographs line of sights were chosen to show on the Map 7.

Map 3. Situation of the photographic points on the summit of the Depot and along the path.



4. Results

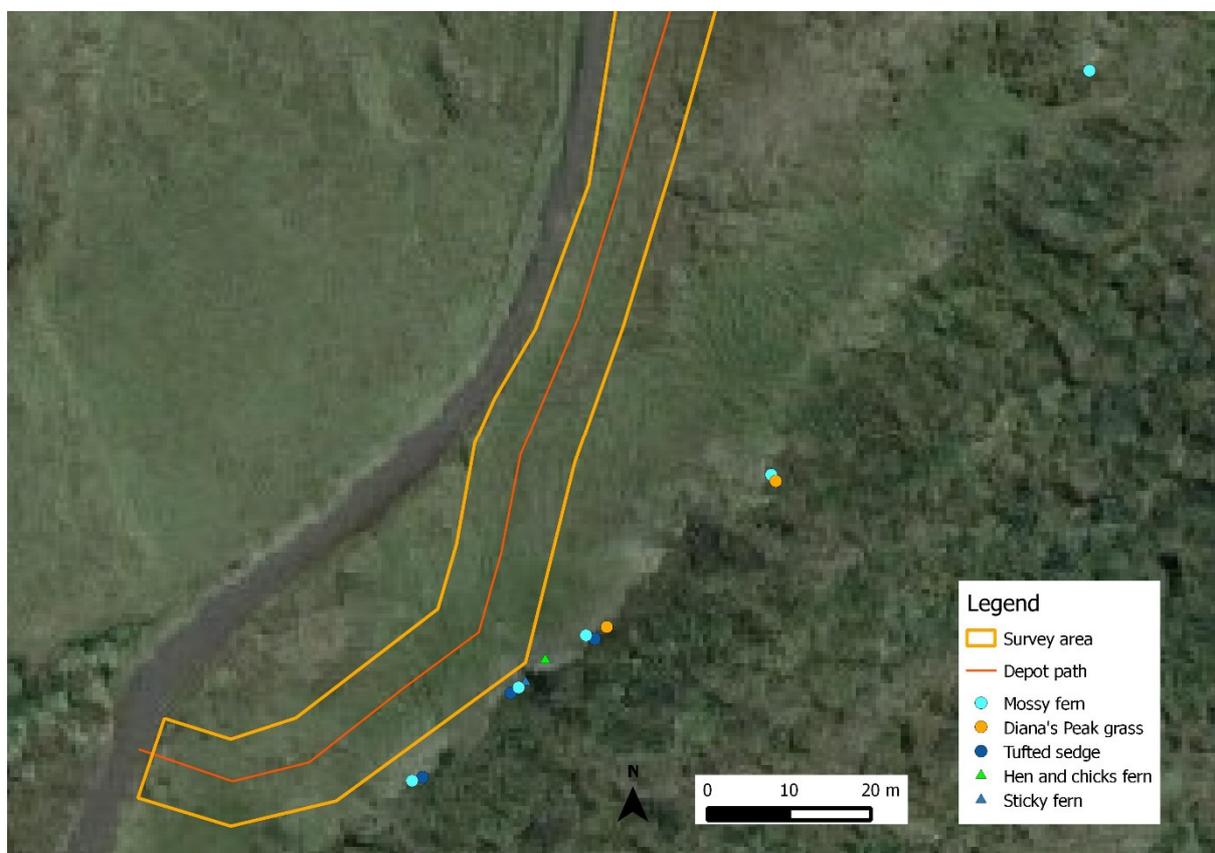
4.1 Ecological survey

Lists of plant and animal species can be found in Appendices 1 and 2.

Lower part of the survey area

The vehicular access track runs through a newly fenced sheep pasture. The pasture composes of two types of vegetation: grassy sward dominated by kikuyu and matt grass, and rocky outcrops with more diverse vegetation, including native mosses and lichens. No endemic vascular plant species were found from the lower parts of the survey area but several species were found growing just outside the sheep pasture on the verge of a cliff.

