David Pryce Invertebrate Surveys

Prosperous Bay Plain Invertebrate Survey

2018-19

David Pryce
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INTRODUCTION

Prosperous Bay Plain (PBP) is one of the key areas for endemic species on St Helena and there are currently believed to be 26 species that have only ever been recorded in this area. While the ecology, biology and distributions of some of the species present in the area is known, for most there is still a great deal to be learned. Most recently (2012-2017) a new international airport has been built along the eastern edge of the Central Basin and it is now desirable to find out if this has had any impact on the species assemblage present.

The importance of this area for endemic invertebrates became apparent during the first expedition from the Royal Museum for Central Africa (Tervuren, Belgium) to the island from early November 1965 to late January 1966; indeed, the desire for more specimens from this particular area was one of the primary drivers for their second expedition which occurred from late January to early June 1966 (Basilewsky, 1970). These two expeditions are collectively referred to as 'the Belgians' throughout the report.

Between September and December 2003 Philip and Myrtle Ashmole undertook a survey of PBP and other sites in the 'Eastern Arid Area' (EAA), as shown in Figure 1 to ascertain if many of the species found by the Belgians were still present, to assess their current status and produce an identification guide to the species present (Ashmole & Ashmole, 2004a, 2004b). This work was commissioned by St Helena Government and funded by the UK Foreign and Commonwealth Office; it stemmed from the need to assess the fauna of the area prior to the construction of the proposed airport and will be referred to as 'the Ashmoles' throughout the report.

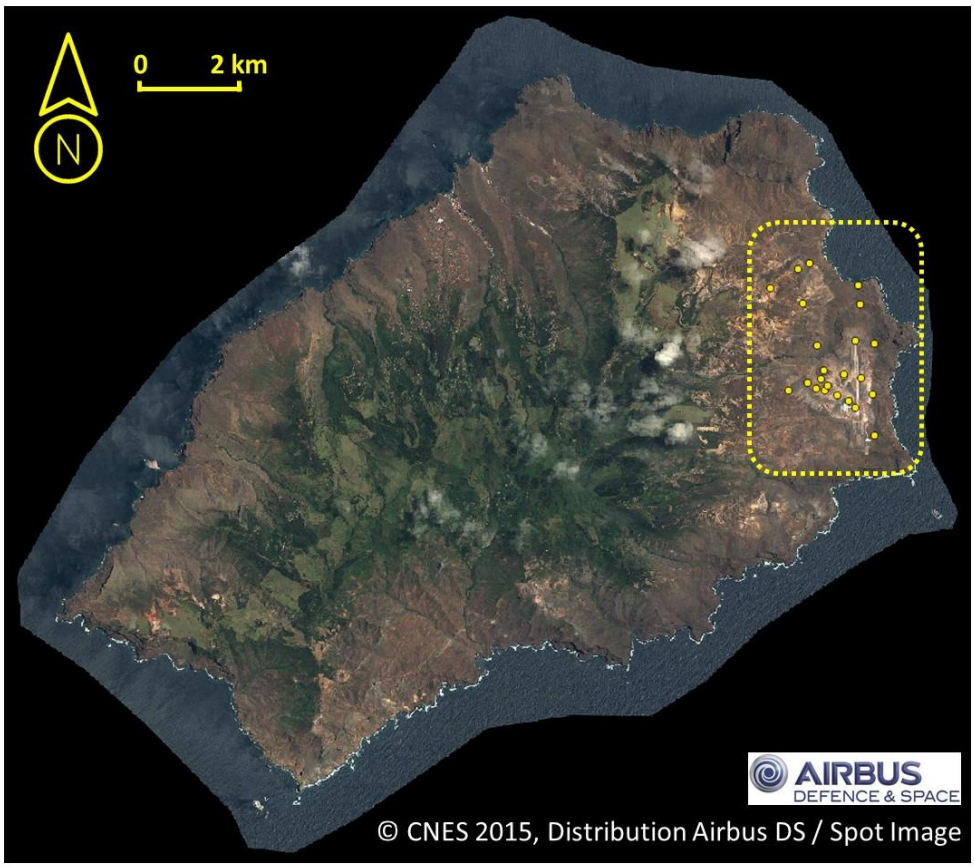

FIGURE 1: Approximate extent of the 'Eastern Arid Area' as defined by the Ashmoles' survey sites (Ashmole & Ashmole, 2004a).

During the financial crisis of 2007-10, the construction of the airport was put on hold, but the project was kick-started again in 2011, with a contract to build being signed with Basil Read (Pty) Ltd. of South Africa on the 4th of November of that year.

Prior to, and during airport construction, a number of surveys were undertaken for specific purposes across the site footprint to asses the fauna present and inform mitigation work that would follow (Cairns-Wicks & Lambdon, 2013; Pryce, 2013a, 2013b, 2014, 2016; Pryce & Paajanen, 2014). A detailed history of the entomological work undertaken at the area is given in Appendix A.

This current work is funded by St Helena Government via the Landscape and Ecology Mitigation Programme (LEMP). It stems from a desire to repeat (and build on) the work of Philip and Myrtle Ashmole, 15 years on; to look at seasonal changes in the fauna, to document observable changes in the faunal assemblage through time and to suggest mitigation and site management work that could be undertaken to improve the area for the associated invertebrate fauna. The survey additionally attempts to ascertain whether construction of the new Airport adjacent to the site has had any impact upon it.

The sole focus of this survey is the Central Basin of Prosperous Bay Plain. This area surveyed is shown in Figure 2; it comprises the entirety of the Central Basin itself, plus bounding areas comprising the ridge lines adjacent to the Airport road to the west and south (Tungi Flats and the Southern Ridge), on the east by the Airport fence and the north by the uppermost reaches of the scarp formed by lower Fisher's Valley.

FIGURE 2: The extent of the area surveyed during this project, as defined in the text above, and its relation to the Airport, runway and Airport access road.

Concerns have been raised that Java geckos (*Hemidactylus frenatus*) may be having an adverse impact on invertebrates in this area (Roger Key, pers. comm.), and that a second species may also be present (Howard Mendel, pers. comm.). The Belgians reported that the gecko was most commonly found in Rupert's Valley with lesser numbers being found in Jamestown, Ladder Hill, Sugarloaf and Bank's Valley; this species is now well-

established on Prosperous Bay Plain and most other hot, dry areas in the north of the island. A novel approach using artificial substrates (standardised rectangles of corrugated iron placed across the site in a randomly selected 150 m grid) was investigated to see if these would attract geckos and offer a potential means of control for this invasive species at this location.

SURVEY DESIGN CONSIDERATIONS

The author's personal copy of the St Helena invertebrate records database[1] contains a total of 966 records of invertebrates from the survey area; a total of 216 species have been recorded from the area, 77 of these being endemic, most significantly of all, 26 species have only ever been found in this area.

There has been some concern that this area has been over-sampled – the database shows that 13,026 invertebrates have been recorded from this area. Although a number of these records will have been sightings or photographs of common and easy to identify species, many are simply an indication of 'presence' with no indication of the number collected. The Belgians' expeditions took at least 10,176 invertebrates from the site (Basilewsky, 1970, 1972, 1976, 1977). The Ashmoles' surveys (Ashmole & Ashmole, 2004a, 2004b), plus further work done here during the 'Peaks Survey' (Mendel, Ashmole & Ashmole, 2008) only occasionally give an indication of the number of specimens collected. Consequently the figure of 13,026 specimens being taken from the site since 1965 is to be considered conservative.

One of the biggest challenges in designing the survey was dealing with uncertainty in the data. The Belgians were not very precise with recording the exact location their specimens were collected and they often worked over quite a large area in the course of a day and simply called the sample 'Prosperous Bay Plain.' While we do have GPS coordinates for the Ashmoles' locations, we do not know the relative abundances, or precise sampling techniques used to collect the individual specimens, except from a few comments recorded in their database. Additionally, one of the sampling techniques used in this study (bottle traps) proved impossible to recreate with the resources currently available on island and the pitfall and bottle trap preservative (Turquin's solution) used formalin, so an alternative had to be formulated.

A list of the search and trapping methodologies used by the Belgians, the Ashmoles and later surveys is given in the Table 1 below:

Method	The Belgians 1965-7	Ashmole & Ashmole, 2004	Cairns-Wicks & Lambdon, 2014	Pryce, 2013a	Pryce & Paajanen, 2016	Pryce, 2016	DPLUS040	This survey
Hand searching	Used	Used	Used	Used	Used	Used	Used*	Used
Sweep netting	Used	Used	Used	Used	Used	Used		Used
Pitfall trapping	Used	Used	Used	Used	Used	Used		Used
Bottle trapping		Used						
Berlese extraction	Used			Used	Used	Used		Used
Suction sampling				Used	Used			Used
Malaise trapping					Used	Used	Used	Used
Light trapping							Used*	

TABLE 1: Summary of sampling methodologies used by the various surveys undertaken in the area.
* A small amount of hand-searching and a light trap was trialled once (Amy-Jayne Dutton, pers. comm.)

[1] It is planned to merge this database with the 'official' version held by Roger Key in the UK at the end of this project. A copy of the database and the accompanying species list used by the author while writing the report will be submitted to SHG on completion of the final report. The author's versions were maintained from June 2017 onwards and are believed to be accurate, barring the inclusion of data from the DPLUS040 project.

No specific details of weather conditions were noted on-site during sampling (late August 2018 to late March 2019); in retrospect, this should have been more accurately recorded, particularly for the temporal survey with respect to hand searching, BugVac and the collection of a Berlese sample (see below), which were done on specific days, unlike pitfall and Malaise trapping, which took place across a seven day period, so being less likely to be affected by weather conditions on a particular day.

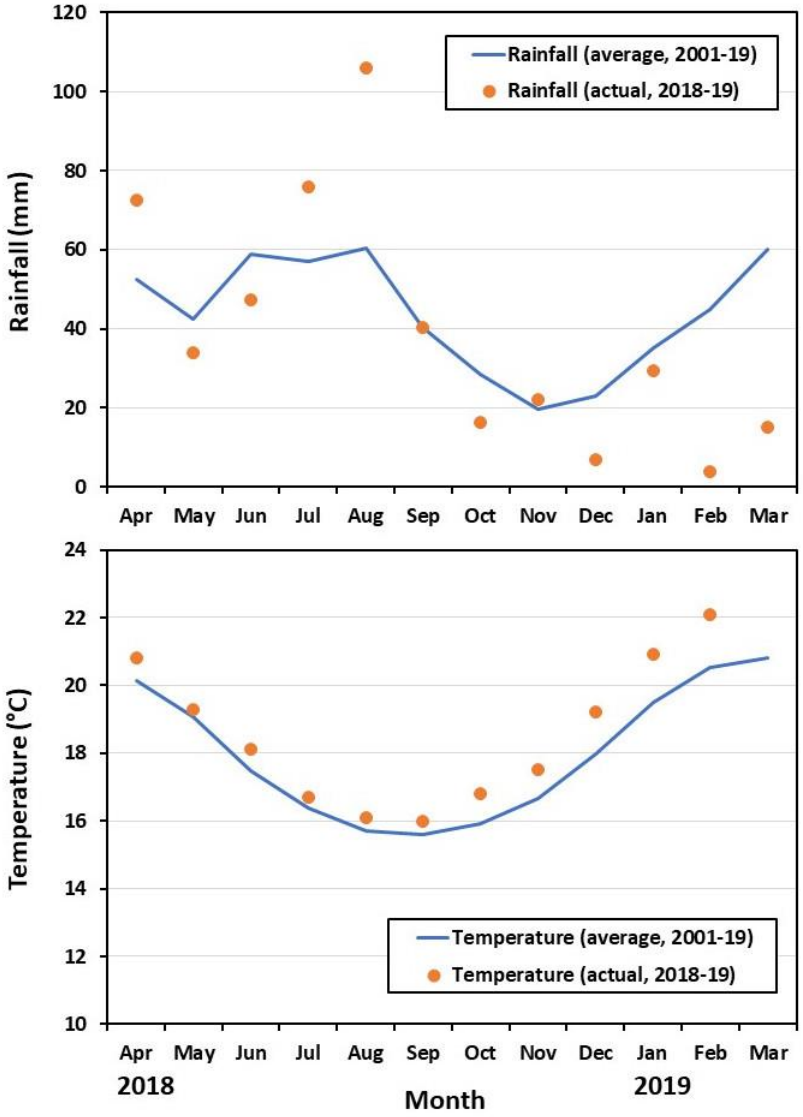

FIGURE 3: Average monthly rainfall (upper graph) and temperature (lower graph) data from the MO station at Bottom Woods, plotted against the 2001-2019 average.
Graphs plotted for the year beginning in April 2018, to show conditions before the survey, until its conclusion in March 2019.

In general, the weather encountered during the survey 'felt' cloudy and cool until the end of January, when it began to warm up and 'blue sky days' became more common. Rainfall figures from the Meteorological Office (MO) station at Bottom Woods (WGS84 UTM 0214419 8235626), Figure 3 (upper graph), shows that rainfall was above average before and at the start of the survey (July and August), generally near average during the early to middle part of the survey (September to January), but significantly below average at the end of the survey (February and March). [It should be noted that the value for rainfall in March had not yet been finalised by the MO team. The value used here is from the author's own MO standard rain gauge at Pink Grove

Levelwood (WGS84 UTM 0213152 8232571). Over the period of its operation this has a near identical average annual rainfall to that of the MO (514 vs. 505 mm) and a Pearson correlation coefficient between monthly average values of 0.977, indicating that this is a scientifically valid inclusion.]

Temperature figures from the MO indicate that the year was near average up to the start of the survey (April to September), but slightly above average through the remainder of the survey (October to February).

Survey sites

Nine sites from the Ashmoles' 2003 survey lie within the boundary of the survey area. A list of the sites, their names and abbreviations is given in Table 2 below. The habitat map for the area, resulting from DPLUS052 project (Mapping St Helena's biodiversity and natural environment) is given in Figure 4.

Site number (2003)	Site name (2003)	Abbreviation (this report)	Habitat (as defined below)
1	Central Plain West	CPW	BS, SSD, SNA
2	Central Basin East	CBE	BS
5	Upper Bone Gully	UBG	SPP, BS, RA
8	Samphire Plain	SP	SSD, SNA
12	Widow Slope	WS	BS, RA, SSD, SNA
14	Stony Area	SA	CWSD, RA, SSD
15	Stony Outwash	SO	SSD
22	South Basin Samphire	SBS	SSD, CWSD, SNA, RA
24	Basin Yellow Dust	BYD	SSD, SNA, CWSD, BS

TABLE 2: Site numbers, names and abbreviations surveyed in 2003 and used in this report. The habitats present are given in approximate order of decreasing importance at each site and are defined as; SPP – Sparse Pricky Pear, SSD – Samphire Semi-Desert, CWSD – Creeper Waste Semi-Desert, BS – Barren Soil, SNA – Succulent Native Annuals, RA – Rocky Areas.

METHODOLOGY

A – MAIN SURVEY

In order to make the current survey as comparable as possible to the results of the 2003 study (Ashmole & Ashmole, 2004), the survey was repeated at the same time of year, and using as near as possible the same techniques as those used previously. However, it did not prove possible to duplicate the 'bottle traps', and the use of formalin as a preservative is now strongly discouraged due to health and safety concerns. The three other techniques used by the Ashmoles were therefore supplemented by Berlese extraction and suction sampling at each site and a Malaise trap was also used at a single site adjacent to the Stony Outwash site. As these additional sampling techniques would generate many extra specimens for identification, the amount of time spent observing and searching by hand and sweep netting was reduced to avoid over-sampling and excessive ground disturbance at the sites.

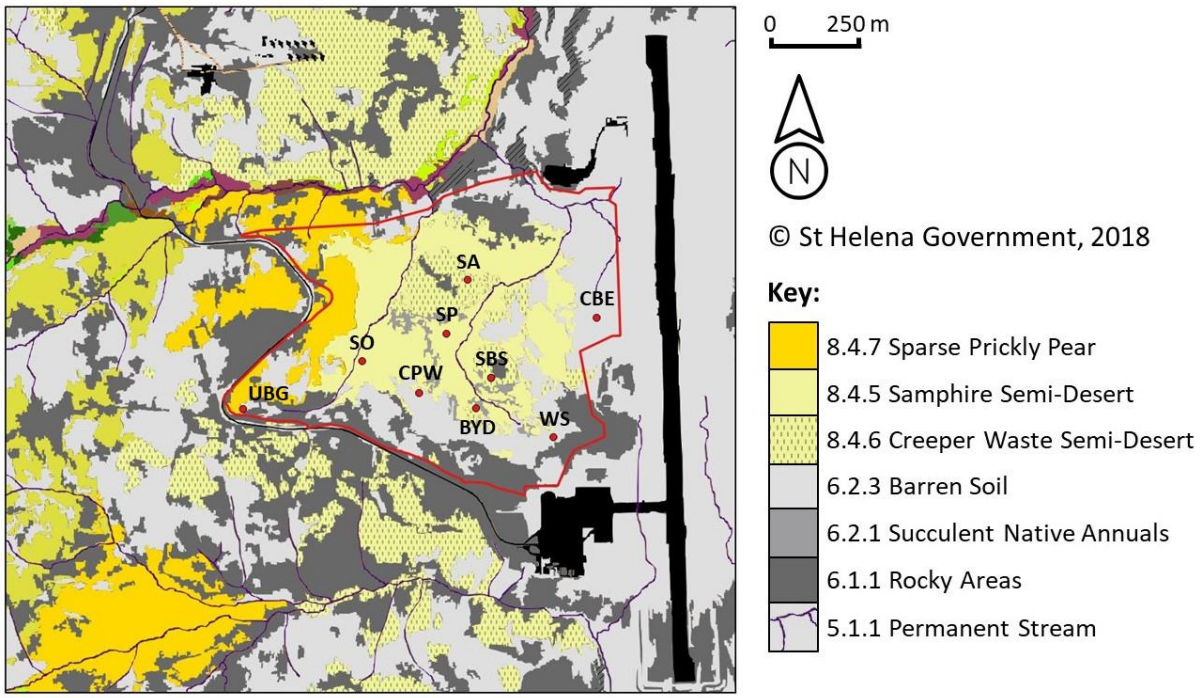

FIGURE 4: Habitat map for the survey area.
The survey area is marked as a red line, the Ashmoles' (2003) sites as red dots, labelled as per Table 2; only habitats occurring within the survey area are given in the key.

The full methodology for collecting a sample comprised:

- Pitfall trapping: eight traps consisting of a 250 ml plastic beer glass were installed with the brim level to the ground. They were randomly distributed around the survey area and placed in the lee of bushes to minimise evaporation. A collar of 10 x 20 mm galvanised aviary mesh was placed around the trap to stop mice falling into the trap (this would draw in large numbers of non-native necrophagous invertebrates). It was then capped with a white corrugated plastic panel which also helped to reduce evaporation. The pitfall fluid comprised 500 ml Guinness, 500 ml white spirit vinegar and 5 ml Dettol anti-bacterial multi-action cleaner. Initial trials baiting the traps with blue cheese (as per the Ashmoles' survey) proved ineffective, as mice could still reach in and consume the bait, usually within a day or so of it being installed. This was discontinued after the second sample and found to make no statistical difference to the species collected. The traps were left in place for a total of seven days. A series of three images showing a typical pitfall trap being installed is given in Figure 5.
- Berlese extraction: a representative sample of about 2 litres of dead wood and other dead organic matter from the site was collected from each site; invertebrates were extracted using a naphthalene gradient in a funnel system, directly into a tube of 70% isopropyl alcohol over a seven day period.
- Suction sampling: this was undertaken using a modified Makita EH025 petrol-powered garden leaf vacuum / blower ('BugVac'); each sample was 0.25 m², comprising 24 'sucks' of about one second each; the sample was placed in a tray and specimens collected with a 'pooter', specific attention being paid to the collection of flying invertebrates during the first few seconds of sample exposure.
- Hand searching: one hour was devoted to hand searching each site and comprised approximately 30 minutes sweep netting of vegetation and 30 minutes observing any flying insects and searching under stones; identifiable parts of dead insects were also collected.
- A Malaise trap was erected in Lower Bone Gully, adjacent to site SO at WGS 84 UTM 0215765 8233815 for seven days. The location of this trap is shown in Figure 6. This particular site was chosen as it was the point most sheltered from the south-easterly trade wind, that was available in the survey area, thus

maximising the chance of trapping flying invertebrates in the area and also minimising the possibility of damage to the trap.

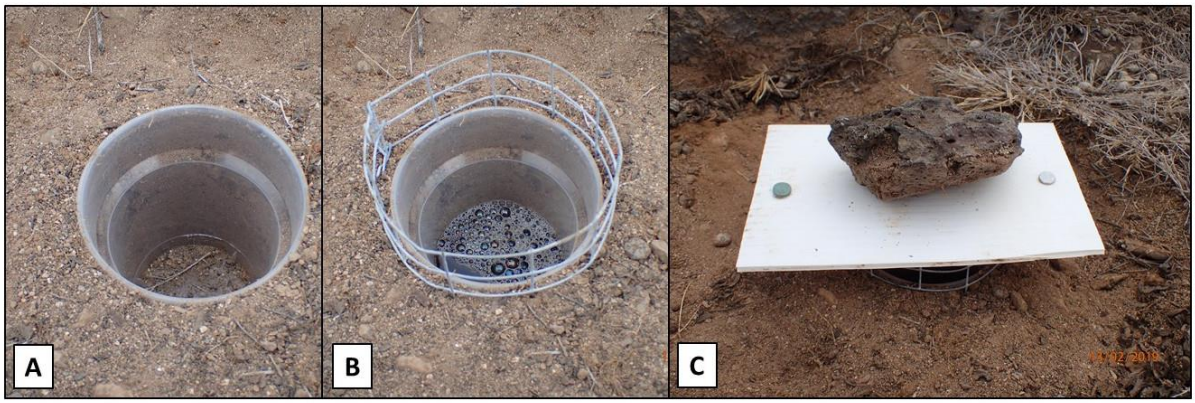

FIGURE 5: A typical pitfall trap installation.
A – pitfall trap in ground, B – pitfall fluid and rodent excluder added, C – final installation with rain excluder and rock to stop it blowing away.

FIGURE 6: The Malaise trap used at Lower Bone Gully.
A – looking up the valley towards site UBG (out of sight, top right), B – looking down the valley through site SO towards the main access track into the Central Basin, with Airport runway and King and Queen Rocks in the distance.

A stereo-zoom microscope at 7 to 45 x magnification was used to identify specimens, supported by the '*Faune Terrestre de l'île de Sainte-Hélène*' (Basilewsky 1970, 1972, 1976, 1977), Ashmole & Ashmole (2004), Mendel, Ashmole & Ashmole (2008) and other relevant scientific literature. During hand-searching, common and easy to identify species were simply noted as 'present'.

Dead or partial specimens e.g. a single ladybird elytra or the shell of a snail were also noted to indicate the presence of a species at a particular site, as many of these species will occur at low densities in an arid environment like this, while dead remains persist, potentially for decades. This appears not to have been done by the Ashmoles, as there are literally only five records of the Blushing snail (*Succinea sanctaehelenae*) and Garden snail (*Cornu aspersum*) in their database, across their entirety, but the evidence on the ground, plus live observations made during the current survey indicates that these species are widely present, but generally at very low densities.

A list of the GPS coordinates of all pitfall traps is given in Appendix D; the centroid of these should be used as the GPS coordinate for the other types of sample taken, but with a lower radius of accuracy (~50 m for other sampling types as apposed to ~10 m for the pitfalls).

B – TEMPORAL SURVEY

To determine if seasonal changes were occurring before and after the main survey a second, repeated, temporal survey was undertaken at three of the nine sites (Stony Outwash – SO, Stony Area – SA and Central Basin East – CBE). These sites were selected as they had the largest areas of three contrasting microhabitats available for survey. These consisted of 'half-samples' taken along serially adjacent strips to the edge of the main sampling area every six weeks from the week commencing 20th August 2018 to 18th March 2019. Each sample consisted of:

- Pitfall trapping: four traps, as above, in place for seven days.
- Berlese extraction: a sample of approximately 1 litre of dead wood and other dead organic matter, invertebrates extracted as above.
- Suction sampling: 12 'sucks' as above.
- Hand searching: 30 minutes devoted to hand searching each site, comprising 15 minutes sweep netting vegetation and 15 minutes observing any flying insects and searching under stones.
- A Malaise trap was erected at the same location, as above. The poles used to erect the trap were left in position between samples in order to ensure that it was set up in precisely the same position each time it was used.

The main survey coincided with the third and fourth temporal surveys, as shown in Table 3.

Week commencing	Sample(s)	
20th August 2018	Half sample	
1st October	Half sample	
12th November	Half sample	Main sample starts
24th December	Half sample	Main sample ends
4th February 2019	Half sample	
18th March	Half sample	Planned but not taken, with the exception of operating the Malaise trap.

TABLE 3: Schedule for collecting temporal and main surveys.

Although planned, the final temporal sample was not collected, as there would not have been time to process it and incorporate the data generated from it into the report before submission and acceptance by the end of the financial year; it did, however, prove possible to run the Malaise trap and incorporate this.

In addition to the three standard half-samples, a fourth half-sample was taken from a 'randomly' selected site chosen by the author. These were at locations hitherto thought to not have been surveyed in depth and were selected from areas with no known invertebrates records using QGIS, or were areas of possible interest that may have been under-sampled (e.g. Stone Hill summit). The taking of this random sample was an attempt to discover any other areas that may harbour previously undiscovered biodiversity, as happened during the DVOR (Doppler Very high frequency Omnidirectional radio Range measuring equipment) fence line survey (Pryce, 2016).

C – GECKO SURVEY

In order to assess the distribution and abundance of geckos across the site, an experimental approach was undertaken with the provision of 30 standardised artificial habitats across the area. Six 2.4 m sheets of galvanised, unpainted corrugated iron were cut into four to create standard rectangles 0.60 x 0.83 m in size. These were placed across the site in a randomly chosen 150 m grid preselected in QGIS to give the best coverage across the site; each sheet was placed with the corrugations at right angles to the prevailing wind and the leading edge downmost to provide the maximum amount of potential shelter. The sheets had to be weighed down by rocks at their leading and trailing edges to avoid them being displaced during strong wind.

During the collection of each half sample all of the sheets were lifted to see if they had been colonised by geckos; at 15 of the sites any geckos found were removed and humanely euthanised to see if further colonisation then occurred. Presence of other invertebrates (particularly the field cricket *Gryllus bimaculatus*) was also recorded, as colonisation by this widespread and common species may be a precursor to the arrival of geckos once they realise the potential value of the site as a food source. Faecal pellets found during the survey would be disaggregated and analysed to determine, if possible, the species they have been predating.

D – SPIDER EYE-SHINE SURVEY

Most of the endemic lycosid (or wolf) spiders are nocturnal. One novel survey technique involves visiting the survey area at night with torches; their large eyes reflect torchlight back off the rear of their lenses, rendering the location of the otherwise well-camouflaged spiders visible (Figure 7).

FIGURE 7: Spider-eye shine from lycosid spiders at Prosperous Bay Plain, 24th February 2019.

E – VEGETATION SURVEY

At the start of the survey period a full vegetation survey was undertaken at every proposed survey site. This was undertaken as early as possible to maximise the possibility of locating ephemeral species growing after the winter rains. The abundance of all species present, as well as some non-biological features such as the extent of bare ground and the amount of rocks with crevices present, was recorded using the DAFOR scale. At gecko survey sites a 10 m radius was used from the site centroid, at all other sites a 25 m radius was used.

F – SITE NUMBERING

To facilitate the survey, the Ashmoles' nine original sites were abbreviated as above. To avoid any potential confusion with any sites used by the Ashmoles and those used in this survey, the gecko survey sites were given the letters B (rather than A) through to F for rows, from WGS 84 UTM 8233650 every 150 m from south to north, and the numbers 1 through to 8 for columns, from WGS 84 UTM 0215500 every 150 m from west to east. The Malaise trap was numbered M1 and the five random samples R1 to R5.

RESULTS

The results from the various surveys are discussed separately below. There follows a general discussion of the invertebrates recovered and their significance. Detailed data is given in Appendices E, F and G, and information on all species recovered is given in Appendix I. The overarching conclusion of the results is that it appears that the construction of the Airport has had little measurable detrimental impact on species across the site. However, there are some discrepancies between the data collected by the two surveys at Samphire Plain (SP) and South Basin Samphire (SBS) that are unexplained and could be a result of natural changes, or (potentially) a consequence of airport construction.

A – MAIN SURVEY

The main survey was originally planned during the design phase, to be completed in the three weeks commencing the 6th November, but for logistical reasons this proved impractical; however, the survey was still completed within the same time window (September to December) of the 2003 survey, so they should be directly comparable.

The survey has generally been very successful, with 66 species being added to those previously known to have been recorded from the site (author's own record file, plus DPLUS040 data). On average, 69.2% more species were found at each of the Ashmoles' nine sites in the survey area (Figure 8, upper graph), and, on average, 37.3% more endemics were detected at each site (lower graph). The only site where more species were recovered in 2003 than during the present survey was at Samphire Plain, where the current survey recovered 6.4% fewer species than in 2003. When looking at endemic species only, two sites (Samphire Plain and South Basin Samphire) saw fewer species recovered than in 2003 (20.0 and 15.0% respectively). It is not thought the large number of new species added to the site list is caused by more invertebrates moving into the area between the surveys, but is most likely an artefact caused by different sampling techniques

A total of 122 taxa were recovered during the main survey, as compared to 102 during the 2003 survey; it should be noted that the apparent discrepancy between these figures and those given above is a result of taxa or morphotypes recovered during one survey and not during the other. A full breakdown of the species found

and their relative abundances recovered, using the different survey techniques used, is given in Appendix E. These figures indicate that the current survey has been more rigorous than that of 2003.

It is not thought that the sampling completed during this survey has 'oversampled' the areas in question, indeed the overall sampling effort was reduced to avoid this. The increase in the number of species between the two surveys is a result of the addition of Berlese extraction and suction sampling using BugVac. Both of these techniques yield many additional species with little extra disturbance (the removal of approximately one litre of dead wood and other organic material per site and the suction sampling of 0.25 m² ground during the main survey; half of this during each 'half-sample' of the temporal survey).

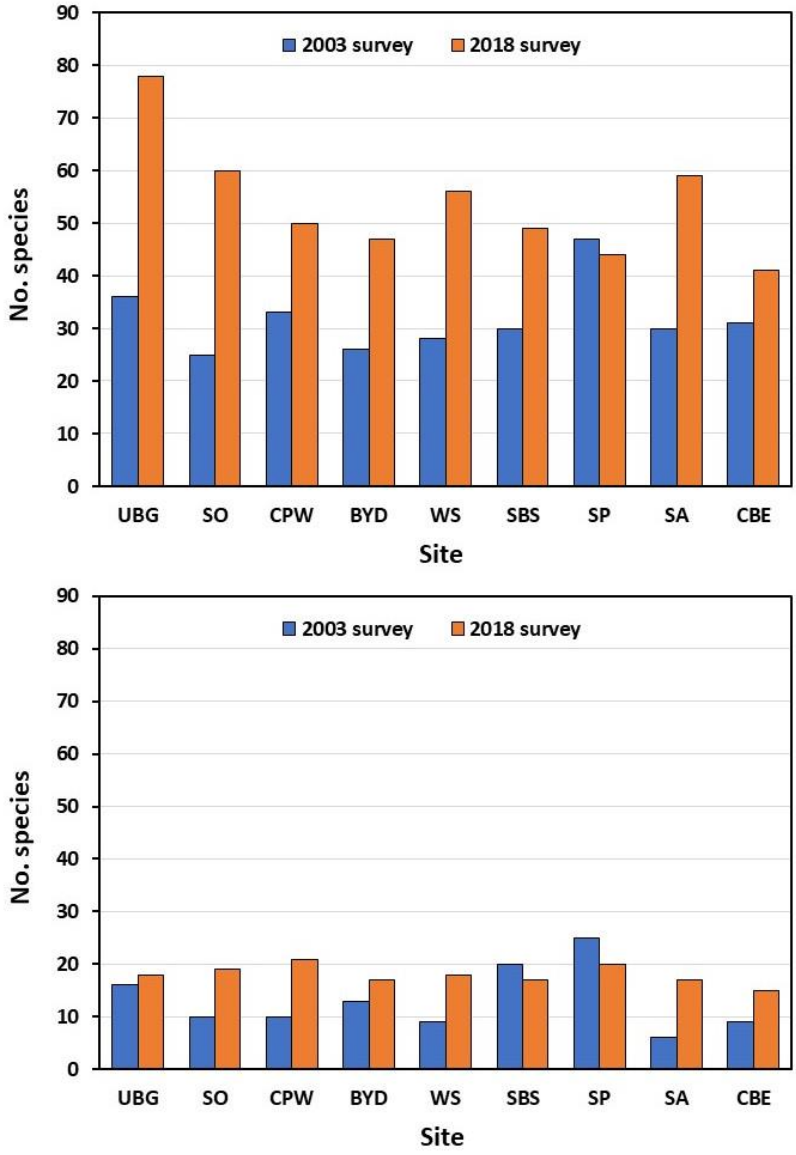

FIGURE 8: Comparison of the number of species recovered from each site during the main survey, as compared to those recovered in 2003.
Upper graph, all species; lower graph, endemic species only (to the same scale).

The number of species found only during the 2003 survey, only during the 2018 survey and during both surveys is shown in Figure 9, both for all species and endemic species only, with both graphs given at the same scale to allow direct comparison. It can be seen that the approximate proportion in each category is generally consistent across all nine sites, with the exception of Samphire Plain (SP), where there appears to be a

different pattern in the species found (a higher proportion of species found only during the 2003 survey, a lower proportion of species found only during this survey, and a slightly higher percentage of species found during both surveys). This, coupled with the information on the overall number of species (above) indicates that something has changed at this site between the two surveys. However, the precise nature of this change will not be possible to determine without advanced statistical analysis (e.g. principal component analysis – PCA, or canonical correlation analysis – CCA) that are beyond the scope of the this project. The author speculates that this may be the result of plant species composition changes, or possibly deposition dust caused by blasting during Airport constriction.

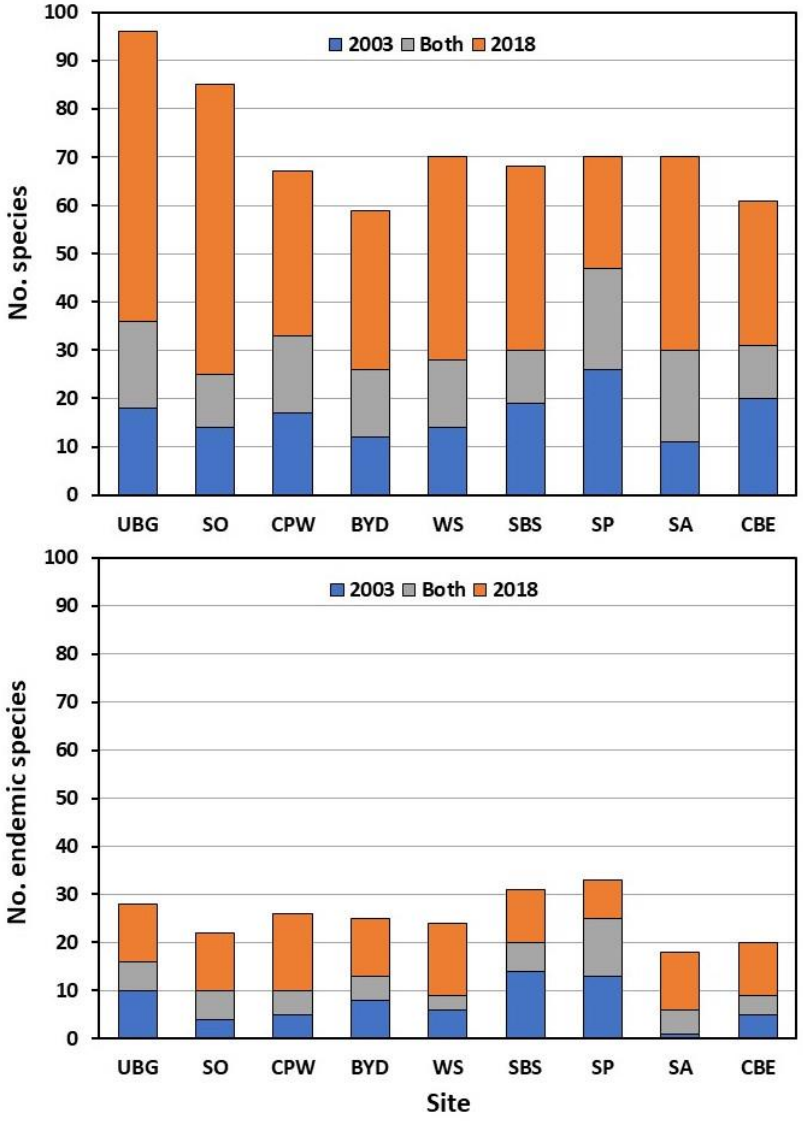

FIGURE 9: Comparison of all species found during the 2003 survey, the 2018 survey and both surveys for all species and endemic species.
Upper graph – all species; lower graph, endemic species only (to the same scale).

It is interesting to note that at *every* site there were species recovered by one survey but not by the other; this can only be put down to differences in surveying techniques, unconscious sampling biases and uncertainty in the data. An example of the latter occurs for spiders of the family Oecobiidae where the Ashmoles recorded three known, described species (*Oecobius cellariorum*, *O. navus* and *O. similis*), plus two unknown or potentially undescribed species ('*Oecobius* sp. A' and '*Oecobius* sp. B'); as no features to differentiate these species were given in the report, it can only be possible for the author to report specimens of the family as

'Oecobiidae indet.' and leave the individual specimens to be differentiated by a taxonomic specialist at a later date. There was no time for this type of work to be done during the survey, as it would have been necessary to find a specialist in this particular family of spiders in order to do the work. The specimens will remain in the reference collection on island until these instances can be resolved in the future.

The higher number of non-native invertebrates found during the current survey is probably an artefact resulting from differences in sampling methodologies, particularly the use of Berlese extraction and BugVac. Both these techniques produce large numbers of specimens, particularly the smaller species that may have been missed using other methods. It is also probably the case that most of the endemic species present at the site *have already been found*, and so there are no significant new ones that *can* be added to the list for a site, just *relative* changes in abundance or movement of species around the site caused by habitat changes between the two surveys.