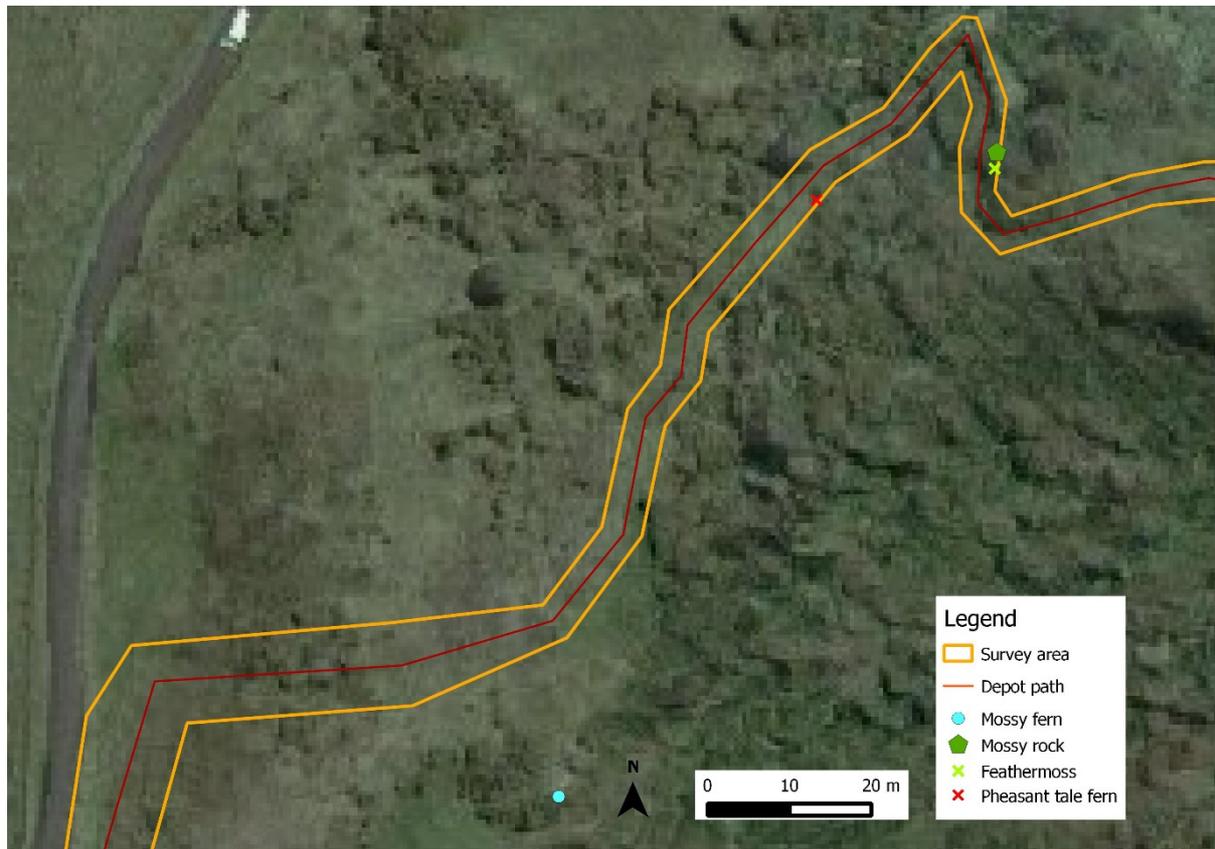
Map 4. Endemic and native vascular plants close to the bottom of the survey area. Endemic plants are indicated by circle and natives with a triangle.



Middle part of the survey area

The footpath to the Depot goes through newly fenced sheep pasture and scrubby vegetation. Native lichens and mosses are present in the area with also possible endemic mosses found, mostly growing on a rocky outcrop shaded by one big and several smaller Bermudan juniper trees. Highly invasive pheasant tale fern and invasive feather moss were also found growing on the side of the path.

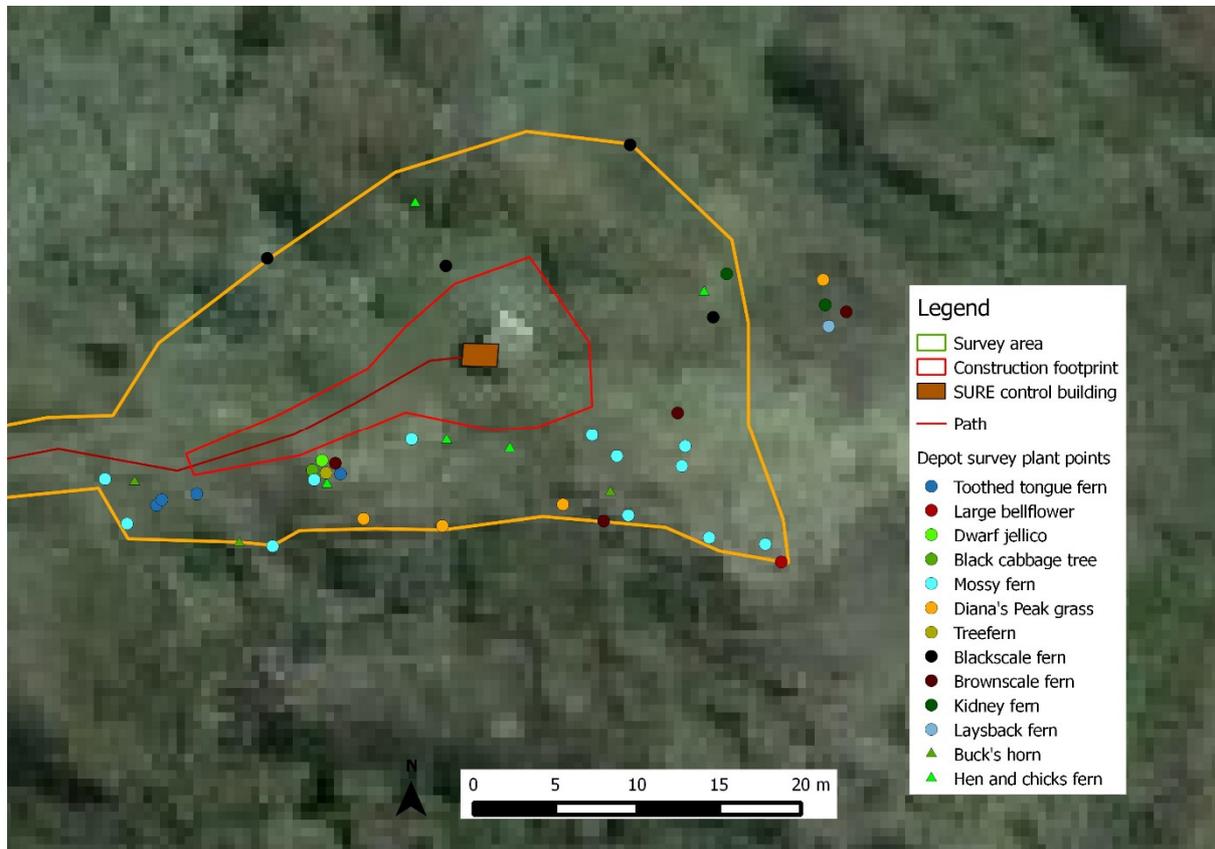
Map 5. Native and possibly endemic mosses indicated by hexagon, and invasive pheasant tale fern and feather moss indicated by crosses, next to the footpath up to the Depot.



Summit of the Depot

Summit of the Depot has several small populations of endemic and native plant species. Areas closest to the control room and along the access path are however dominated by kikuyu grass and smooth meadow grass. Native lichens and mosses can be found practically on all the rocky outcrops in the area.