An attempt was made to *objectively* score the average rarity and importance of endemic species at each site. The process adopted is analogous to, and based on the 'BMWP kick sampling' protocol used by the UK Environment Agency and other organisations to *objectively* measure the health of a water body. BMWP samples are collected in a standardised manner (a three minute kick-sweep sample using a standardised net). Invertebrates collected are identified to family level and each of these has a score associated with it, from ten (indicating that it is highly sensitive to organic pollutants) to one (a very broad tolerance to organic pollutants), the combined score of all taxa thus giving an idea of how polluted a site may or may not be. Another value generated from this is the ASPT (Average Score Per Taxon) which gives a value for the average tolerance of the invertebrate families found in the sample; this is useful as it does not depend on family richness (in terms of the number of species therein) used to derive the above score.

In an attempt to objectively score the relative value of the 'average' endemic species present at each site during the main survey (and the Ashmoles' earlier survey) each species was scored with regards to measures of its rarity and importance to the island's fauna (as derived from the author's own species record file). Species were scored as follows:

- Non-native – 0.
- Indigenous / native – 0.
- Endemic species – 2.
- Endemic genus and species – 2.
- Species apparently new to science – 2.
- Less than 5 records in the invertebrate database – 2.

The product of these values was then calculated, so that each species could score 0, 2, 4, 8 or (theoretically) 16. These values were then summed for each site and divided by the number of *endemic* taxa present to give an average score per taxon (ASPT). This calculation *should* produce a value for each site that *objectively* values the relevant importance of the species assemblage present therein, and thus allow direct comparison between sites and surveys. A graph showing the calculated values for each site from the two surveys is shown as Figure 10.

It can be seen that the calculated scores from the 2018 survey are generally slightly higher than those from the 2003 survey, except at Samphire Plain (SP), where they are almost identical (3.231 and 3.238 respectively) and South Basin Samphire (SBS) where the 2003 score is higher than that from the current survey. It is potentially possible that species at this site have been impacted by Airport development (the site is essentially a wind gap where dust from blasting would have been concentrated), but it could also be a result of the earlier survey's higher survey effort that was invested in endemic spiders that are particularly important at this site.

The fact that the scores from most sites are relatively similar, taking into account the apparently more rigorous nature of the current survey, is heartening – there has been no obvious decline in habitat quality as a result of Airport construction. That the scores are not much greater from this survey, despite its apparent more rigorous nature, probably results from the fact that all of the endemics have actually been found, and there are simply no, or very few new ones that can be added to the known assemblage at a site.

A more detailed assessment of the analysis of sampling effectiveness of the main survey and Malaise trap surveys undertaken can be found below.

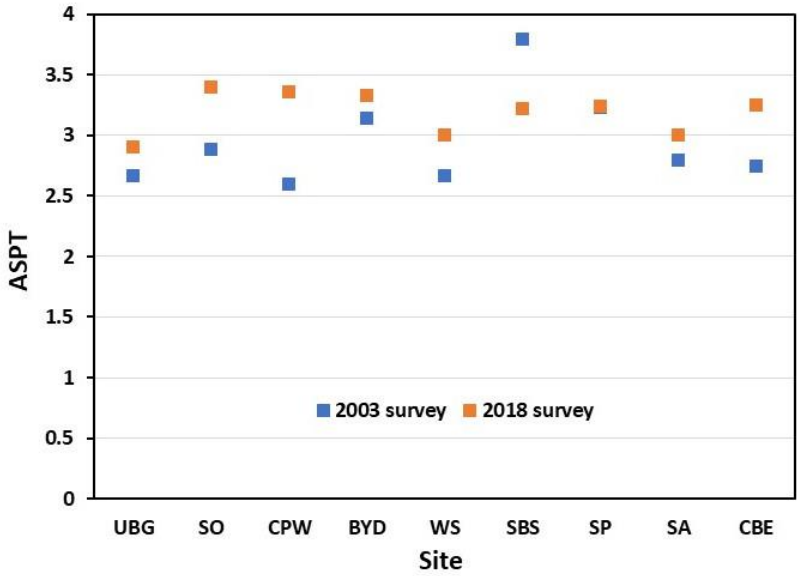

FIGURE 10: Calculated scores for endemic taxa at each site from the 2003 and 2018 surveys.

B – TEMPORAL SURVEY AND MALAISE TRAP

The number of taxa recovered from the temporal samples was 128; 134 were recorded in the Malaise trap. A combined total of 176 species were found by combining the two species lists, showing the differences between the combined sampling methodologies of the temporal survey and that of the Malaise trap. However, when the total number of species collected during each 'sample' are plotted together (Figure 11), it can be seen that there are obvious seasonal differences through the sampling period. Pearson product-moment correlation coefficient values between the various samples are given in Table 4. It can be seen that four of the correlations pass the two-tailed 0.05 test for significance for five samples (0.754) and one of the remaining two passes the 0.1 test for significance (0.669), with only the correlation between SO and CPW failing to meet these criteria. This is strongly suggestive that there is a linkage between seasonal conditions and species composition across the site. The most likely driver for this change is the seasonal drying that occurs across the site after the 'winter' rains have ended. During this period many ephemeral species go through dieback, therefore reducing food availability for invertebrates, particularly among the more palatable species (e.g. purslane).

It is interesting to note that the number of species found in the Malaise trap in sample 5 was much higher than expected. This is probably explained by the fact that the weather was noticeably sunnier while the trap was in place, than during the other samples. As invertebrates depend on their environment for heat, and tend to be more active when it is hot than when it is cool, and Malaise traps are particularly good at trapping flying insects (particularly flies and wasps), this is entirely expected. Further information on the invertebrates from the Malaise trap can be found below.

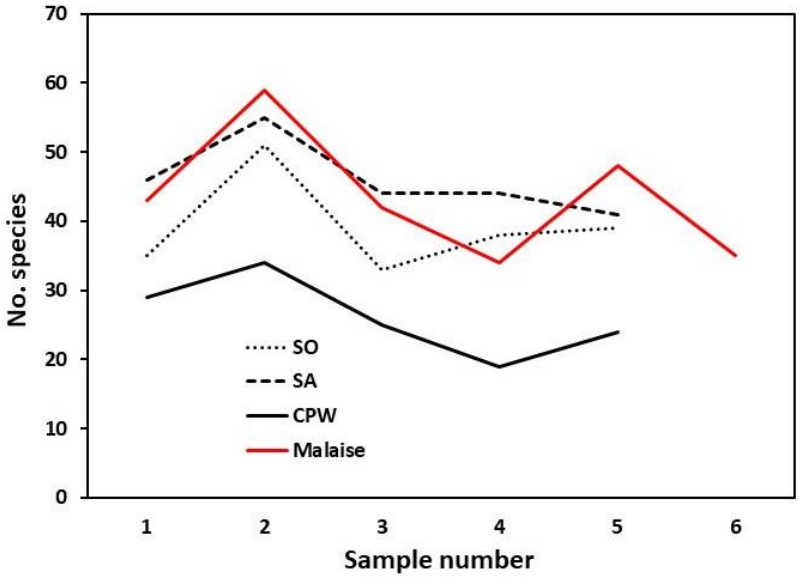

FIGURE 11: The number of species recovered during the temporal surveys (excluding 'random' sites).

	SO	SA	CPW	Malaise
SO	–			
SA	**0.815**	–		
CPW	0.613	**0.815**	–	
Malaise	**0.793**	0.707	**0.867**	–

TABLE 4: Pearson product-moment correlation coefficients between the various temporal sample sites. Correlations that pass the two-tailed test for the 0.05 level are shown in bold.

C – GECKO SURVEY

Geckos began to colonise the artificial substrate, but only quite slowly, with only a single gecko being found during the collection of temporal samples 2 and 3, and 4 during collection of the fourth. The cool weather at the start of the survey period, which only started to warm up between samples 2 and 3, probably hindered their colonisation, as the heat differential was probably not great enough for them to find the sheets attractive. During the fifth temporal survey, during much warmer weather, a total of 14 geckos were found, showing that the technique has distinct possibilities for use in a gecko control programme at this site. A sequential series of maps, showing the number of geckos noted at each site is presented in Appendix C.

It was noted that the non-native field cricket *Gryllus bimaculatus* readily colonised many of the panels and the geckos may well have followed once the ready food source was detected.

No gecko faecal pellets were located during the survey. Two faecal pellets from the Central Basin (near site SA) were analysed by the author at St Paul's Primary School Science Fair several years ago. These contained the remains of at least 30 specimens of the endemic weevil *Microxylobius westwoodi*, plus partial remains of salticid spiders, indicating that they could be having a serious impact on endemic species at the site, particularly weevils. It is also interesting to note that *M. westwoodi* is by far the commonest weevil in the area, therefore most likely to be predated on in the first place, and there is still a thriving population present that seems to be able to cope with this level of attrition.

One interesting qualitative observation is that rocks that have a non-gecko invasive, non-native predator such as Brown widow spider (*Latrodectus geometricus*) or Red-headed centipede (*Scolopendra morsitans*) resident underneath also tend to harbour other invertebrates; those with a gecko present underneath are generally sterile with respect to the presence of other invertebrates. This most likely indicates that *L. geometricus* and *S. morsitans* are able to co-exist with other species present in the area, including endemics, whereas geckos are voracious predators and eat everything in their chosen resting location.

D – SPIDER EYE-SHINE SURVEYS

A survey was undertaken on 19 December 2018 with Dr Rebecca Cairns-Wicks.[2] The Prowling wolf spider (*Hogna nefasta*) was found to be extremely common to the south east of stone hill, with numbers apparently even better than had been present when last surveyed in 2011; however, it should be noted that this observation is qualitative and anecdotal. During this visit, numbers of the Lurking wolf spider (*Trochosippa* sp.) were very low, with only one or two seen.

FIGURE 12: Comparative photographs of spider eye-shine during a survey in 2011, with one taken during the current survey.
A – photograph taken by Dr Roger Key, 17/04/2011, B – taken by the author on 24/02/2019.

A second survey was undertaken on 24 February 2019, again with Dr Cairns-Wicks. Numbers were found to be even higher than during the previous visit, with numerous Lurking wolf spiders (*Trocosippa* sp.) seen. A third unknown, very large species of wolf spider, possibly representing one of the other undescribed endemic

[2] Dr Cairns-Wicks is an ecologist and conservationist who has lived on St Helena for more than 20 years, her PhD was on the population biology of *Trochetiopsis* spp. (Redwood and Dwarf Ebony); she began spider eye-shine surveys after the Ashmoles' visit and is the most experienced person to do this work on the island.

species, was found to the east of Stone Hill, adjacent to the Airport fence. Both the author and Dr Cairns-Wicks were surprised at the density of these predators in such an arid environment, indicating that prey species were available in high enough numbers to support such a population. One Prowling wolf spider caught a specimen of the endemic muscid fly *Limnophora helenae* while being observed, and a couple of others were seen attempting to catch moths of endemic *Opogona* sp.

Comparative photographs from a survey with Dr Cairns-Wicks in 2011 and one taken during the current survey are given in Figure 12. It can be seen that the two images seem to show roughly similar numbers of spiders present, although there is no scale information to determine this precisely. Photographs of some of the endemic species are shown in Figure 13.

FIGURE 13: Wolf spiders from the spider eye-shine survey.
A – Lurking wolf spider (?*Trochosippa* sp.); B – Lurking wolf spider hole; C – Unknown large wolf spider; D – Prowling wolf spider (*Hogna nefasta*) with a female *Limnophora helenae* as prey.

It was also found that while the reflected colours of the eyes vary, and includes white, green, red and blue, this is not specific to individual species or even families of spider. On a couple of occasions it was noted that the colour of a particular spider's eye changed while observing the specimen. This phenomenon is probably therefore to do with the diameter and depth of the particular eyes being reflected and refracted back at the observer, and as spiders have four sets of eyes, generally of varying sizes, this is the probable cause of the different colours being observed.

It seems that the populations of Prowling and Lurking wolf spiders in this area are doing well, and it was decided not to undertake any further sampling of these species as some, at least, are very scarce and threatened. Unnecessary sampling in this area could seriously harm populations of the rarer species and it is

recommended that funding for a PhD be sought to address the remaining taxonomic issues and attempt to understand the ecology of spiders across St Helena.

E – VEGETATION SURVEY

Full results from the vegetation survey are presented in Appendix H. The main species and habitats present, with their associated DAFOR abundances at each of the nine sites from the main survey are given in Table 5 below.

Site	Species
UBG	Samphire (F), Bare earth (F), Ice plant (O)
SO	Bare earth (A), Samphire (F)
CPW	Bare earth (A), Samphire (O)
BYD	Bare earth (A), Samphire (F), Ice plant (O)
WS	Bare earth (A), Samphire (O), Fishbone grass (O)
SBS	Bare earth (F), Samphire (F), Fishbone grass (F)
SP	Fishbone grass (A), Bare earth (F), Ice plant (F), Samphire (O)
SA	Rocks with crevices (A), Bare earth (F), Common saltbush (F), Creeper (O), Dead Creeper (O)
CBE	Bare earth (D), Samphire (O)

TABLE 5: The major species and habitat types present at each of the nine sites from the main survey. Abundances of more important species and habitats given using the DAFOR scale: D – dominant, A – abundant, F – frequent, O – occasional; rare species (R) omitted.

The most important species for endemic invertebrates in the survey area is Samphire (*Suaeda fruticosa*), a species restricted to the Western Cape area of South Africa and St Helena (Lambdon, 2012). Overall this is the dominant plant species present across the survey area. There are numerous endemic invertebrate species associated with it, these include the weevils *Microxylobius westwoodi* and *Acanthinomerus armatus*, the fungus weevils *Homeodera longefasciata* and *H. coriacea*, the wood-boring beetle *Xyletomerus armatus*, and the true bug *Hirtopsallus suedae*. All of these (excepting *X. armatus*) are in endemic genera, which suggests that Samphire is truly indigenous and has been present on St Helena for a very long time prior to the arrival of people (Ashmole & Ashmole, 2000).

One particularly important observation during the survey was that, with the onset of 'summer' and the associated dieback of annual herbs, rabbits began grazing on Samphire, in particular the bark of mature stems, causing damage and dieback. Rabbits were found to be widely present across the site, often disturbed by the author while sleeping under Samphire during the day and visibly active across the site during the spider eye-shine surveys at night. The soft substrate present in the survey area means that this is one of the few parts of the island where the excavation of warrens is possible, and several of these were observed across the site.

The ecological relationships of other plants present in the survey area to specific invertebrates is less clear. Common saltbush (*Atriplex semibaccata*) appears to be associated with potentially indigenous species, in particular the true bugs *Nysius ericae* and *Creontiades pallidus*. No particular species appear to be directly associated with either Fishbone grass (*Eragrostis cilianensis*) or Creeper (*Carpobrotus edulis*), both widely present across the site. All three of these plants do, however provide shelter, moisture and material for generalist detritivores, including mites, and should not be seen as problematic at the site; Creeper flowers additionally provide a good food source for generalist pollinators such as the mucid fly *Limnophora helenae*.

When collecting the Berlese sample at site R4 (Stone Hill Summit) dead stems of St Helena goosefoot (*Chenopodium helenense*) were specifically included as it was hoped they might harbour rare endemic taxa; nothing of particular importance was found.

Six invasive, non-native species, specifically Tungi (*Opuntia ficus-indica* and *O. vulgaris*), Willow (*Acacia longifolia*), Lantana (*Lantana camara*), Wild mango (*Schinus terebinthifolius*) and Tree tobacco (*Nicotiana glauca*), were noted at several locations and should be removed from the area.

F – MALAISE TRAP

A total of 103 taxa were recovered using the Malaise trap. The vast majority of specimens (53.85%) are of the endemic muscid fly *Limnophora helenae*, which is by far the most dominant species of fly present on Prosperous Bay Plain. While this technique has yielded no extra endemic species for the area, it provides by far the most useful quantitative data for the temporal survey (this results from the fact that the support poles were left *in situ* so the trap was erected in exactly the same position for each sample, and for exactly the same length of time; in the other methods used during the survey there is always a slight possibility that unconscious sampling bias might creep in in the placing of pitfall traps etc.). This method is also particularly good for adding many other non-endemic species to the site list that are usually present at very low density or easily missed using other survey techniques. Of particular interest was the sudden increase in numbers of the scarce endemic asteiid fly *Anarista vittata* in the fifth and sixth samples (see below). A comparison of the data from this trap with that from the DPLUS040 is given in the section on the assessment of sampling effectiveness, below.

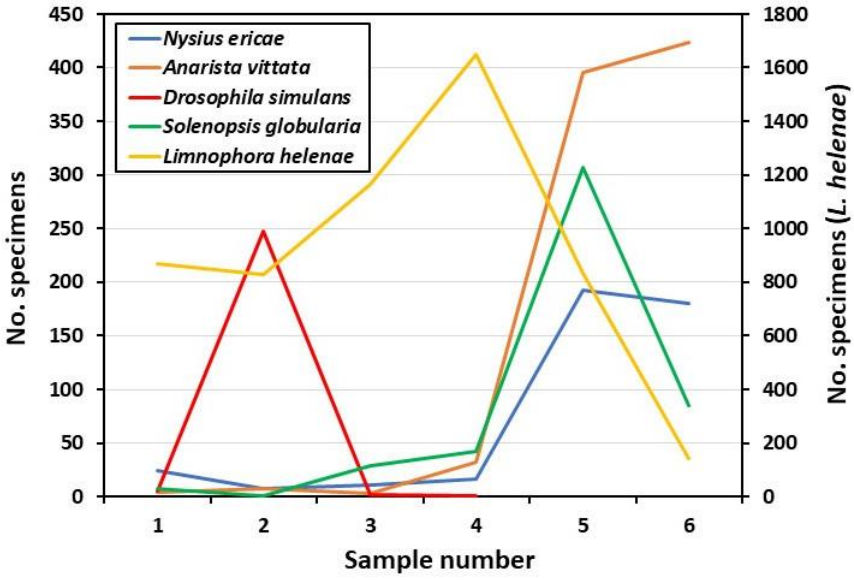

FIGURE 14: Some examples of invertebrates showing seasonal changes in abundance from the Malaise trap. It should be noted that the numbers for *L. helenae* are plotted on the left axis for ease of comparison, as numbers were so much higher for this species.

Quite a few species present exhibited seasonal changes in terms of numbers collected over the period of the survey; graphs for five more common species are shown in Figure 14. It can be seen that there is no one seasonal change that happens across the board, with numbers of the fly *Drosophila simulans* peaking near the start of the survey and entirely absent later. *L. helenae*, present in huge numbers through most of the survey, suddenly declined towards the end. Three other species, the true bug *Nysius ericae*, the fly *Anarista vittata*

and the ant *Solenopsis globularia*, peaked towards the end of the survey; it should be noted that nearly all of the specimens of *S. globularia* were winged queens and males. There is still an awful lot to be learned about the seasonal abundance of species on St Helena; it is hoped that some of the more complex analysis undertaken on the results of the DPLUS040 survey will go some way towards answering some of the many unanswered questions in this area.

G – General species information

Information on the most interesting findings from the survey is presented below. A species-by-species breakdown, with more detailed information, is given in Appendix I.

Mites

Specimens apparently referable to five species of endemic mite were collected. ?*Chausseria benoiti*, ?*C. sanctaehelanae*, ?*Bdellodes parvisetosa* and ?*B. quadrisetosa* were found during the main survey with seven specimens from pitfall traps and one from Berlese extraction. Additionally a single specimen ?*C. benoiti* and ?*C. dissimilis* were found in pitfall traps at Stony Outwash in samples 3 and 5 of the temporal survey respectively. *B. parvisetosa* was the only mite recovered during the 2003 survey. These identifications should remain tentative until confirmed by a taxonomic specialist in the group (though no taxonomic specialist has been contacted, or is even known to be interested in these species at present); however, this indicates that more of the endemic species may be surviving in the area than previously thought. If correct, these are the first records of four of these species since they were collected by the Belgians (Basilewsky, 1977). These specimens will be retained for study by future researchers in the island's invertebrate reference collection.