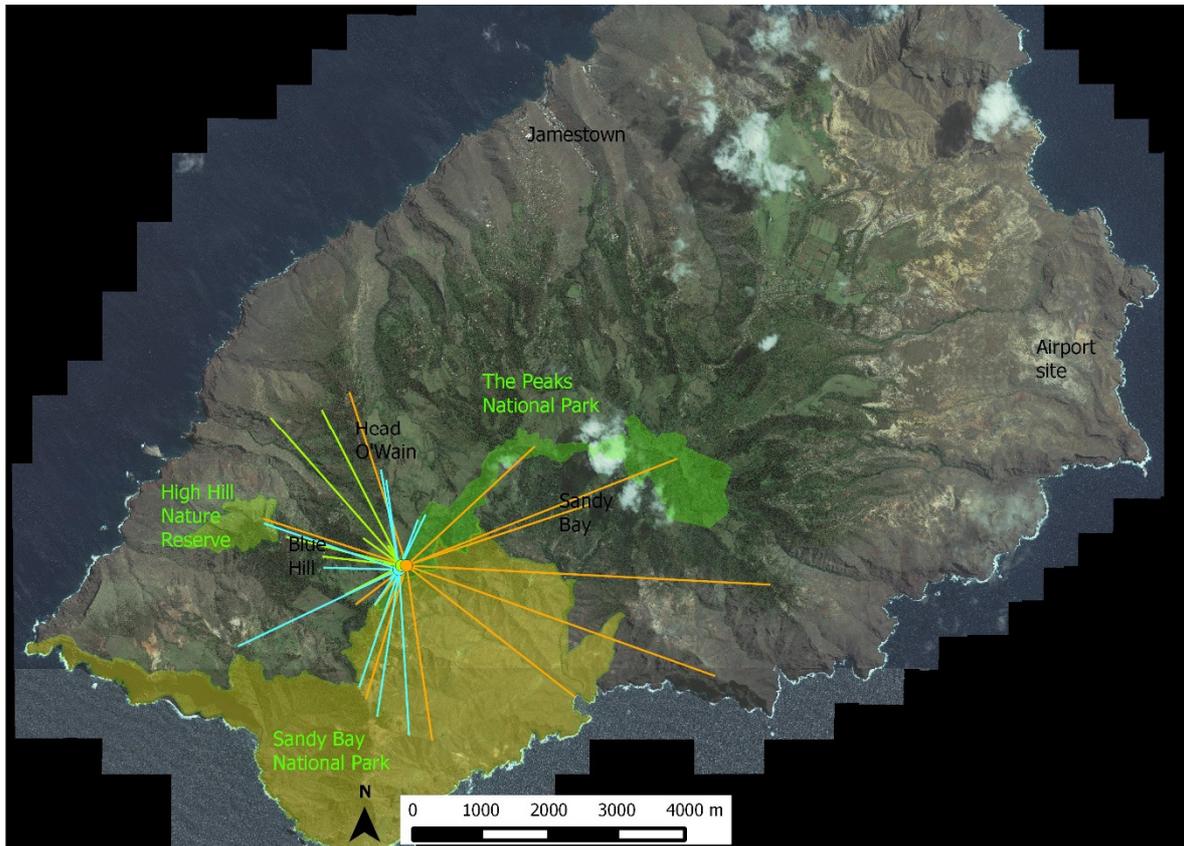
Map 6. Endemic and native plants on the summit of the Depot.



4.2 Photographic survey

The summit of the Depot and the footpath to the Depot are visible from a relatively large area on the south-western side of St Helena. The summit can be seen from Sandy Bay community and also from many areas in the Peaks National Park as well as the Sandy Bay National Park and High Hill Nature Reserve. The footpath area is visible to Blue Hill and Head o' Wain communities, Sandy Bay National Park and High Hill Nature Reserve.

Map 7. Line of sights from the three photographic points.



5. Conclusions and discussion

5.1 Ecological survey

Summit of the Depot is extremely important area for several of St Helena's endemic plant species. It is necessary to make certain that the construction activities have no impact on the populations of the endemic plant species on the summit of the Depot. On the side of the footpath one rocky outcrop shaded by Bermudan junipers seems to have interesting moss flora and thus may require some form of protection from the impact of the construction activities. On the sheep pastures areas dominated by kikuyu grass have very little value to the endemic biodiversity but on the other hand the grass is the main food source for the sheep in the pasture. Rocky outcrops in the pasture sustain several native lichen and moss species and should be left intact when possible.

5.2 Photographic survey

While not being a proper landscape survey the photographic points and lines of sight show that the Depot site is well visible from many places on the southern half of St Helena. Communities of Sandy Bay, Blue Hill and Head O'Wain have sight to either the Depot summit or the path leading to it. The area is also visible from many areas in the Peaks National Park and Sandy Bay National Park as well as from the High Hill nature reserve.

Great care needs to be taken to cause minimal damage to the landscape in the area and to upgrade the footpath and the building in a way that is visually acceptable in this area that is part of the Peaks National Park and thus under special conditions for any development.