Pseudoscorpions

A single specimen of the pseudoscorpion *Hemisolinus helenae* was recovered from a pitfall trap at site Central Plain West, this, again, has not been seen since the first specimens were collected by the Belgians (Basilewsky, 1977). This species and the mites listed above are all apparently confined to Prosperous Bay Plain.

Araneae (spiders)

Probably the single most important discovery to date from the temporal survey has been two specimens of Napoleon's crab spider (*Bonapruncinia sanctaehelenae*). A single female from a Berlese extraction sample at Stony Outwash during temporal sample 2 and a male from a Berlese extraction sample at Stony Area during temporal sample 5; these sites are approximately 400 m apart. This endemic genus and species was described following the two Belgian expeditions, from two immature female specimens collected at 'Sud de la Prosperous Bay Plain' on the 26th November 1965 (Basilewsky, 1977). The species is very distinctive and is separated from the other crab spiders on the island by the presence of an angular shelf that projects above and in front of the anterolateral eyes. In the two Belgian specimens the combined length of the cephalothorax and abdomen was 3.1 mm, in the current specimens are 3.2 mm (male) 5.2 mm (female) and are shown in Figure 15; the colour pattern also matches that shown in the 'Faune Terrestre' (Figure 16), which also shows the angular shelf in greater detail.

In general, not many spiders were encountered during the survey. All that were collected were identified to species level where possible, but this was often not possible for juveniles. The Ashmoles had a particular interest in this group, and this might have led to unconscious bias in their sampling towards the group. The general ethos of the current survey has been to try to take samples in a totally unbiased manner, sticking as

rigidly to the sampling protocol as possible in the field on any given day, in order to make the samples as directly comparable as possible. The spider eye-shine surveys went some way to address this, showing that there is a healthy (indeed thriving) population of the group present in the Central Basin, but no specimens were taken in order to minimise the chance of harming fragile populations of the rarer species. The spiders of the island are known to require taxonomic revision, a task best undertaken by a specialist researcher; so further research into this group is best left until a taxonomic specialist is available to do it.

FIGURE 15: Photograph of mature *Bonapruncinia sanctaehelenae* male (left) and female (right); scale in mm.

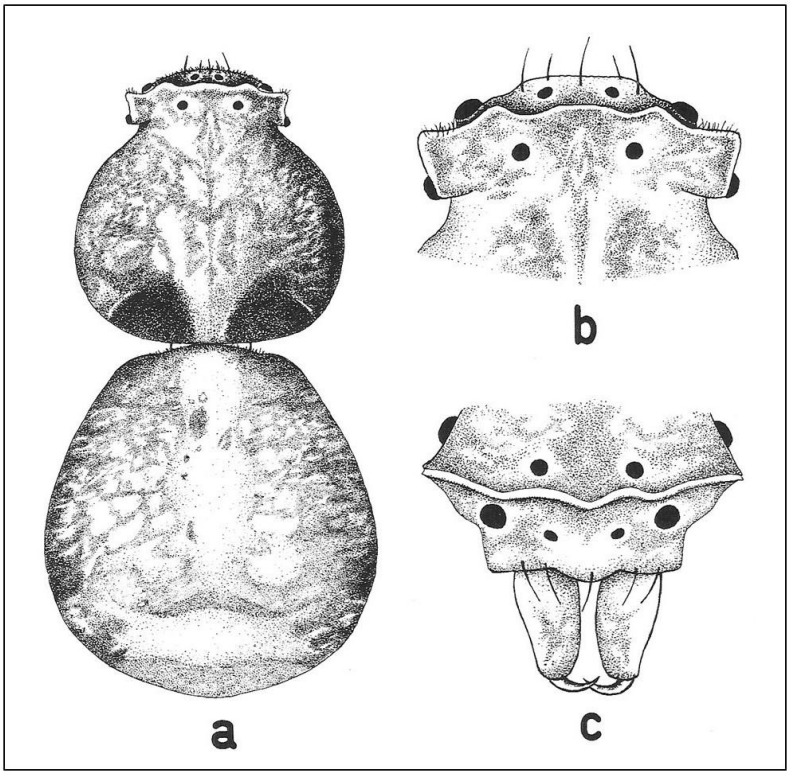

FIGURE 16: Drawing of *Bonapruncinia sanctaehelenae*, reproduced from Basilewsky, 1977.
a, dorsal view; *b*, dorsal view of the top of the head; *c*, fronto-dorsal view of the head.

Coleoptera (beetles)

The three most important beetle families at the site are the weevils (Curculionidae), fungus weevils (Anthribidae) and darkling beetles (Tenebrionidae). All of the weevil species found during the survey were those to be expected to be found in the area, and populations of these appear to be generally healthy. Prior to this survey the fungus weevil *Homeodera longefasciata* was only thought to be present at Upper Bone Gully and Stony Outwash; while not recovered at the first of these sites, it was collected again at Stony Outwash and was also found at Basin Yellow Dust, Central Plain West, Stony Area, Samphire Plain, Widow Slope and sites R3 and R5. This indicates that the species is much more widely distributed than previously thought and gives hope that it may well be present at other sites in the Eastern Arid Area (it was previously also known from Holdfast Tom and Horse Point).

Of greatest concern are the darkling beetles. Of the six endemic species known to have been present in the area only two, *Tarphiophasis decellei* and *T. leleupi*, were recovered during the current survey. All of the specimens of *T. decellei* (one from WS and three from CBE) found during the main survey were dead, although six live adults were found quite recently during the Airport DVOR survey (Pryce, 2016); it was also found at CPW during the Ashmoles' survey. Only five live adults of *T. leleupi* were found during the current survey, at SA (two) and CBE (three), all during the temporal survey; a total of 12 dead adults were found at sites CBE, WS and R5 during the main and temporal surveys. *T. insulanus*, found at SBS during the Ashmoles' survey, was not found during the current one. *Pseudoleichenum benoiti*, found at BYD CBE, CPW, SBS, SP and WS, during the Ashmoles' survey, by Liza Fowler at WS in 2016 (one specimen), and during the DVOR fence line survey (one specimen from a Berlese sample, two sight records), was not found at all during the current survey. Of the remaining two species (*Helenomelas basilewslyi* and *T. wollastoni*), both of which were only known from the Central Basin, no specimens have been found since the two Belgian expeditions. Bearing in mind the large number of specimens collected by the Belgians, this points to a catastrophic decline in these species over the last 60 years. It is possible that over-collection during the Belgian surveys contributed to their decline, but as adults are generally found under larger rocks with crevices under them, they are particularly vulnerable to predation by the centipede *Scolopendra morsitans* and the gecko *Hemidactylus frenatus*. As some of these species seem to have occurred at the more eastern part of the site, Airport construction can not be ruled out as a factor in the decline of these species. Further survey work to the east of the Airport is recommended.

Psocoptera (barkflies)

Two of flightless species of psocoptera have been identified from the temporal survey. The first is all grey and has minute wings. A single female of this species was found at Stony Outwash during the collection of temporal sample 3; this has the potential to be a new undescribed endemic species. A second species has a pale body, dark head and is brachypterous rather than macropterous – the wings have internal venation, but are much shorter than the abdomen; two specimens were found, one from Berlese sample 3 from Stony Area and a second from a pitfall trap at site R4 (Stone Hill Summit); several further specimens were found during the main survey, one and two again respectively from Berlese samples at Stony Outwash and Stony Area, and a fourth from a Berlese sample at Widow Slope. Another specimen of this second species was observed at the author's house during the survey. It is suspected by the author that this is either a new non-native arrival, or potentially a brachypterous form of one the species already present that has hitherto gone unnoticed. The last time the author contacted the acknowledged expert on this group on St Helena, Charles Lienhard of the Natural History Museum of Geneva, he replied that he was currently too busy with other projects to work on St Helena material at the moment, so these two species will have to remain enigmatic for the time being.

Lepidoptera (butterflies and moths)

The most important group of moths present in the survey area are the species in the genus *Opogona*, one of the largest adaptive radiations on the island, with 29 described endemic species. While a few distinctive species can be readily identified, the majority are almost impossible to identify at the current time due to the presence of about 10 known undescribed species, plus others that may be cryptic. Timm Karisch of the Museum für Naturkunde und Vorgeschichte, Dessau, Germany, is currently undertaking a revision of the genus and it is hoped that a monograph will be published in the next few years.

At least two species were recovered from the Malaise trap, both fully winged, one greyish and one creamy white. A minimum of two further species were recovered from pitfall traps across the site; both were brachypterous, one with longer and one with shorter wings. A single female specimen of a third brachypterous species (Figure 17) was recovered from a suction sample near the summit of Stone Hill on 24/12/2018; this specimen was remarkably fat when compared to the other species present in the area and resembles a first or second instar Ghost cockroach (*Balta longicercata*). Unfortunately, the specimen was collected into isopropyl alcohol so is unsuitable for DNA analysis. A further attempt was made to find a second specimen of this species on 05/03/2019, but failed to locate any. Timm Karisch (pers. comm.) is planning to visit Philip and Myrtle Ashmole in June this year to examine their specimens and hopefully recover DNA samples. It is believed that there are further specimens of this rare species present in their collection. Should this work fail to recover a DNA sample of this species, it is recommended that a further attempt be made to locate another one at a calendar date just prior to the collection of the current specimen, preferably in similar weather conditions, in order to maximise the likelihood of describing this species with the highest precision possible.

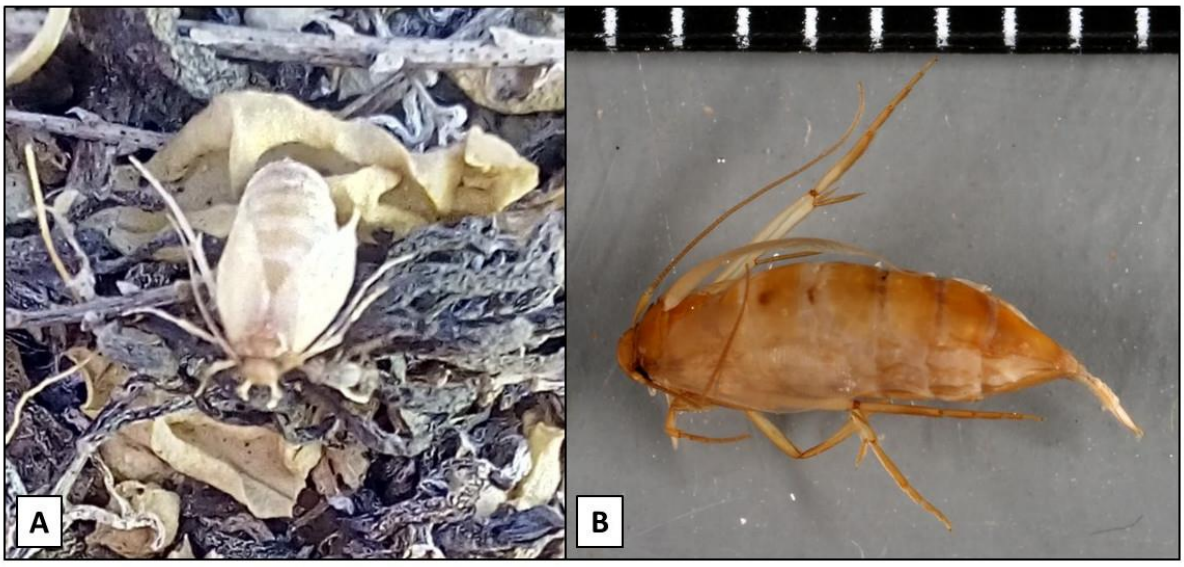

FIGURE 17: Probable new species of *Opogona* from the Stone Hill BugVac sample.
A – photograph of live specimen (courtesy of Lourens Malan), B – specimen in alcohol (scale in mm), note shrivelled nature of wings when compared to live specimen)

Diptera (flies)

The scarce endemic asteiid fly *Anarista vittata* was found at Basin Yellow Dust, Stony Area, Stony Outwash, Upper Bone Gully, Widow Slope and in the Malaise trap. The use of suction sampling (BugVac) has been found to be a very efficient method for locating this species. The species was collected in the Malaise trap each time it was operated, the number of specimens from the six samples processed being sequentially 4, 8, 3, 32, 396 and 423; these last two samples show that the species can be seasonally abundant and may therefore be

overlooked at many sites. It should also be noted that in life this species appears almost identical to the psocid *Ectopsocus strauchi* to the naked eye, which also occurs in the same habitat, and it may well have been overlooked in 2003.

The Prosperous Bay Plain parasite fly (*Atlantomyia nitida*), a scarce endemic species in the family tachinidae, was not found during the current survey. This species is slightly enigmatic; it was initially described from 14 specimens collected by the Belgians on 29/04/1967 (4 males) and 06/05/1967 (9 males, 1 female). It was found here again during the Ashmoles' survey, and again during the 2005-6 Peaks survey, where it was also found at the Scrubwood site near King and Queen Rocks and, most surprisingly, Mount Actaeon and The Depot, which are cloud forest sites. Seven specimens were found in the fifth Malaise trap sample from this site in the DPLUS040 survey, and it was apparently also found once at the Pink Grove site during the same survey. This information points to the probability that this species is quite seasonally restricted, and may be present at extremely low density, responding to the seasonal abundance of host species, probably larger caterpillars.

Hymenoptera (bees, wasps and ants)

The wingless endemic bethylid wasp *Sclerodermus insularis* (Figure 18A) was found at Central Plain West, Stony Area, South Basin Samphire, Stony Outwash, Samphire Plain, Upper Bone Gully and in 'random' samples R3 and R5. Nearly all specimens were collected by Berlese extraction. A single female of the second species of this genus, *S. wollastoni*, was found in a Malaise trap during a survey of Fisher's Valley in February 2016. However, the third species in the genus, *S. sanctaehelenae*, has not been seen since the Belgians found it in 1967 (Basilewsky, 1976); this may yet still be present as the Belgian's specimen was collected on the 25th of February, so it may be found by sampling later in the year.

A second, apparently previously unrecorded, wingless parasitic wasp, between 1.5 and 3 mm long and probably in the family Braconidae (Figure 18B) was found at Basin Yellow Dust, Central Plain West, Stony Area, South Basin Samphire, Stony Outwash, Samphire Plain and Upper Bone Gully and also in 'random' sample R1. All specimens are female, indicating that the species is probably parthenogenetic. It seems staggering that this species has not been found before; however, the fact that it is flightless and apparently restricted to Prosperous Bay Plain means that it is either a previously unrecorded endemic species or is a new invasive species that has arrived during the construction of the Airport. The balance of probabilities points to the former rather than the latter; further research into this species is advised.

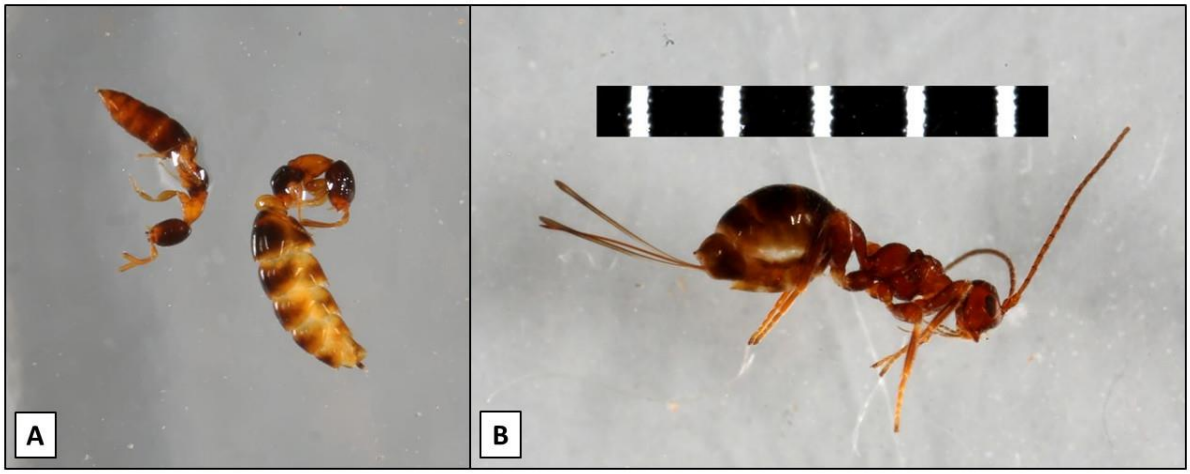

Figure 18: Two wasps from the survey.
A – *Sclerodermus insularis* male (left) and female (right), average length 1.3 mm; B – potential new wingless wasp species (a particularly large female), scale in mm.

The recording of the ant *Hypoponera* sp. (*sensu* Wetterer *et al.*, 2007), previously known from Lot, Potato Bay and Flagstaff, at the Upper Bone Gully site, is interesting. The exact status of this species is still unresolved and, until this has been done, little can be suggested as to its potential impact in the area. If it is an invasive non-native species colonising the area for the first time, it will put additional pressure on endemic species present by direct predation; however, there is also the possibility that this is a hitherto unrecognised endemic species (as evidenced by its unusual island distribution).

Information on the ant species recorded at each site during the two surveys is given in Table 6. It appears that Emery's sneaking ant (*Cardiocondyla emeryi*) has increased its range in the survey area, being found at two sites in the 2003 survey and six during the present one. It also appears that the Robust crazy ant (*Nylanderia* (ex *Paratrechina*) *bourbonica*) is being outcompeted by a similar species, the Longhorn crazy ant (*Paratrechina longicornis*), across the site; *N. bourbonica* was found at two sites during the 2003 survey but not during the current one; *P. longicornis* was found at a single site during the 2003 survey and seven sites during the current one. The Fire ant (*Solenopsis globularia*) was the only species found at all sites during both surveys. It can be concluded that there are ongoing shifts in the proportions of ant species present at the site, and there may be some evidence that more aggressive species (especially *P. longicornis*) are out-competing less aggressive species in the area. The arrival of further aggressive species at the site would continue to add additional pressure on endemic species present through direct predation, so vigilance with regard to biosecurity, both at the border and internally on the island is recommended.

Species	UBG (2003)	SO	CPW	BYD	WS	SBS	SP	SA	CBE	UBG (2018)	SO	CPW	BYD	WS	SBS	SP	SA	CBE
Cardiocondyla emeryi	*		*							*			*	*	*	*		*
Hypoponera sp.										*								
Nylanderia bourbonica					*			*										
Paratrechina longicornis	*									*	*	*		*	*		*	*
Pheidole meegacephala	*	*	*						*	*								
Plagiolepis alluaudi	*																	
Solenopsis globularia	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Tapinoma melanocephalum			*					*			*			*			*	

TABLE 6: Ant species present across the main survey sites during the 2003 and 2018 surveys.

ANALYSIS OF SAMPLING EFFECTIVENESS

Sampling effectiveness was assessed using EstimateS v.9.1.0 statistical software for analysis of species richness and shared species (Colwell, 2013). This program produces synthetic species accumulation curves from the data collected. It is then possible to use the slope of the curve to assess how successful the survey has been at finding the species present and also fit a trendline in Microsoft Excel, then, using the associated R^2 and trendline equation, estimate the effectiveness of the survey by projecting the data. Either logarithmic or power trendlines are used to compare sites (whichever produces the higher R^2 value) for a particular site. Note that the initial value for 'sample 1' is not graphed in each of the curves; including this value severely affects the fitting of the trendline, for the worse.