6. Recommendations for minimizing the construction impact

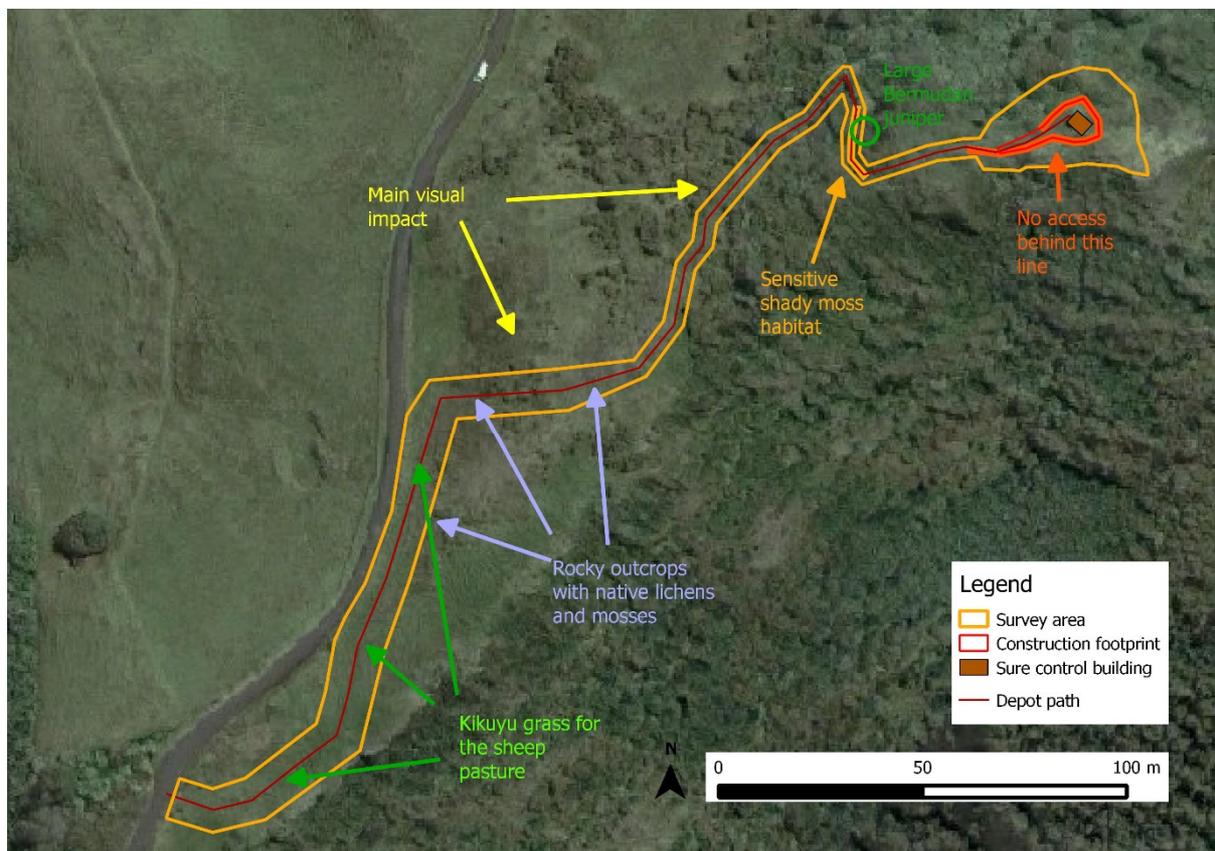
No-go-zone is recommended to be marked clearly on top of the Depot summit with an emergency line. All rubbish and external material needs to be taken out from all the areas after the works.

Large juniper and adjacent younger shrubbery is recommended to be left in place to protect a shady rocky outcrop with potentially endemic mosses growing on it. Upgrading the footpath in this area should be done so that it doesn't negatively impact the habitat.

Main visual impact will be on the side of the hill where the footpath will be upgraded. This should be done in a way that doesn't compromise the landscape values of the area. Well built wooden steps, similar to the ones at High Hill, could be a good possibility.

In the sheep pasture rocky outcrops accommodate variety of native lichen and moss species. These should be left intact when possible. Areas with kikuyu grass are the main feeding grounds for the sheep in the pasture so it is also recommended that no unnecessary disturbance should occur on these areas.

Map 8. Recommendations and things to take into account in the survey area



7. References

Cairns-Wicks R (co-ordinator) (2008). ***Protected Area Plan for the Central Peaks***. Project report for the Saint Helena National Trust and ANRD of Saint Helena Government.

Pryce D (2014 and on-going). Invertebrate database of St Helena. St Helena National Trust.

Appendix 1. Lists of plant species in the survey area

Table 1. Endemic and native species found during the survey

Functional group	Family	Common name	Scientific name	Nativity
Vascular plants	Apiaceae	dwarf jellico	<i>Berula burchellii</i>	Endemic
Vascular plants	Aspleniaceae	hen-and-chicks fern	<i>Asplenium lunulatum</i>	Native
Vascular plants	Asteraceae	black cabbage tree	<i>Melanodendron integrifolium</i>	Endemic
Vascular plants	Campanulaceae	large bellflower	<i>Wahlenbergia linifolia</i>	Endemic
Vascular plants	Cyperaceae	Diana's Peak grass	<i>Carex diana</i> var. <i>aequabilis</i>	Endemic
Vascular plants	Dennstaedtiaceae	sticky fern	<i>Hypolepis villosa-viscida</i>	Native
Vascular plants	Dicksoniaceae	tree-fern	<i>Dicksonia arborescens</i>	Endemic
Vascular plants	Dryopteridaceae	small kidney fern	<i>Dryopteris napoleonis</i>	Endemic
Vascular plants	Elaphoglossaceae	toothed tongue fern	<i>Elaphoglossum dimorphum</i>	Endemic
Vascular plants	Elaphoglossaceae	mossy fern	<i>Elaphoglossum furcatum</i>	Endemic
Vascular plants	Lycopodiaceae	buck's-horn	<i>Lycopodiella cernua</i>	Native
Vascular plants	Pteridaceae	lays back fern	<i>Pteris paleacea</i>	Endemic
Vascular plants	Thelypteridaceae	brown-scale fern	<i>Pseudophegopteris diana</i>	Endemic
Vascular plants	Woodsiaceae	black-scale fern	<i>Diplazium filamentosum</i>	Endemic
Vascular plants	Cyperaceae	tufted sedge	<i>Bulbostylis lichtensteiniana</i>	Endemic
Lichens	Cladoniaceae	<i>Cladonia marionii</i>	<i>Cladonia marionii</i>	Native
Lichens	Lobariaceae	<i>Pseudocyphellaria aurata</i>	<i>Pseudocyphellaria aurata</i>	Native
Lichens	Parmeliaceae	<i>Usnea leprosa</i>	<i>Usnea leprosa</i>	Native
Lichens	Parmeliaceae	<i>Parmotrema reticulatum</i>	<i>Parmotrema reticulatum</i>	Native
Lichens	Parmeliaceae	<i>Xanthoparmelia subramigera</i>	<i>Xanthoparmelia subramigera</i>	Native
Lichens	Physciaceae	<i>Heterodermia circinalis</i>	<i>Heterodermia circinalis</i>	Native
Lichens	Teloschistaceae	<i>Teloschistes flavicans</i>	<i>Teloschistes flavicans</i>	Native
Bryophytes	Dicranaceae	<i>Campylopus</i>	<i>Campylopus</i>	
Bryophytes	Macromitriaceae	<i>Macromitrium microstomum</i>	<i>Macromitrium microstomum</i>	Endemic
Bryophytes	Sematophyllaceae	<i>Sematophyllum helenicum</i>	<i>Sematophyllum helenicum</i>	Endemic

Table 2. Introduced species found in the survey area

Functional group	Family	Common name	Scientific name	Nativity
Vascular plants	Anacardiaceae	wild mango	<i>Schinus terebinthifolius</i>	Naturalised
Vascular plants	Apiaceae	monkey's ears	<i>Centella asiatica</i>	Naturalised
Vascular plants	Araceae	arum lily	<i>Zantedeschia aethiopica</i>	Naturalised
Vascular plants	Asteraceae	blueweed	<i>Ageratum conyzoides</i>	Naturalised
Vascular plants	Asteraceae	whiteweed	<i>Austroeupatorium inulifolium</i>	Naturalised
Vascular plants	Asteraceae	wild coffee	<i>Chrysanthemoides monilifera</i>	Naturalised
Vascular plants	Asteraceae	fleabane	<i>Conyza bonariensis</i>	Naturalised