Synthetic species accumulation curves for the main survey are shown in Figure 19. The curves for all species (upper graph) are sub-parallel, indicating that, had both surveys been extended, they would have yielded additional species at a similar rate. When calculated for endemic species only, it can be seen that the current survey initially found a slightly higher number of species, but this declined, and after sampling five or

more sites, the current survey has yielded additional endemic species at a lower rate than the 2003 survey, which is paradoxical considering the data given above with respect to the number of species actually found at each site. More in-depth statistical analysis, beyond the scope of the current report, would be required to understand the mechanisms involved here.

Data calculated for the Malaise traps operated during the DPLUS040 and the current surveys show a similar trend (Figure 20). The curve for all species shows that the current survey is adding additional species at a greater rate than that from the DPLUS survey. However, when recalculated for endemic species only, it can be seen that the current survey is adding additional species at a lower rate than the DPLUS survey, and, had they both been continued, the DPLUS survey would have eventually found more endemic species. This is possibly an artefact of the location of the traps. The DPLUS Malaise trap was positioned in a very exposed location on PBP and the current Malaise trap is in a sheltered location in an incised valley. The DPLUS Malaise trap would therefore have caught more wind-blown individuals than that at the site used during this survey, which, as a consequence of its location, would be more likely to trap the species only present in the immediate vicinity.

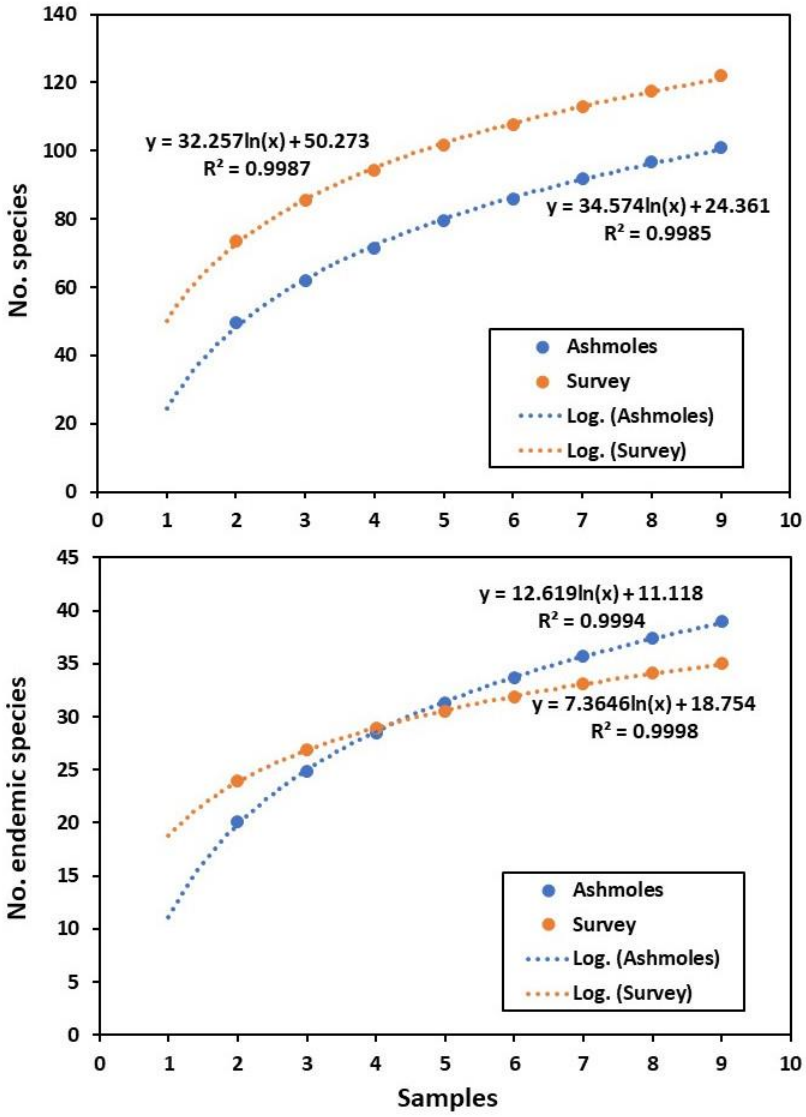

FIGURE 19: Synthetic species accumulation curves produced using EstimateS software for the main survey.

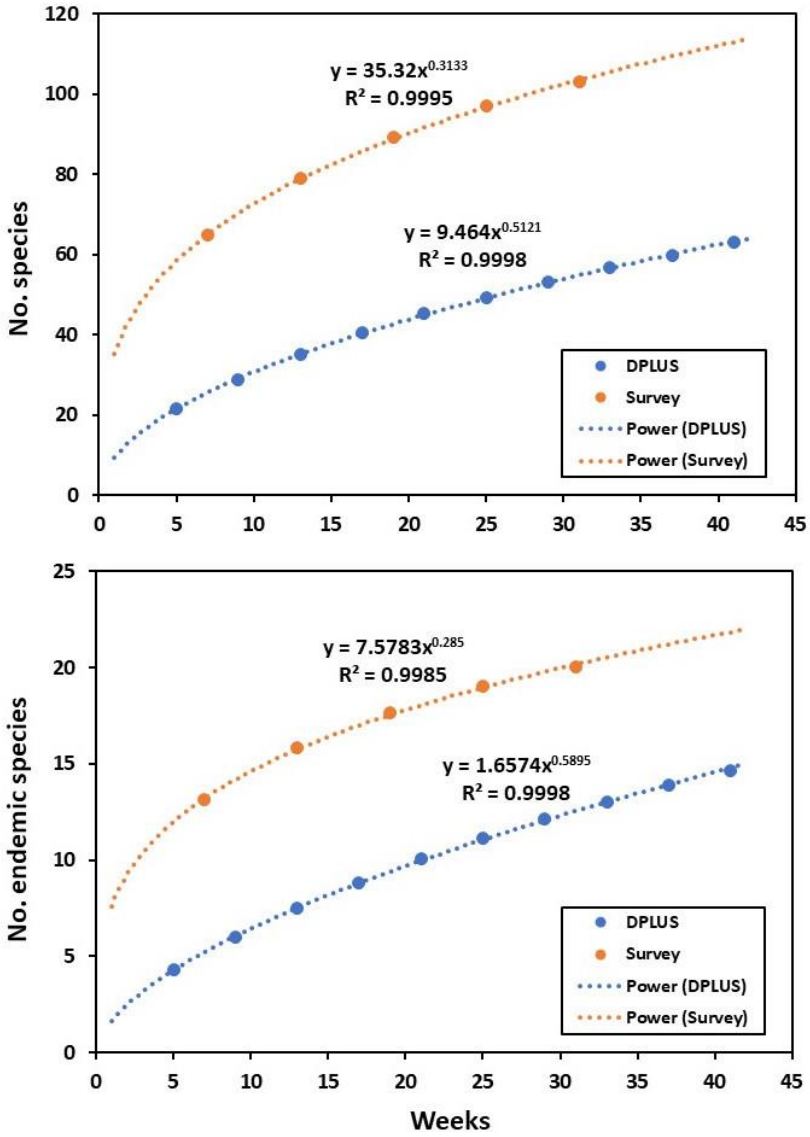

FIGURE 20: Synthetic species accumulation curves produced using EstimateS software for the Malaise traps from this survey and DPLUS040.

RECOMMENDATIONS

There are no specific recommendations that can be made to enhance the site for specific invertebrate species, as precise ecological data to complete this without the use of advanced of statistical analysis is lacking. However, the following recommendations will improve general habitat quality and should enhance the site for endemic invertebrates at the site:

- Removal of invasive plant species. It is recommended that all Tungi (*Opuntia ficus-indica* and *O. elatior*) be removed from the Central Basin, and additionally between this area and the Airport access road, preferably beyond – if possible. There is one small Wild mango (*Schinus terebinthifolius*) adjacent to the derelict Diplomatic Wireless Station building, this should also be removed. A small area of *Lantana camara* was found towards the north-east of the zone around WGS84 UTM 0216352 8234157 (approximately 10 plants), with more plants also being present in the ravine to the north-east of the survey area; these should also be removed. The remaining few Port Jackson willow (*Acacia longifolia*) bushes present to the north of the Airport access road, along the southern edge of the zone should also be removed. There are additionally one or two *Lantana* and Tree tobacco (*Nicotiana glauca*) plants at the head of Upper Bone Gully that should also be removed.
- It is highly recommended that Rabbit control be undertaken across the site and in the wider area. This should reduce damage to Samphire (*Suaeda fruticosa*), the most important host plant for endemic invertebrates at the site, during drier spells when alternative, more palatable species are unavailable. Attempts to reduce or eradicate the species should be modelled on those currently being judged to deliver successful control in similar environments elsewhere. It is further suggested that public awareness of the damage being done by this species should be raised by the release of suitable press releases.
- Vehicular access to the area should be further restricted. It is recommended that a chain be placed across the gully at WGS84 UTM 0215662 8234228, closed with an Airport padlock to allow access to vehicles in case of an emergency. A 'no off-road driving' sign should also be placed below the 'sharp bend' sign just past Prosperous Bay Plain layby when heading towards the airport. Positioning of further large rocks in this area should also act as a deterrent.
- The gecko survey has shown that this is a viable method for attracting this species, particularly during warmer weather. It is recommended that the sheets be left *in situ* and periodic gecko removal be undertaken in an attempt to decrease predation of endemic species at the site. Precise timings and methodologies should be agreed with St Helena Government. It is also suggested that some public awareness information is put out to inform the general public how this species is detrimentally affecting the endemic fauna of the island.
- It is recommended that the interpretation board at WGS84 UTM 0215776 8234231 be replaced. The board itself is starting to degrade as a result of UV exposure, and much of the text and imagery are now out of date. It is recommended that any replacement be sought from the UK or South Africa, from a company that is able to produce material more resistant to UV exposure, and also that any replacement be placed vertically rather than placed at an angle (as at present), in order to decrease UV exposure. A particularly good supplier of high-quality sign-boards recommended by the author is Shelley Signs (www.shelleysigns.co.uk) who supply such boards to the Environment Agency in the UK.
- The Malaise trap situated near Stony Outwash is providing particularly useful data that can be further compared with that from the DPLUS040 survey. It is recommended that these be collected and analysed by the author, at six weekly intervals (an additional four samples beyond the end of this survey), so that a more detailed statistical comparison can be made.
- The spiders of St Helena are in urgent need of taxonomic revision. It is recommended that funding be sought for a PhD to research this critically important group of invertebrates. In addition to resolving the

remaining taxonomic issues using specimens both on- and off-island, plus additional specimens collected during the PhD itself, the research should also try to accurately map the species and attempt to unravel their ecology and habitat preferences.

- The spider eye-shine surveys were one of the more remarkable wildlife experiences the author has participated in; it should be considered as a possible tourist activity. In order to minimize habitat disturbance, it is recommended that funding be sought for a boardwalk which should be constructed from approximately WGS84 UTM 0215975 8234015, where the track to the south of Stone Hill diverges from the main track, to approximately 0216327 8233770, south-east of Stone Hill, a distance of approximately 430 metres. The boardwalk should preferably be elevated (at least 40 cm off the ground), to minimise the risk of geckos and the centipede *Scolopendra morsitans*) using it as a shelter. Should this be done, increased monitoring for rabbits that may potentially use the structure as a shelter should also be undertaken.
- Should it prove impossible to recover DNA from the specimens of the fat brachypterous moth of the genus *Opogona* (Figure 17) from specimens held by Philip and Myrtle Ashmole, it is recommended that one more attempt be made to locate a further specimen from the Stone Hill area. It is recommended that this be undertaken around or just before the date the current specimen was found (December 24), as no specimens were found after this date.
- Prosperous Bay Plain and the Central Basin do not exist in isolation, and are part of the much wider Eastern Arid Area. Additionally, there are other sites that have been significantly modified, or lost, as a result of Airport construction. It is therefore recommended that further survey work be undertaken at the other sites surveyed by the Ashmoles in 2003, plus collecting baseline data from restored sites to allow monitoring of restoration work in the future; these sites are given in Table 7 below:

Number	Name	Comment
3	Cliff Top	At eastern edge of Airport development – **resurvey**.
4	Earwig Gully	Lost to Airport development – do not resurvey.
6	Triangulation Point 71/21	Lost to Airport development – do not resurvey.
7	Gill Point, waterfall above	At foot of Dry Gut fill – **resurvey**.
9	Bryan's Rock	**Resurvey**.
10	Horse Point	**Resurvey**.
11	Government Flat Garage	**Resurvey**.
13	Signal House Ravine	**Resurvey**.
17	Plateau Triangulation Point	Lost to Airport development – do not resurvey.
18	Prosperous Bay Hinterland	**Resurvey**.
19	Prosperous Bay Gully	**Resurvey**.
21	Strange Rock Plateau	Lost to Airport development – do not resurvey.
23	Holdfast Tom Samphire	**Resurvey**.
–	Bradley's Camp area	**Survey**. Area around WGS84 UTM 0215603 8234827.
–	Area west of Airport car park	**Survey**. Area around WGS84 UTM 0216284 8233399.
–	Crusher plant and aggregate store area	**Survey**. Area around WGS84 UTM 0215977 8233495.
–	Tungi Flats and explosive store area	**Survey**. Area around WGS84 UTM 0215551 8233967.

TABLE 7: List of suggested sites for a repeat survey or baseline survey.
This list includes all of the Ashmoles' 2003 survey sites and indicates those that have been lost to Airport development.

CONCLUSIONS

The current survey appears to have been more successful than that of Ashmole & Ashmole, 2004; this is in respect to the total number of species recovered and the number of these that are endemic. The temporal survey, combined with information from the Malaise trap and that from the Malaise trap operated during the DPLUS040 project, indicate that seasonal changes in the fauna occur as a result of climatic variation through the island's 'seasons', although the precise drivers for this are still unknown.

There is no objective evidence to suggest that there are any significant changes to the fauna since the 2003 survey. These changes would only be determinable with precise collection information and numeric data that is not currently available from Ashmole & Ashmole (2003). The only location in the study area that shows a noticeable change in fauna since 2003 is Samphire Plain (SP), and also (possibly) South Basin Samphire (SBS); the causes of these changes are unknown.

While this survey recovered a lower percentage of endemic species than new (non-endemic) species per site, this is likely due to differences in sampling methodology, specifically the use of a Malaise trap, Berlese extraction and suction sampling using BugVac. There appears to be no evidence that the construction of the Airport adjacent to the site has had a significant impact on invertebrates present.

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The Government of St Helena, especially Kirsten Pritchard, who set up the survey, and the LEMP (Landscape and Ecology Mitigation Programme) now based at the St Helena National Trust should be thanked for the granting of the licence to undertake and the support to deliver the survey.

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The author would particularly like to thank those that undertook fieldwork with him, sometimes during challenging conditions, especially Lourens Malan and Rebecca Cairns-Wicks MBE. The Mantis Hotel is also acknowledged for providing a couple of rather fine meals while waiting for it to get dark enough to do the spider eye-shine surveys.

Gwyneth Howell, other airport staff and the police are thanked for site access permission liaison, particularly during the spider eye-shine surveys, as a large portion of the survey work was undertaken immediately adjacent to the airport fence.

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Should anybody feel that they've been omitted from this list, I most wholeheartedly apologise.

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APPENDIX A – HISTORY OF STUDY

The earliest in-depth entomological work on St Helena was undertaken by Thomas Vernon Wollaston (1822-1878). Wollaston had been receiving specimens sent from the island, initially from Calverley Bewicke and later from John Charles Melliss throughout the 1860s and early 1870s. He determined to visit the island and spent 5½ months here from early September 1875 to late February 1876. However, there are no records of any specimens taken in the PBP area in his monograph of the island's coleoptera (Wollaston, 1877), or any of his other publications, so the special nature of this area was then unknown.

The next, and most complete, systematic survey began when the Royal Museum for Central Africa (Tervuren, Belgium) took an interest in the island in the mid-1960s. They planned a major expedition to the island from 8 November 1965 to 23 January 1966 to compile a list of the terrestrial invertebrates (as complete as possible) and to explore their behaviour. It was found that the time allotted to the first expedition was not sufficient to examine all of the habits in detail – particularly the more arid areas, where it was believed that species became more abundant after the summer rains in January and February; consequently, a second expedition from 21 January to 4 June 1966 was undertaken. The data from these expeditions was published in the four-volume work '*La faune terrestre de l'île de Sainte-Hélène*' (Basilewsky 1970, 1972, 1976, 1977). While this work was ground-breaking in its scope and intent, it is mostly written in French (68%) with 29% in English and the remaining 3% in German. It is also to be regretted that they did not localise their collection data more precisely with the use of grid references, as all of their records are listed simply as 'Prosperous Bay Plain' or 'Prosperous Bay Plain, Southern', etc.

Further survey work took place in the area in 1994 during a six month visit by Philip and Myrtle Ashmole, who were researching subterranean invertebrates of this and other volcanic islands. This ultimately led to the production of their natural history book of St Helena and Ascension Islands (Ashmole & Ashmole, 2000).

Plans to build an international airport on the island had been talked about from the late 1930s, but did not gain traction until the turn of the millennium when it was realised that a replacement for the RMS St Helena would need to be sourced, and a plan to expand tourism on the island to help make the island more economically sustainable began to take shape. As there are limited places where a runway could be constructed on the island, and the majority of proposals were for it to be in the Prosperous Bay Plain area, it was found necessary to conduct a survey of sites in the 'Eastern Arid Area' to determine the current status and distributions of endemic invertebrates found there. To this end, Philip and Myrtle Ashmole were commissioned by St Helena Government (funded by the UK Foreign and Commonwealth Office) to conduct an invertebrate survey and produce a guide to the species present in the region (Ashmole & Ashmole, 2004a, 2004b); this data was incorporated into the feasibility study later published by Atkins (2005).

Philip and Myrtle Ashmole returned to the island with Howard Mendel from the Natural History Museum (London) in 2005-6 to undertake a survey of the cloud forest fauna of the peaks area; they stayed on after this project had been completed and undertook more survey work across the island, this information was also included in the 'Peaks report' (Mendel, Ashmole & Ashmole, 2008).

Immediately prior to airport construction a plant and invertebrate survey of areas where ground disturbance was anticipated in the southern part of the construction zone was commissioned by the Air Access Office of St Helena Government; this was published in March 2014 (Cairns-Wicks & Lambdon, 2014). Later, other surveys in this area were commissioned as and when the need arose by the Air Access Office or Basil Read (Airport contractor) these are:

- Invertebrate survey and mitigation reports for the Dry Gut Open Channel along the ridge to the south of Dry Gut (Pryce, 2013a, 2013b);
- An invertebrate and plant survey of the northern runway area, to the east and north east of the current survey area (Pryce & Paajanen, 2016);
- A snapshot invertebrate survey of an area where the airport fence line had to be altered near the DVOR installation (Pryce, 2016); this is at the easternmost edge of the current survey area.
- A Malaise trap was operated at the western edge of the Plain on a four weekly basis for approximately nine months as part of the Darwin Plus Project 'Securing the future for St Helena's endemic invertebrates' ('DPLUS040').

A series of maps showing the location of all known records and the sites studied by the various surveys, through time, and annotated with the number of species found at each site, is included as Appendix B.

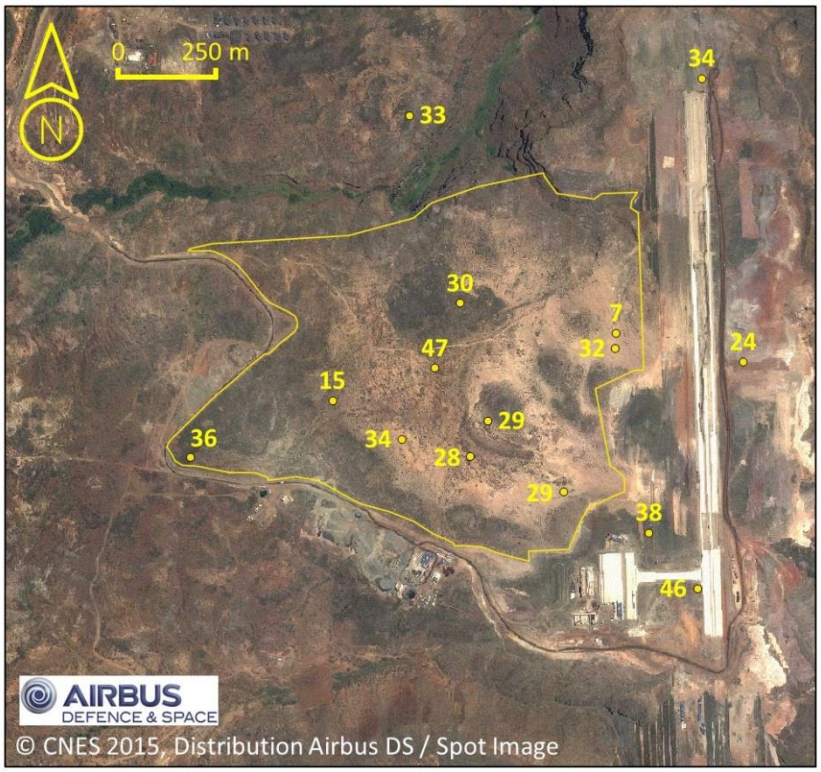
The DVOR fence line study was of particular interest as, although a very rapid assessment of a small area, an entirely new species of fungus weevil (*Homeodera* sp. 2), which is one of the most important and well-studied groups of St Helenian endemics, was found; this status has been confirmed by Howard Mendel of the Natural History Museum in London. The discovery of this new species indicates that there is still the potential to find new species in this well-studied area, and that some of the 'lost' species may yet still yet be relocated.

APPENDIX B – PREVIOUS SURVEYS.

The yellow dots on the map above show the locations of all invertebrate records from the Prosperous Bay Plain area. These may indicate anything from a single sight record to an in-depth survey location. Although most of these samples will have actually have been taken across a wider area than indicated, it is apparent that there are still areas that have not been well-sampled.

The maps below show the locations of sample sites that have been used during the various surveys that have been undertaken previously in the Prosperous Bay Plain Area. The numbers beside each location indicate how many invertebrate species were found at the site.

The Belgian expeditions, the uncertainty of location of each sample being indicated approximately by dashed lines (Basilewsky, 1970, 1972, 1976, 1977).



The Ashmoles' 2003 survey (Ashmole & Ashmole, 2004a, 2004b).
Also includes 53 species recorded in the survey area in 2006-7 (Mendel, Ashmole & Asmole, 2008)

The Southern Ridge Survey (Cairns-Wicks & Lambdon, 2011)

The North Runway Survey (Pryce & Paajanen, 2014)

The DVOR Fence Line Survey (Pryce, 2016)

Location of Malsise traps during the DPLUS040 survey.

APPENDIX C – GECKO SURVEY RESULTS

[**NOTE:** the survey panels were installed during temporal sample 1, results below being from temporal samples 2 to 5.]

Number of geckos located during temporal sample 2.

Number of geckos located during temporal sample 3.

Number of geckos located during temporal sample 4.

Number of geckos located during temporal sample 5.

APPENDIX D – PITFALL TRAP LOCATIONS

Stony Outwash (SO)

Pitfall #	Half-sample sample 1	Half-sample sample 2	Half-sample sample 3	Half-sample sample 4	Half-sample sample 5
1	0215836 8233869	0215835 8233876	0215837 8233876	0215837 8233881	0215837 8233882
2	0215838 8233871	0215837 8233876	0215840 8233877	0215840 8233881	0215841 8233882
3	0215843 8233869	0215838 8233874	0215841 8233878	0215842 8233882	0215842 8233881
4	0215843 8233871	0215839 8233871	0215844 8233878	0215844 8233881	0215847 8233881
Average	**0215840 8233870**	**0215837 8233874**	**0215841 8233877**	**0215841 8233881**	**0215841 8233882**

Stony Area (SA)

Pitfall #	Half-sample sample 1	Half-sample sample 2	Half-sample sample 3	Half-sample sample 4	Half-sample sample 5
1	0216143 8234103	0216583 8234006	0216142 8234106	0216138 8234105	0216136 8234105
2	0216144 8234103	0216581 8234008	0216142 8234103	0216140 8234102	0216136 8234101
3	0216145 8234101	0216582 8234009	0216143 8234099	0216141 8234099	0216138 8234097
4	0216146 8234097	0216581 8234010	0216144 8234097	0216144 8234096	0216138 8234095
Average	**0216145 8234104**	**0216582 8234008**	**0216143 8234101**	**0216141 8234101**	**0216137 8234100**

Central Basin East (CBE)

Pitfall #	Half-sample sample 1	Half-sample sample 2	Half-sample sample 3	Half-sample sample 4	Half-sample sample 5
1	0216585 8234004	0216586 8234007	0216582 8234012	0216574 8234021	0216570 8234031
2	0216583 8234003	0216585 8234007	0216580 8234012	0216574 8234022	0216569 8234033
3	0216582 8234005	0216586 8234008	0216579 8234013	0216575 8234022	0216567 8234034
4	0216583 8234006	0216585 8234009	0216579 8234015	0216573 8234023	0216568 8234035
Average	**0216583 8234005**	**0216586 8234008**	**0216080 8234013**	**0216574 8234022**	**0216569 8234033**

Sites R1-R5 – 'Random' samples

Pitfall #	Half-sample sample 1 North-east Tungi Flats	Half-sample sample 2 North-east-most basin	Half-sample sample 3 West of Mole Spider Hill	Half-sample sample 4 Stone Hill summit	Half-sample sample 5 Northern-most basin
1	0215654 8233995	0216532 8234282	0216315 8233976	0216257 8233861	0216211 8234297
2	0215657 8233996	0216524 8234282	0216312 8233970	0216258 8233863	0216213 8234300
3	0215656 8234002	0216215 8234288	0216319 8233970	0216259 8233865	0216205 8234299
4	0215653 8233999	0216513 8234290	0216321 8233960	0216260 8233867	0216207 8234302
Average	**0215655 8233998**	**0216521 8234286**	**0216317 8233969**	**0216259 8233864**	**0216209 8234300**

Ashmole's sites – main survey

Pitfall #	UBG Upper Bone Gully	SO Stony Outwash	CPW Central Plain West	BYD Basin Yellow Dust	WS Widow Slope
1	0125482 8233722	0125819 8233880	0215994 8233788	0216178 8233754	0216407 8233634
2	0125484 8233722	0125816 8233877	0215991 8233790	0216175 8233754	0216408 8233632
3	0125483 8233725	0125820 8233878	0215990 8233793	0216176 8233748	0216401 8233627
4	0125480 8233723	0125821 8233880	0215991 8233801	0216174 8233749	0216395 8233622
5	0125465 8233759	0125827 8233891	0216002 8233802	0216173 8233751	0216405 8233663
6	0125464 8233759	0125828 8233893	0216006 8233802	0216166 8233744	0216400 8233662
7	0125462 8233758	0125831 8233891	0216008 8233799	0216167 8233743	0216405 8233685
8	0125496 8233737	0125849 8233899	0216017 8233823	0216150 8233756	0216354 8233707
Average	**01254477 8233741**	**0125827 8233886**	**02156000 8233800**	**0216170 8233750**	**02164397 8233654**

Pitfall #	SBS South Basin Samphire	SP Samphire Plain	AS Stony Area	CBE Central Basin East
1	0216225 8233846	0216093 8233965	0216121 8234102	0216473 8234055
2	0216222 8233838	0216093 8233961	0216123 8234105	0216472 8234054
3	0216216 8233833	0216087 8233969	0216127 8234103	0216534 8233980
4	0216216 8233837	0216084 8233965	0216135 8234118	0216531 8233975
5	0216212 8233838	0216081 8233963	0216136 8234118	0216576 8234017
6	0216209 8233839	0216076 8233967	0216136 8234120	0216575 8234018
7	0216212 8233843	0216077 8233971	0216137 8234121	0216575 8234020
8	0216214 8233847	0216055 8233965	0216108 8234110	0216444 8234056
Average	**0216216 8233840**	**0216081 8233966**	**0216128 8234112**	**0216523 8234022**

APPENDIX E – MAIN SURVEY RESULTS

Key: HS – Hand searching; BV – BugVac; PF – Pitfall trapping; BE – Berlese extraction; P – Species present but no numbers recorded; ~ – approximate number recorded only.

Site			Upper Bone Gully				Stony Outwash				Central Plain West				Basin Yellow Dust				Widow Slope				South Basin Samphire				Samphire Plain				Stony Area				Central Plain East				Total
Method			HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	
Reptilia	Gekkonidae	*Hemidactylus frenatus*	P				P				P								P								P				P				P				7
Mollusca	Helicidae	*Cornu aspersum*	P				P				P				P				P								P								P				6
	Succineidae	*Succinea sanctaehelenae*	P				P																				P				P								4
Acari	Anystidae	*?Chaussieria benoiti*							1																												2		3
	Anystidae	*?Chaussieria sanctaehelenae*							1																												2		3
	Bdellidae	*?Bdellodes parvisetosa*			1																																		1
	Bdellidae	*?Bdellodes quadrisetosa*																																				1	1
	Scheloribatidae	*Scheloribates* sp.			4				~100	~350				~40				3				3			7	~75				~350	~30			4		1	10	6	~975
Araneae	Corinnidae	*Xeropigo tridentiger*	P				P			1	P			2				1		1		2					P				P				P			3	16
	Dictynidae	*Archaeodictyna condocta*					1		1		1				1				1											1	1						3		10
	Linyphiidae	*Agyneta prosectes*		14				5	2			4																											25
	Lycosidae	*Hogna inexorabilis*											1												2														3
	Lycosidae	*Lycosa elysae*															2												1										3
	Oecobiidae	Oecobiidae indet.			1				1				1						2		2				1							3			1			12
	Oonopidae	*Gamasomorpha insularis*			2								1								1								1			1	1					7
	Philodromidae	*Philodromus signatus*	4	5			3				3	2			2	3			2				1	2			2	2	1	1	2				2			1	38
	Salticidae	Salticidae indet.	3	3				1							1	2								6								3						19
	Salticidae	*Hasarius adansoni*	P								6						2				2		P		1								2						15
	Salticidae	*Pellenes inexcultus*	P		4				4				3				1		P		10		1		7		1		5		1		3		P		12		52
	Sicariidae	*Loxosceles rufescens*							1				1																		2								4
	Theridiidae	*Latrodectus geometricus*	P				P												P				P				P				2								7
	Theridiidae	*Steatoda capensis*																							1												1		2
	Theridiidae	*Steatoda* sp.	1																																				1
Pseudoscorpiones	Garypinidae	*Hemisolinus helenae*											1																										1
Isopoda	Platyarthridae	*Niambia capensis*						3																	1														4
	Porcellionidae	*Porcellionides pruinosus*	P		49		P		7		P	1	4				1		P		5				1		P		9		P		23				1		107
Diplopoda	Julidae	*Ommatoiulus moreleti*	P		28		P																								P		11						42
Chilopoda	Scolopendroidae	*Cryptops basilewskyi*																													3								3
	Scolopendridae	*Cryptops hortensis*							1																														1
	Scolopendroidae	*Scolopendra morsitans*									P																				3								4
	Scutigeridae	*Scutigera coleoptrata*																																			1		1
Collembola	Entomobryidae	*Entomobrya multifasciata*		7	16			8									2							1								3	17			4			58
	Poduridae	*Xenylla grisea*			1																																		1
Zygentoma	Lepismatidae	*Lepisma saccharina*																					P								P	1			1				4
Blattodea	Blattidae	*Periplaneta australasiae*																													P								1
	Corydiidae	*Euthyrrhapha pacifica*					P				P												P										1						4
Orthoptera	Acrididae	*Primnia sanctaehelenae*	P				P				P				P				P		1		P				P				P				P		2		12
	Gryllidae	*Gryllus bimaculatus*	P		1		P		1		P						1		P				P				P				P		1						11
	Mogoplistidae	*Cycloptiloides canariensis*		4	1																												1						6
Dermaptera	Anisolabididae	*Euboriella annulipes*	P						3																						P		4						9
	Labiduridae	*Labiduria riparia*					P																																1
Psocoptera	Ectopsocidae	*Ectopsocus strauchi*	17	4	1	1					1			2	1				2	3			1									1			1				35
	Liposcelidae	*Liposcelis* sp.																																3						3
	Myopsocidae	*Myopsocus eatoni*																							1					3									4
	Peripsocidae	*Peripsocus stagnivagus*				1								2								4																	7
	Trogiidae	*Cerobasis annulata*	22	12	1		27	23	3		4	2			17	15		1	11	7			17	4	1	1	6	2	1		17	5			18				217
	Trogiidae	*Helenatropos abrupta*																				1																	1
		Psocidae indet. (brachypterous)								1												1												2	1			1	6
Thysanoptera	Phlaeothripidae	*Haplothrips gowdeyi*	1		6		5	2		8	21	1	1	2	4	3	24		1	4	1	5		6	3	6		1	3	2	5	5	1	3		1		5	130
Hemiptera	Anthocoridae	*Cardiastethus bicolor*	11	10	1	1		2		2	1	2			1	10		1	1	4			1	1			2	4		1								56
	Anthocoridae	*Cardiastethus exiguus*	1																																				1
	Anthocoridae	*Orius thripoborus*	4				11								2				4												4				2				27
	Aphididae	*Aphis craccivora*																																	1				1
	Cicadellidae	*Balclutha saltuella*	1																																				1
	Cydnidae	*Aethus pallidipennis*			1								1				1				1				2														6
	Diaspididae	*Diaspis echinocacti*	P																																				1
	Lygaeidae	*Nysius ericae*	12	1	1		1		1		5	1			2				11	1			1	5			6	1			3	6	5		9				72
	Lygaeidae	*Nysius sanctaehelenae*	2	2	2						4	1			7	4			2								3	1	1										29

	Miridae	*Creontiades pallidus*		4			14	1											3				8	4				2			5	3			4				48
	Miridae	*Hirtopsallus suedae*					2										1						1				1				3	2				1			11
	Miridae	*Trigonotylus tenuis*	1																																				1
	Nabidae	*Tropiconabis* capsiformis	6	1	1				1																														9
	Tingidae	*Teleonemia scrupulosa*	P																																				1
Neuroptera	Chrysopidae	*Chysoperla zastrowi*	14	1			7	2				4	2		2	1	1			1							1	2			2	1							41
Coleoptera	Anthicidae	*Anthicodes fragilis*					2						7	2	5		2		12		37		P		2				13	8	2				1		6	1	100
	Anthribidae	*Homeodera alutaceicollis*	22	5		2	4	3	1		19	1			36	6		8	7				11	2		7	51	1		2	16				7		1	1	213
	Anthribidae	*Homeodera longefasciata*					6		2				12	20				2				18							2	28	1								91
	Carabidae	*Calosoma chlorostictum*	P		2		P				P								P				P				P				P		1						10
	Carabidae	*Harpalus sanctaehelenae*																																		1			1
	Carabidae	*Laemostenus complanatus*			1																										1								2
	Chloropidae	Chloropidae indet.	1																																				1
	Coccinellidae	*Cheilomenes lunata*	1	1							P								P				1																5
	Coccinellidae	*Exochomus flavipes*														1			1				8		1		5	1			1				5				23
	Coccinellidae	*Scymnus nubilus*	8				2									2			1	1			3	1															18
	Curculionidae	<u>*Acanthinomerus armatus*</u>				9				1		1		3		2		4	1		1	121				1		1		3		4	1	2				23	178
	Curculionidae	*Isotornus proximus*			1	1	1					1		20				32				35				1		1	2	2	1	2		4					104
	Curculionidae	*Microxylobius westwoodi*	17			5	10	1		34	20	2		70	5	8		16	1	1	1	5	11			15	8	2		25	15	16		2	17	1		40	348
	Curculionidae	*Pericartius aequatorialis*	1			3				2				3				8				8				3				9									37
	Ptinidae	*Xyletomerus insulanus*									1												1				1			1									4
	Sarcophagidae	*Sarcophaga* sp.																	P																				1
	Scarabaeidae	*Mellissius* sp.					P				P								P												P								4
	Sphaeroceriade	Sphaeroceriade indet.		6																																			6
	Staphylinidae	Staphylinidae indet. (small)			1																																		1
	Tenebrionidae	*Gonocephalum simplex hadroides*	P										2								9				3		P		2		P		2						21
	Tenebrionidae	*Hemasodes batesi*																															1						1
	Tenebrionidae	*Tarphiophasis decellei*																	1																3				4
	Tenebrionidae	*Tarphiophasis leleupi*																	6																				6
Lepidoptera	Crambidae	*Spoladea recurvalis*	P				P								P				P								P												5
	Erebidae	*Ophiusa tirhaca*			1				1																								1						3
	Geometridae	*Scopula separata*	1																																				1
	Pyralidae	*Cactoblastis cactorum*	P																																				1
	Tineidae	*Opogona* sp.		2	48	2	1	1	28				5	3			15		P	2	54	3	P	1	4		P	1	5	1	1	1	9		1	1	9	1	~200
Diptera	Agromyzidae	?*Phytomyza atricornis*					5																																5
	Asteiidae	*Anarista vittata*		6			1									4				1											1	4							17
	Chloropidae	*Elachiptera sacculicornis*														1																							1
	Dolichopodidae	*Syntormon pallipes*		1																																			1
	Drosopilidae	*Drosophila repleta*			10				1				1																										12
	Drosopilidae	*Drosophila simulans*			8																																		8
	Ephydridae	*Scatella septemfenestrata*	1																																				1
	Ephydridae	*Psilopa* sp.		3			2	1	1			11	1		3	4				2				5			3	1			6				3				46
	Milichiidae	*Milichiella lacteipennis*																	P				P																2
	Muscidae	*Limnophora helenae*	6		20		1		21		1		33		P				5		30		P		59		P				P		9		P		19		~210
	Phoridae	*Megaselia curtineura*			9												2																1						12
	Psychodidae	*Psuchoda surcoufi*																			1																		1
	Sarcophagidae	*Sarcophaga* sp.															2								1								1				1		5
	Scenopinidae	*Scenopinus glabrifrons*	5								1				1				1				3	2			2	1	1		1		1				1		20
	Sciaridae	Sciaridae indet.																					2																2
	Sphaeroceridae	Sphaeroceridae indet.	1																																				1
	Syrphidae	*Eumerus lugens*			1																1																		2
Siphonaptera	Ceratophyllidae	*Nosopsyllus londiniensis*			1																																		1
Hymenoptera	Apidae	*Apis mellifera*													P																								1
	Bethylidae	*Holepyris atlanticus*											1																										1
	Bethylidae	*Sclerodermus insularis*				1								6												2				1									10
	Braconidae	*Cotesia vestalis*	1						1																														2
	?Braconidae	?New flightless wasp		2	2			3		4		2	2			3									1				1										20
	Encyrtidae	*Rhopus* sp.																															1						1
	Formicidae	*Cardiocondyla emeryi*	1	3	6										7	7	7		10	5				2			1	1	~100							3	~40		~190
	Formicidae	*Hypoponera* sp.			24																																		24
	Formicidae	*Paratrechina longicornis*	2		~25			2		1			~25						14	1				5	6								~60				~20		~160
	Formicidae	*Pheidole megacephala*		2																																			2
	Formicidae	*Solenopsis globularia*		2	~100			3	~750			4	~250				~100		13	1			8	4	~200			1	~150				~150				~100		~1840
	Formicidae	*Tapinoma melanocephalum*					3	10	~300										1													4	7						~325
	Platygastridae	*Platygaster* sp.			1				1								1												1										4
	Sphecidae	*Podalonia canescens*					P								P																				P				3
No. taxa			47	24	37	10	36	17	26	10	25	16	21	13	23	17	17	10	39	15	16	12	28	16	21	9	28	18	18	16	40	16	27	8	22	8	19	11	124