Vascular plants	Asteraceae	everlasting	Xerochrysum bracteatum	Naturalised
Vascular plants	Asteraceae	dandelion	Hypochaeris radicata	Naturalised
Vascular plants	Cannaceae	Indian shot	Canna indica	Naturalised
Vascular plants	Commelinaceae	tallow-vine	Commelina diffusa	Naturalised
Vascular plants	Convolvulaceae	kidneyweed	Dichondra repens	Naturalised
Vascular plants	Cupressaceae	Bermudan cedar	Juniperus bermudiana	Naturalised
Vascular plants	Cyperaceae	running sedge	Kyllinga brevifolia	Naturalised
Vascular plants	Cyperaceae	field sedge	Cyperus polystachyos	Possibly native
Vascular plants	Fabaceae - Faboideae	furze	Ulex europaeus	Naturalised
Vascular plants	Hemerocallidaceae	New Zealand flax	Phormium tenax	Naturalised
Vascular plants	Juncaceae	slender rush	Juncus tenuis	Naturalised
Vascular plants	Juncaceae	bull grass	Juncus capillaceus	Naturalised
Vascular plants	Lomariopsidaceae	pheasant-tail fern	Nephrolepis cordifolia	Naturalised
Vascular plants	Oleaceae	black olive	Olea europaea subsp. africana	Naturalised
Vascular plants	Onagraceae	Bolivian fuchsia	Fuchsia boliviana	Naturalised
Vascular plants	Oxalidaceae	creeping sorrel	Oxalis corniculata	Naturalised
Vascular plants	Pittosporaceae	sweet spoor	Pittosporum undulatum	Naturalised
Vascular plants	Pittosporaceae	spoor	Pittosporum viridiflorum	Naturalised
Vascular plants	Poaceae - Pooaideae	common bent	Agrostis capillaris	Naturalised
Vascular plants	Poaceae - Pooaideae	hay grass	Anthoxanthum odoratum	Naturalised
Vascular plants	Poaceae - Pooaideae	summer grass	Ehrharta erecta	Naturalised
Vascular plants	Poaceae - Pooaideae	cardinal grass	Paspalum urvillei	Naturalised
Vascular plants	Poaceae - Pooaideae	kikuyu grass	Pennisetum clandestinum	Naturalised
Vascular plants	Poaceae - Pooaideae	spreading meadow-grass	Poa pratensis	Naturalised
Vascular plants	Poaceae - Pooaideae	Cape grass	Sporobolus africanus	Naturalised
Vascular plants	Poaceae - Pooaideae	mat grass	Stenotaphrum secundatum	Naturalised
Vascular plants	Poaceae - Pooaideae	squirrel's-tail fesque	Vulpia bromoides	Naturalised
Vascular plants	Rosaceae	blackberry	Rubus pinnatus	Naturalised
Vascular plants	Rosaceae	raspberry	Rubus rosifolius	Naturalised
Vascular plants	Solanaceae	bilberry tree	Solanum mauritianum	Naturalised
Vascular plants	Thelypteridaceae	plume fern	Christella parasitica	Probably native
Vascular plants	Verbenaceae	lantana	Lantana camara	Naturalised
Vascular plants	Poaceae - Pooaideae	heath grass	Danthonia decumbens	Naturalised
Vascular plants	Cupressaceae	Mexican cypress	Cupressus lusitanica	Forestry species
Bryophytes	Brachytheciaceae	feather moss	Pseudoscleropodium purum	Naturalised

Appendix 2. Lists of animal species from the Depot

Table 1. Records from St Helena's invertebrate database (Pryce 2014)

Order	Family	Species	Status	Date (late)	Comment
Collembola	Poduridae	<i>Neanura muscorum</i>	Non-native	14/01/2006	
Collembola	Entomobryidae	<i>Orchesella cincta</i>	Non-native	14/01/2006	
Collembola	Entomobryidae	<i>Lepidocyrtus cyaneus</i>	Unknown	14/01/2006	
Collembola	Entomobryidae	<i>Tomocerus minor</i>	Non-native	14/01/2006	
Coleoptera	Coccinellidae	<i>Exochomus flavipes</i>	Non-native	14/01/2006	
Coleoptera	Anthribidae	<i>Homoeodera compositarum</i>	Endemic genus and species	14/01/2006	
Coleoptera	Anthribidae	<i>Homoeodera pygmaea</i>	Endemic genus and species	14/01/2006	
Coleoptera	Curculionidae	<i>Sciobius tottus</i>	Non-native	14/01/2006	
Coleoptera	Curculionidae	<i>Nesiobius minor</i>	Endemic genus and species	14/01/2006	Some uncertainty over identification.
Coleoptera	Curculionidae	<i>Lamprochrus cossonoides cossonoides</i>	Endemic genus and species	14/01/2006	
Coleoptera	Curculionidae	<i>Acanthinomerus conicollis</i>	Endemic genus and species	14/01/2006	
Coleoptera	Curculionidae	<i>Acanthinomerus debilis</i>	Endemic genus and species	14/01/2006	
Coleoptera	Curculionidae	<i>Microxylobius lacertosus</i>	Endemic genus and species	14/01/2006	
Diptera	Limoniidae	<i>Dicranomyia sanctaehelenae</i>	Endemic species	14/01/2006	
Diptera	Psychodidae	<i>Psychoda surcoufi</i>	Non-native	14/01/2006	
Diptera	Dolichopodidae	<i>Campsicnemus mirabilis</i>	Non-native	14/01/2006	
Diptera	Dolichopodidae	<i>Campsicnemus armatus</i>	Non-native	14/01/2006	Some uncertainty over identification.
Diptera	Drosophilidae	<i>Drosophila punctatonervosa</i>	Non-native	14/01/2006	
Diptera	Tachinidae	<i>Atlantomyia nitida</i>	Endemic genus and species	14/01/2006	
Hymenoptera	Figitidae	<i>Leptopilina heterotoma</i>	Non-native	14/01/2006	
Hymenoptera	Ichneumonidae	<i>Echthromorpha agrestoria atrata</i>	Endemic subspecies	14/01/2006	
Hemiptera	Nabidae	<i>Tropiconabis capsiformis</i>	Non-native	14/01/2006	
Hemiptera	Miridae	<i>Oligobiella fuliginea</i>	Endemic genus and species	14/01/2006	Some doubt over the identification.

Hemiptera	Miridae	Helenocoris horridus	Endemic genus and species	14/01/2006	
Lepidoptera	Tineidae	Opogona divisa	Endemic species	14/01/2006	
Lepidoptera	Tineidae	Opogona flavotincta	Endemic species	14/01/2006	
Lepidoptera	Tineidae	Opogona helenae	Endemic species	14/01/2006	
Lepidoptera	Tineidae	Opogona piperata	Endemic species	14/01/2006	
Lepidoptera	Tineidae	Opogona ursella	Endemic species	14/01/2006	
Araneae	Clubionidae	Clubiona dubia	Endemic species	14/01/2006	
Araneae	Miturgidae	Tecution sp.	Endemic genus and species	14/01/2006	
Araneae	Salticidae	Paraheliophanus subinstructus	Endemic genus and species	14/01/2006	
Araneae	Salticidae	Pellenes inexcultus	Endemic species	14/01/2006	
Araneae	Salticidae	Dendryphantes purcelli	Non-native	14/01/2006	
Araneae	Agelenidae	Tegenaria pagana	Non-native	07/02/2006	Recorded as Tegenaria pagana.
Araneae	Tetragnathidae	Leucauge digna	Endemic species	14/01/2006	
Araneae	Linyphiidae	Napometa sanctaehelenae	Endemic genus and species	14/01/2006	
Isopoda	Oniscidae	Oniscus asellus	Non-native	14/01/2006	
Isopoda	Porcellionidae	Porcellio scaber	Non-native	14/01/2006	
Gastropoda	Succineidae	Succinea sanctaehelenae	Endemic species	14/01/2006	
Gastropoda	Pupillidae	Lauria cylindracea	Non-native	14/01/2006	

Table 2. Animal species recorded during the survey

Order	Family	Species	Common name	Status	Date	Determiner
Butterflies	Danaidae	Danaus chrysippus	African monarch	Non-native	06/01/2015	Mikko Paajanen
Butterflies	Lycaenidae	Lampides boeticus	Long-tailed blue	Non-native	06/01/2015	Mikko Paajanen
Butterflies	Nymhalidae	Vanessa cardui	Painted lady	Non-native	06/01/2015	Mikko Paajanen
Birds	Phasianidae	Phasianus colchicus	Ring-necked pheasant	Non-native	06/01/2015	Mikko Paajanen
Birds	Sturnidae	Acridotheres tristis	Indian mynah	Non-native	06/01/2015	Mikko Paajanen
Snails	Succineidae	Succinea sanctaehelenae	Blushing snail	Endemic	06/01/2015	Mikko Paajanen
Mammals	Bovidae	Ovis aries	Sheep	Non-native	06/01/2015	Mikko Paajanen