APPENDIX F – TEMPORAL SURVEY RESULTS

Sample 1

Site			Stony Outwash				Stony Area				Central Plain East				Random 1				Total
Method			HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	
Reptilia	Gekkonidae	*Hemidactylus frenatus*	1				1				4				3				9
Mollusca	Helicidae	*Cornu aspersum*	1				1								1				3
	Succineidae	*Succinea sanctaehelenae*	2				1								4				7
Acari	Anystidae	*?Chaussieria benoiti*																	
	Anystidae	*?Chaussieria dissimilis*																	
	Bdellidae	*Bdellodes longirostris*		1			1	2										11	15
	Bdellidae	*?Bdellodes parvisetosa*					1												1
	Bdellidae	*?Bdellodes quadrisetosa*																	
	?Carabodidae	*?Carabodes* sp.																	
	Liodidae	*Liodes lanceosetosus*																	
	Scheloribatidae	*Scheloribates* sp.				300				25				25	1		100	200	651
Araneae	Corinnidae	*Xeropigo tridentiger*					1								1				2
	Dictynidae	*Archaeodictyna condocta*		1												2			3
	Linyphiidae	*Agyneta prosectes*																	
	Lycosidae	*Hogna nefasta*																	
	Lycosidae	*Lycosa elysae*																	
	Lycosidae	Lycosidae indet.																	
	Oecobiidae	Oecobiidae indet.					1	1							1				3
	Oonopidae	*Gamasomorpha insularis*																1	1
	Philodromidae	*Philodromus signatus*																	
	Salticidae	*Hasarius adansoni*					2				1				1				4
	Salticidae	*Pellenes inexcultus*									1								1
	Salticidae	Salticidae indet.						3	5				2			1			11
	Sicariidae	*Loxosceles rufescens*									2								2
	Theridiidae	*Latrodectus geometricus*	1			1					1				1				4
	Theridiidae	*Steatoda capensis*																	
	Thomisidae	*Bonapruncinia sanctaehelenae*																	
Isopoda	Platyarthridae	*Niambia capensis*			7	2			1				1				1		12
	Porcellionidae	*Porcellionides pruinosus*					1	9	2						2				14
Diplopoda	Julidae	*Ommatoiulus moreleti*					1								1		1		3
Chilopoda	Scolopendridae	*Cryptops hortensis*																	
	Scolopendridae	*Scolopendra morsitans*					1												1
	Scutigeridae	*Scutigera coleoptrata*																	
Collembola	Entomobryidae	*Entomobrya multifasciata*			150	2		2	200	7		1					50	2	414
	Poduridae	*Xenylla grisea*			150	1			400	250							10		811
Zygentoma	Lepismatidae	*Ctenolepisma sanctaehelenae*																	
	Lepismatidae	*Lepisma saccharina*				3				1	1								5

Blattodea	Blattidae	*Periplaneta australasiae*					1													1
	Corydiidae	*Euthyrrhapha pacifica*					1													1
Orthoptera	Acrididae	*Primnia sanctaehelenae*					1				1				1					3
	Gryllidae	*Gryllus bimaculatus*					1		1						1		3			6
	Mogoplistidae	*Cycloptiloides canariensis*			1				6								1			8
Dermaptera	Anisolabididae	*Euboriella annulipes*							5						2		23			30
	Labiduridae	*Labiduria riparia*																		
Psocoptera	Ectopsocidae	*Ectopsocus strauchi*													1					1
	Liposcelidae	*Liposcelis* sp.																		
	Myopsocidae	*Myopsocus eatoni*																		
	Peripsocidae	*Peripsocus stagnivagus*																		
	Trogiidae	*Cerobasis annulata / guestfalica*	5	17	25	4		1				5	1	7	8	1		1		75
	Trogiidae	*Helenatropos abrupta*																		
	Trogiidae	Trogiidae indet. (uniform grey)																		
		Psocidae indet. (brachypterous)																		
Thysanoptera	Phlaeothripidae	*Haplothrips gowdeyi*				4				4				2						10
Hemiptera	Anthocoridae	*Cardiastethus bicolor*		1		2														3
	Anthocoridae	*Cardiastethus exiguous*				2														2
	Anthocoridae	*Orius thripoborus*																		
	Cicadellidae	*Balclutha saltuella*		13	16	1	1				5	2			5	3		1		47
	Cydnidae	*Aethus pallidipennis*																		
	Lygaeidae	*Nysius ericae*	1	1	2			1			5	24			1					35
	Lygaeidae	*Nysius sanctaehelenae*	1																	1
	Miridae	*Creontiades pallidus*	1	2			4	9			3	2	2		1					24
	Miridae	*Hirtopsallus suedae*						1												1
	Nabidae	*Tropiconabis capsiformis*						1												1
Neuroptera	Chrysopidae	*Chrysoperla zastrowi*																		
Coleoptera	Anthicidae	*Anthicodes fragilis*			3	1														4
	Anthribidae	*Homeodera alutaceicollis*				1									1					2
	Anthribidae	*Homeodera longefasciata*																		
	Carabidae	*Calosoma chlorostictum*	1						1								6			8
	Carabidae	*Harpalus prosperus*			2								2				2			6
	Carabidae	*Harpalus sanctaehelenae*																		
	Carabidae	*Laemostenus complanatus*																		
	Coccinellidae	*Cheilomenes lunata*					1	2							1					4
	Coccinellidae	*Exochomus flavipes*																		
	Coccinellidae	*Scymnus nubilus*														1		15		16
	Curculionidae	*Acanthinomerus angustus*					3													3
	Curculionidae	*Acanthinomerus armatus*					1											1		2
	Curculionidae	*Isotornus proximus*					1													1
	Curculionidae	*Microxylobius westwoodi*	4			42		3		9	1			2						61
	Curculionidae	*Pericartius aequatorialis*																9		9
	Curculionidae	*Pseudostenoscelis compositarum*					5													5
	Ptinidae	*Xyletomerus insulanus*																		

	Scarabaeidae	*Mellissius* sp.																		
	Staphylinidae	Staphylinidae indet. (small)						1												1
	Tenebrionidae	*Gonocephalum simplex hadroides*							4											4
	Tenebrionidae	*Hemasodes batesi*									4									4
	Tenebrionidae	*Tarphiophasis leleupi*									2									2
Lepidoptera	Crambidae	*Spoladea recurvalis*	1		1										1					3
	Erebidae	*Ophiusa tirhaca*																		
	Pterophoridae	*Agdistis sanctaehelenae*																		
	Tineidae	*Opogona* sp.		3	7	2	1	1			1	1	21	1	1	2	12			53
	Tineidae	*Opogona* sp. nov. (large)																		
Diptera	Agromyzidae	?*Phytomyza atricornis*																		
	Asteiidae	*Anarista vittata*						8												8
	Calliphoridae	*Calliphora croceipennis*			1															1
	Calliphoridae	*Lucilia sericata*															1			1
	Chloropidae	*Elachiptera sacculicornis*													1					1
	Chryomyidae	*Gymnochiromyia flavella*															1			1
	Drosopilidae	*Drosophila repleta*																		
	Drosopilidae	*Drosophila simulans*									12				1	1	3			17
	Drosopilidae	*Scaptomyza pallida*																		
	Drosopilidae	*Zaprionus tuberculatus*																		
	Ephydridae	*Scatella septemfenestrata*													1					1
	Ephydridae	*Psilopa* sp.		5				3								2				10
	Fanniidae	*Euryomma peregrinum*																		
	Fanniidae	*Fannia canicularis*																		
	Muscidae	*Limnophora helenae*	1		47		1		32				22		1		11			115
	Phoridae	Phoridae indet.																		
	Psychodidae	*Psuchoda surcoufi*																		
	Sarcophagidae	*Sarcophaga redux*															1			1
	Scenopinidae	*Scenopinus glabrifrons*									1				1					2
	Sciaridae	Sciaridae indet.													1					1
	Sphaeroceridae	Sphaeroceridae indet.			1												2			3
	Syrphidae	*Eumerus lugens*																		
Siphonaptera	Pulicidae	*Xenopsylla brasiliensis*																		
Hymenoptera	Apidae	*Apis mellifera*													1					1
	Bethylidae	*Sclerodermus insularis*																		
	Braconidae	*Aphidius colemani*									1									1
	Braconidae	*Cotesia vestalis*							1											1
	?Braconidae	?New flightless wasp			2	2										1	1			6
	Encyrtidae	*Rhopus* sp.																		
	Formicidae	*Cardiocondyla emeryi*			25			3	100			3	50				50			231
	Formicidae	*Nylanderia bourbonica*																		
	Formicidae	*Paratrechina longicornis*	1									11	40		1		10			63
	Formicidae	*Pheidole meegacephala*													3					3
	Formicidae	*Solenopsis globularia*		2	300	1					13	1					50			367

	Formicidae	*Tapinoma melanocephalum*					2	3											5
	Platygastridae	*Platygaster* sp.												1					1
	Sphecidae	*Podalonia canescens*																	
No. taxa			13	10	17	17	25	18	13	6	18	9	9	6	31	9	21	9	80

Sample 2

Site			Stony Outwash				Stony Area				Central Plain East				Random 2				Total
Method			HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	
Reptilia	Gekkonidae	*Hemidactylus frenatus*	1				1				1				1				4
Mollusca	Helicidae	*Cornu aspersum*	1				1												2
	Succineidae	*Succinea sanctaehelenae*	1				1												2
Acari	Anystidae	*?Chaussieria benoiti*																	
	Anystidae	*?Chaussieria dissimilis*																	
	Bdellidae	*Bdellodes longirostris*		1		1		2											4
	Bdellidae	*?Bdellodes parvisetosa*																	
	Bdellidae	*?Bdellodes quadrisetosa*			2				1										3
	?Carabodidae	*?Carabodes* sp.																	
	Liodidae	*Liodes lanceosetosus*				1													1
	Scheloribatidae	*Scheloribates* sp.								400				3					403
Araneae	Corinnidae	*Xeropigo tridentiger*					1								1				2
	Dictynidae	*Archaeodictyna condocta*		1															1
	Linyphiidae	*Agyneta prosectes*		1	1														2
	Lycosidae	*Hogna nefasta*																	
	Lycosidae	*Lycosa elysae*																	
	Lycosidae	Lycosidae indet.																	
	Oecobiidae	Oecobiidae indet.							2										2
	Oonopidae	*Gamasomorpha insularis*																	
	Philodromidae	*Philodromus signatus*																	
	Salticidae	*Hasarius adansoni*						1								2			3
	Salticidae	*Pellenes inexcultus*					1								1				2
	Salticidae	Salticidae indet.							4		1		3						8
	Sicariidae	*Loxosceles rufescens*									2								2
	Theridiidae	*Latrodectus geometricus*	1				1								1				3
	Theridiidae	*Steatoda capensis*																	
	Thomisidae	*Bonapruncinia sanctaehelenae*				1													1
Isopoda	Platyarthridae	*Niambia capensis*			2				2				2				2		8
	Porcellionidae	*Porcellionides pruinosus*			7		1	3	4										15
Diplopoda	Julidae	*Ommatoiulus moreleti*					1												1
Chilopoda	Scolopendridae	*Cryptops hortensis*																	
	Scolopendridae	*Scolopendra morsitans*					1												1
	Scutigeridae	*Scutigera coleoptrata*																	
Collembola	Entomobryidae	*Entomobrya multifasciata*		5	50				50			1	1				6	1	114

	Poduridae	*Xenylla grisea*							1										1
Zygentoma	Lepismatidae	*Ctenolepisma sanctaehelenae*																	
	Lepismatidae	*Lepisma saccharina*											2	1					3
Blattodea	Blattidae	*Periplaneta australasiae*																	
	Corydiidae	*Euthyrrhapha pacifica*					1												1
Orthoptera	Acrididae	*Primnia sanctaehelenae*	1				1				1				1				4
	Gryllidae	*Gryllus bimaculatus*					1						1						2
	Mogoplistidae	*Cycloptiloides canariensis*							3										3
Dermaptera	Anisolabididae	*Euboriella annulipes*							9										9
	Labiduridae	*Labiduria riparia*											1						1
Psocoptera	Ectopsocidae	*Ectopsocus strauchi*													1				1
	Liposcelidae	*Liposcelis* sp.																	
	Myopsocidae	*Myopsocus eatoni*															1		1
	Peripsocidae	*Peripsocus stagnivagus*				3													3
	Trogiidae	*Cerobasis annulata / guestfalica*	3	8	2	2		1				7		2	7	1	1		34
	Trogiidae	*Helenatropos abrupta*																	
	Trogiidae	Trogiidae indet. (uniform grey)																	
		Psocidae indet. (brachypterous)																	
Thysanoptera	Phlaeothripidae	*Haplothrips gowdeyi*	1		3	2			2	2							1	1	12
Hemiptera	Anthocoridae	*Cardiastethus bicolor*						1		2									3
	Anthocoridae	*Cardiastethus exiguous*											1	1					2
	Anthocoridae	*Orius thripoborus*	1																1
	Cicadellidae	*Balclutha saltuella*		2	54						1	1	1	1			2		62
	Cydnidae	*Aethus pallidipennis*																	
	Lygaeidae	*Nysius ericae*	1					1	1		1	5			2				11
	Lygaeidae	*Nysius sanctaehelenae*	1																1
	Miridae	*Creontiades pallidus*	1	1			4	4				2			1				13
	Miridae	*Hirtopsallus suedae*																	
	Nabidae	*Tropiconabis capsiformis*			1														1
Neuroptera	Chrysopidae	*Chrysoperla zastrowi*																	
Coleoptera	Anthicidae	*Anthicodes fragilis*			2	6								1					9
	Anthribidae	*Homeodera alutaceicollis*		1		1	1			1		1			3				8
	Anthribidae	*Homeodera longefasciata*				7													7
	Carabidae	*Calosoma chlorostictum*	1		1		1		3										6
	Carabidae	*Harpalus prosperus*																	
	Carabidae	*Harpalus sanctaehelenae*																	
	Carabidae	*Laemostenus complanatus*																	
	Coccinellidae	*Cheilomenes lunata*			4														4
	Coccinellidae	*Exochomus flavipes*																	
	Coccinellidae	*Scymnus nubilus*														1			1
	Curculionidae	*Acanthinomerus angustus*																	
	Curculionidae	*Acanthinomerus armatus*				1				3									4
	Curculionidae	*Isotornus proximus*				10	1												11
	Curculionidae	*Microxylobius westwoodi*	4	1		13		5	1	95	1	1		56				4	181

	Curculionidae	*Pericartius aequatorialis*				1				8									9
	Curculionidae	*Pseudostenoscelis compositarum*					5												5
	Ptinidae	*Xyletomerus insulanus*																	
	Scarabaeidae	*Mellissius* sp.	1				1												2
	Staphylinidae	Staphylinidae indet. (small)															1		1
	Tenebrionidae	*Gonocephalum simplex hadroides*			1				3								4		8
	Tenebrionidae	*Hemasodes batesi*									4								4
	Tenebrionidae	*Tarphiophasis leleupi*									2								2
Lepidoptera	Crambidae	*Spoladea recurvalis*	1				1				1								3
	Erebidae	*Ophiusa tirhaca*			1														1
	Pterophoridae	*Agdistis sanctaehelenae*																	
	Tineidae	*Opogona* sp.	1	2	28		1	1	4		1	1	15	1	1	1	29		86
	Tineidae	*Opogona* sp. nov. (large)																	
Diptera	Agromyzidae	?*Phytomyza atricornis*											1						1
	Asteiidae	*Anarista vittata*																	
	Calliphoridae	*Calliphora croceipennis*																	
	Calliphoridae	*Lucilia sericata*																	
	Chloropidae	*Elachiptera sacculicornis*																	
	Chryomyidae	*Gymnochiromyia flavella*																	
	Drosopilidae	*Drosophila repleta*			3				8										11
	Drosopilidae	*Drosophila simulans*			9				19		12		1			1	37		79
	Drosopilidae	*Scaptomyza pallida*			18				1				1				1		21
	Drosopilidae	*Zaprionus tuberculatus*															4		4
	Ephydridae	*Scatella septemfenestrata*																	
	Ephydridae	*Psilopa* sp.		3	3			1							1	2			10
	Fanniidae	*Euryomma peregrinum*			5				8								1		14
	Fanniidae	*Fannia canicularis*															1		1
	Muscidae	*Limnophora helenae*	1		23		1		19		1		9		1		22		77
	Phoridae	Phoridae indet.							1										1
	Psychodidae	*Psuchoda surcoufi*												1					1
	Sarcophagidae	*Sarcophaga redux*			1												2		3
	Scenopinidae	*Scenopinus glabrifrons*									1								1
	Sciaridae	Sciaridae indet.							1										1
	Sphaeroceridae	Sphaeroceridae indet.																	
	Syrphidae	*Eumerus lugens*																	
Siphonaptera	Pulicidae	*Xenopsylla brasiliensis*																	
Hymenoptera	Apidae	*Apis mellifera*																	
	Bethylidae	*Sclerodermus insularis*				1				2									3
	Braconidae	*Aphidius colemani*																	
	Braconidae	*Cotesia vestalis*																	
	?Braconidae	?New flightless wasp			3					1									4
	Encyrtidae	*Rhopus* sp.																	
	Formicidae	*Cardiocondyla emeryi*						3				2			1	2			8
	Formicidae	*Nylanderia bourbonica*																	

	Formicidae	*Paratrechina longicornis*	1									4	150				100		255
	Formicidae	*Pheidole meegacephala*																	
	Formicidae	*Solenopsis globularia*		2	500				250		3	1	101		2		301		1160
	Formicidae	*Tapinoma melanocephalum*					2	3	4										9
	Platygastridae	*Platygaster* sp.																	
	Sphecidae	*Podalonia canescens*																	
No. taxa			18	12	24	14	22	12	24	9	15	11	15	9	15	7	18	3	82

Sample 3

Site			Stony Outwash				Stony Area				Central Plain East				Random 3				Total
Method			HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	
Reptilia	Gekkonidae	*Hemidactylus frenatus*	1				1				1								3
Mollusca	Helicidae	*Cornu aspersum*	1				1												2
	Succineidae	*Succinea sanctaehelenae*	1				1												2
Acari	Anystidae	*?Chaussieria benoiti*			1														1
	Anystidae	*?Chaussieria dissimilis*																	
	Bdellidae	*Bdellodes longirostris*																	
	Bdellidae	*?Bdellodes parvisetosa*																	
	Bdellidae	*?Bdellodes quadrisetosa*																	
	?Carabodidae	*?Carabodes* sp.								3									3
	Liodidae	*Liodes lanceosetosus*																	
	Scheloribatidae	*Scheloribates* sp.				60													60
Araneae	Corinnidae	*Xeropigo tridentiger*					1												1
	Dictynidae	*Archaeodictyna condocta*		1														2	3
	Linyphiidae	*Agyneta prosectes*						2											2
	Lycosidae	*Hogna nefasta*																	
	Lycosidae	*Lycosa elysae*															2		2
	Lycosidae	Lycosidae indet.																	
	Oecobiidae	Oecobiidae indet.			1		1	1	2										5
	Oonopidae	*Gamasomorpha insularis*							1										1
	Philodromidae	*Philodromus signatus*				1													1
	Salticidae	*Hasarius adansoni*			1											1			2
	Salticidae	*Pellenes inexcultus*							1										1
	Salticidae	Salticidae indet.	1		4						1		2				5		13
	Sicariidae	*Loxosceles rufescens*							1										1
	Theridiidae	*Latrodectus geometricus*	1								1				1				3
	Theridiidae	*Steatoda capensis*																	
	Thomisidae	*Bonapruncinia sanctaehelenae*																	
Isopoda	Platyarthridae	*Niambia capensis*																	
	Porcellionidae	*Porcellionides pruinosus*			1		1	1	21										24
Diplopoda	Julidae	*Ommatoiulus moreleti*					1												1
Chilopoda	Scolopendridae	*Cryptops hortensis*																	

	Scolopendridae	*Scolopendra morsitans*					1												1
	Scutigeridae	*Scutigera coleoptrata*																	
Collembola	Entomobryidae	*Entomobrya multifasciata*			8			2				1							11
	Poduridae	*Xenylla grisea*																	
Zygentoma	Lepismatidae	*Ctenolepisma sanctaehelenae*												1					1
	Lepismatidae	*Lepisma saccharina*									1		1						2
Blattodea	Blattidae	*Periplaneta australasiae*					1												1
	Corydiidae	*Euthyrrhapha pacifica*					1												1
Orthoptera	Acrididae	*Primnia sanctaehelenae*					1				1								2
	Gryllidae	*Gryllus bimaculatus*			3		1		4						1				9
	Mogoplistidae	*Cycloptiloides canariensis*																	
Dermaptera	Anisolabididae	*Euboriella annulipes*							8										8
	Labiduridae	*Labiduria riparia*																	
Psocoptera	Ectopsocidae	*Ectopsocus strauchi*				1		2				1						4	8
	Liposcelidae	*Liposcelis* sp.												1					1
	Myopsocidae	*Myopsocus eatoni*			1														1
	Peripsocidae	*Peripsocus stagnivagus*																	
	Trogiidae	*Cerobasis annulata / guestfalica*	5	9	1			1				2	1	4		1			24
	Trogiidae	*Helenatropos abrupta*																	
	Trogiidae	Trogiidae indet. (uniform grey)				1													1
		Psocidae indet. (brachypterous)								1									1
Thysanoptera	Phlaeothripidae	*Haplothrips gowdeyi*				5		2		1								4	12
Hemiptera	Anthocoridae	*Cardiastethus bicolor*		1															1
	Anthocoridae	*Cardiastethus exiguous*																	
	Anthocoridae	*Orius thripoborus*																	
	Cicadellidae	*Balclutha saltuella*					1				5								6
	Cydnidae	*Aethus pallidipennis*																	
	Lygaeidae	*Nysius ericae*	1	1				2			5	1	1						11
	Lygaeidae	*Nysius sanctaehelenae*	1																1
	Miridae	*Creontiades pallidus*	1	2			4	9	1		3	3							23
	Miridae	*Hirtopsallus suedae*						1											1
	Nabidae	*Tropiconabis capsiformis*						1											1
Neuroptera	Chrysopidae	*Chrysoperla zastrowi*																	
Coleoptera	Anthicidae	*Anthicodes fragilis*											1				1	2	4
	Anthribidae	*Homeodera alutaceicollis*										1						15	16
	Anthribidae	*Homeodera longefasciata*															1	8	9
	Carabidae	*Calosoma chlorostictum*	1																1
	Carabidae	*Harpalus prosperus*																	
	Carabidae	*Harpalus sanctaehelenae*																	
	Carabidae	*Laemostenus complanatus*			1														1
	Coccinellidae	*Cheilomenes lunata*					1												1
	Coccinellidae	*Exochomus flavipes*																	
	Coccinellidae	*Scymnus nubilus*						1								1			2
	Curculionidae	*Acanthinomerus angustus*					3												3

	Curculionidae	*Acanthinomerus armatus*					1			4								31	36
	Curculionidae	*Isotornus proximus*					1			1								3	5
	Curculionidae	*Microxylobius westwoodi*	4	1		1		3		10	1	1	3	156					180
	Curculionidae	*Pericartius aequatorialis*																1	1
	Curculionidae	*Pseudostenoscelis compositarum*					5												5
	Ptinidae	*Xyletomerus insulanus*																1	1
	Scarabaeidae	*Mellissius* sp.																	
	Staphylinidae	Staphylinidae indet. (small)																	
	Tenebrionidae	*Gonocephalum simplex hadroides*																	
	Tenebrionidae	*Hemasodes batesi*									4								4
	Tenebrionidae	*Tarphiophasis leleupi*									2								2
Lepidoptera	Crambidae	*Spoladea recurvalis*	1																1
	Erebidae	*Ophiusa tirhaca*																	
	Pterophoridae	*Agdistis sanctaehelenae*																	
	Tineidae	*Opogona* sp.		1	3	6	1		5	1	1	1	8		1	2	4		34
	Tineidae	*Opogona* sp. nov. (large)																	
Diptera	Agromyzidae	?*Phytomyza atricornis*																	
	Asteiidae	*Anarista vittata*						8											8
	Calliphoridae	*Calliphora croceipennis*																	
	Calliphoridae	*Lucilia sericata*																	
	Chloropidae	*Elachiptera sacculicornis*																	
	Chryomyidae	*Gymnochiromyia flavella*																	
	Drosopilidae	*Drosophila repleta*																	
	Drosopilidae	*Drosophila simulans*									12								12
	Drosopilidae	*Scaptomyza pallida*																	
	Drosopilidae	*Zaprionus tuberculatus*																	
	Ephydridae	*Scatella septemfenestrata*																	
	Ephydridae	*Psilopa* sp.		1				1											2
	Fanniidae	*Euryomma peregrinum*																	
	Fanniidae	*Fannia canicularis*																	
	Muscidae	*Limnophora helenae*	1		18		1		4						1		6		31
	Phoridae	Phoridae indet.																	
	Psychodidae	*Psuchoda surcoufi*																	
	Sarcophagidae	*Sarcophaga redux*																	
	Scenopinidae	*Scenopinus glabrifrons*									1								1
	Sciaridae	Sciaridae indet.																	
	Sphaeroceridae	Sphaeroceridae indet.																	
	Syrphidae	*Eumerus lugens*																	
Siphonaptera	Pulicidae	*Xenopsylla brasiliensis*							1										1
Hymenoptera	Apidae	*Apis mellifera*																	
	Bethylidae	*Sclerodermus insularis*								1								15	16
	Braconidae	*Aphidius colemani*									1								1
	Braconidae	*Cotesia vestalis*																	
	?Braconidae	?New flightless wasp								1									1

	Encyrtidae	*Rhopus* sp.																	
	Formicidae	*Cardiocondyla emeryi*						3				3	1						7
	Formicidae	*Nylanderia bourbonica*																	
	Formicidae	*Paratrechina longicornis*	1										17						18
	Formicidae	*Pheidole meegacephala*																	
	Formicidae	*Solenopsis globularia*		2	201						13	1	100				50		367
	Formicidae	*Tapinoma melanocephalum*			50		2	3											55
	Platygastridae	*Platygaster* sp.																	
	Sphecidae	*Podalonia canescens*																	
No. taxa			14	9	14	7	22	17	11	9	16	10	10	4	4	4	7	11	74

Sample 4

Site			Stony Outwash				Stony Area				Central Plain East				Random 4				Total
Method			HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	
Reptilia	Gekkonidae	*Hemidactylus frenatus*	1				1				1				1				4
Mollusca	Helicidae	*Cornu aspersum*	1				1												2
	Succineidae	*Succinea sanctaehelenae*	1				1												2
Acari	Anystidae	*?Chaussieria benoiti*																	
	Anystidae	*?Chaussieria dissimilis*																	
	Bdellidae	*Bdellodes longirostris*																	
	Bdellidae	*?Bdellodes parvisetosa*																	
	Bdellidae	*?Bdellodes quadrisetosa*																	
	?Carabodidae	*?Carabodes* sp.																	
	Liodidae	*Liodes lanceosetosus*																	
	Scheloribatidae	*Scheloribates* sp.			2	400									5	30		350	787
Araneae	Corinnidae	*Xeropigo tridentiger*	1				1		1		1								4
	Dictynidae	*Archaeodictyna condocta*			2		1												3
	Linyphiidae	*Agyneta prosectes*		6															6
	Lycosidae	*Hogna nefasta*																	
	Lycosidae	*Lycosa elysae*																	
	Lycosidae	Lycosidae indet.																	
	Oecobiidae	Oecobiidae indet.											1			1	1		3
	Oonopidae	*Gamasomorpha insularis*																	
	Philodromidae	*Philodromus signatus*		1	2	1			1							1			6
	Salticidae	*Hasarius adansoni*														1			1
	Salticidae	*Pellenes inexcultus*																	
	Salticidae	Salticidae indet.			1		1		1		1		4		1		3		12
	Sicariidae	*Loxosceles rufescens*											2						2
	Theridiidae	*Latrodectus geometricus*	1			1						1			1				4
	Theridiidae	*Steatoda capensis*																	
	Thomisidae	*Bonapruncinia sanctaehelenae*																	
Isopoda	Platyarthridae	*Niambia capensis*																	

	Porcellionidae	*Porcellionides pruinosus*	1		6		1		13						1					22
Diplopoda	Julidae	*Ommatoiulus moreleti*					1		2						1					4
Chilopoda	Scolopendridae	*Cryptops hortensis*			1															1
	Scolopendridae	*Scolopendra morsitans*					3													3
	Scutigeridae	*Scutigera coleoptrata*																		
Collembola	Entomobryidae	*Entomobrya multifasciata*		2												1	15			18
	Poduridae	*Xenylla grisea*																		
Zygentoma	Lepismatidae	*Ctenolepisma sanctaehelenae*												6						6
	Lepismatidae	*Lepisma saccharina*				2	1		1				2							6
Blattodea	Blattidae	*Periplaneta australasiae*					1								1					2
	Corydiidae	*Euthyrrhapha pacifica*	1																	1
Orthoptera	Acrididae	*Primnia sanctaehelenae*	1				1				1									3
	Gryllidae	*Gryllus bimaculatus*	1		1		1		1						1		1			6
	Mogoplistidae	*Cycloptiloides canariensis*																		
Dermaptera	Anisolabididae	*Euboriella annulipes*					1		9											10
	Labiduridae	*Labiduria riparia*	1																	1
Psocoptera	Ectopsocidae	*Ectopsocus strauchi*															1			1
	Liposcelidae	*Liposcelis* sp.								1				3		1		1		6
	Myopsocidae	*Myopsocus eatoni*															2			2
	Peripsocidae	*Peripsocus stagnivagus*															2			2
	Trogiidae	*Cerobasis annulata / guestfalica*		7	1		10			2		1		10	3	13	4	19		70
	Trogiidae	*Helenatropos abrupta*																		
	Trogiidae	Trogiidae indet. (uniform grey)																		
		Psocidae indet. (brachypterous)															1			1
Thysanoptera	Phlaeothripidae	*Haplothrips gowdeyi*			1	5	5	1	3	4			1	8		7	6	1		42
Hemiptera	Anthocoridae	*Cardiastethus bicolor*		2												1				3
	Anthocoridae	*Cardiastethus exiguous*																		
	Anthocoridae	*Orius thripoborus*					4								1					5
	Cicadellidae	*Balclutha saltuella*																		
	Cydnidae	*Aethus pallidipennis*																		
	Lygaeidae	*Nysius ericae*					1	6	4						3		2			16
	Lygaeidae	*Nysius sanctaehelenae*																		
	Miridae	*Creontiades pallidus*					5	2	1	2		2			3	2				17
	Miridae	*Hirtopsallus suedae*					2													2
	Nabidae	*Tropiconabis capsiformis*																		
Neuroptera	Chrysopidae	*Chrysoperla zastrowi*																		
Coleoptera	Anthicidae	*Anthicodes fragilis*			3		2													5
	Anthribidae	*Homeodera alutaceicollis*		1			4			1					4	1		21		32
	Anthribidae	*Homeodera longefasciata*					1			2										3
	Carabidae	*Calosoma chlorostictum*	1				1								1					3
	Carabidae	*Harpalus prosperus*			6															6
	Carabidae	*Harpalus sanctaehelenae*																		
	Carabidae	*Laemostenus complanatus*																		
	Coccinellidae	*Cheilomenes lunata*																		

	Coccinellidae	*Exochomus flavipes*						1							1				2
	Coccinellidae	*Scymnus nubilus*														1			1
	Curculionidae	*Acanthinomerus angustus*																	
	Curculionidae	*Acanthinomerus armatus*						1		21									22
	Curculionidae	*Isotornus proximus*					1	3		9									13
	Curculionidae	*Microxylobius westwoodi*				10	6			93		1	1	108		2		1	222
	Curculionidae	*Pericartius aequatorialis*																7	7
	Curculionidae	*Pseudostenoscelis compositarum*																	
	Ptinidae	*Xyletomerus insulanus*																	
	Scarabaeidae	*Mellissius* sp.	1				1								1				3
	Staphylinidae	Staphylinidae indet. (small)				1													1
	Tenebrionidae	*Gonocephalum simplex hadroides*					1												1
	Tenebrionidae	*Hemasodes batesi*																	
	Tenebrionidae	*Tarphiophasis leleupi*																	
Lepidoptera	Crambidae	*Spoladea recurvalis*																	
	Erebidae	*Ophiusa tirhaca*							2										2
	Pterophoridae	*Agdistis sanctaehelenae*							1										1
	Tineidae	*Opogona* sp.	1		1	1	1	1			1		1		1	1	2		11
	Tineidae	*Opogona* sp. nov. (large)														1			1
Diptera	Agromyzidae	?*Phytomyza atricornis*																	
	Asteiidae	*Anarista vittata*					1												1
	Calliphoridae	*Calliphora croceipennis*																	
	Calliphoridae	*Lucilia sericata*																	
	Chloropidae	*Elachiptera sacculicornis*																	
	Chryomyidae	*Gymnochiromyia flavella*																	
	Drosopilidae	*Drosophila repleta*																	
	Drosopilidae	*Drosophila simulans*																	
	Drosopilidae	*Scaptomyza pallida*																	
	Drosopilidae	*Zaprionus tuberculatus*																	
	Ephydridae	*Scatella septemfenestrata*																	
	Ephydridae	*Psilopa* sp.		2			1	1											4
	Fanniidae	*Euryomma peregrinum*																	
	Fanniidae	*Fannia canicularis*																	
	Muscidae	*Limnophora helenae*	1		16		1		2		1		1		1		14		37
	Phoridae	Phoridae indet.			1														1
	Psychodidae	*Psuchoda surcoufi*																	
	Sarcophagidae	*Sarcophaga redux*			1														1
	Scenopinidae	*Scenopinus glabrifrons*														1	2		3
	Sciaridae	Sciaridae indet.			1														1
	Sphaeroceridae	Sphaeroceridae indet.																	
	Syrphidae	*Eumerus lugens*																	
Siphonaptera	Pulicidae	*Xenopsylla brasiliensis*																	
Hymenoptera	Apidae	*Apis mellifera*																	
	Bethylidae	*Sclerodermus insularis*				3				20									23

	Braconidae	*Aphidius colemani*																	
	Braconidae	*Cotesia vestalis*																	
	?Braconidae	?New flightless wasp		1	1														2
	Encyrtidae	*Rhopus* sp.															2		2
	Formicidae	*Cardiocondyla emeryi*										8		1					9
	Formicidae	*Nylanderia bourbonica*														1			1
	Formicidae	*Paratrechina longicornis*							1				6				101		108
	Formicidae	*Pheidole meegacephala*																	
	Formicidae	*Solenopsis globularia*		1	150				100			1	251				100		603
	Formicidae	*Tapinoma melanocephalum*			250			1	50										301
	Platygastridae	*Platygaster* sp.							2								1		3
	Sphecidae	*Podalonia canescens*					1												1
No. taxa			14	9	19	9	33	9	18	10	6	6	10	6	18	17	18	7	73

Sample 5

Site			Stony Outwash				Stony Area				Central Plain East				Random 5				Total
Method			HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	HS	BV	PF	BE	
Reptilia	Gekkonidae	*Hemidactylus frenatus*	1				1				1				1				4
Mollusca	Helicidae	*Cornu aspersum*	1				1								1				3
	Succineidae	*Succinea sanctaehelenae*	1																1
Acari	Anystidae	*?Chaussieria benoiti*																	
	Anystidae	*?Chaussieria dissimilis*			1														1
	Bdellidae	*Bdellodes longirostris*																	
	Bdellidae	*?Bdellodes parvisetosa*																	
	Bdellidae	*?Bdellodes quadrisetosa*																	
	?Carabodidae	*?Carabodes* sp.																	
	Liodidae	*Liodes lanceosetosus*				20													20
	Scheloribatidae	*Scheloribates* sp.			3	150								1					154
Araneae	Corinnidae	*Xeropigo tridentiger*	1				1								1				3
	Dictynidae	*Archaeodictyna condocta*																	
	Linyphiidae	*Agyneta prosectes*		2															2
	Lycosidae	*Hogna nefasta*											1						1
	Lycosidae	*Lycosa elysae*																	
	Lycosidae	Lycosidae indet.	1				1				1								3
	Oecobiidae	Oecobiidae indet.			2				4			2		1			4		13
	Oonopidae	*Gamasomorpha insularis*																	
	Philodromidae	*Philodromus signatus*				2												1	3
	Salticidae	*Hasarius adansoni*						4	4				1				2		11
	Salticidae	*Pellenes inexcultus*					1		1		1				1				4
	Salticidae	Salticidae indet.			1				3				1						5
	Sicariidae	*Loxosceles rufescens*													1				1
	Theridiidae	*Latrodectus geometricus*	1		1						1				1				4

	Theridiidae	*Steatoda capensis*									1				1				2
	Thomisidae	*Bonapruncinia sanctaehelenae*								1									1
Isopoda	Platyarthridae	*Niambia capensis*							1		2								3
	Porcellionidae	*Porcellionides pruinosus*							1										1
Diplopoda	Julidae	*Ommatoiulus moreleti*					1		1										2
Chilopoda	Scolopendridae	*Cryptops hortensis*							1										1
	Scolopendridae	*Scolopendra morsitans*					1								1				2
	Scutigeridae	*Scutigera coleoptrata*									3		1						4
Collembola	Entomobryidae	*Entomobrya multifasciata*	1																1
	Poduridae	*Xenylla grisea*																	
Zygentoma	Lepismatidae	*Ctenolepisma sanctaehelenae*				2													2
	Lepismatidae	*Lepisma saccharina*							2						1		3		6
Blattodea	Blattidae	*Periplaneta australasiae*					1		1										2
	Corydiidae	*Euthyrrhapha pacifica*													1				1
Orthoptera	Acrididae	*Primnia sanctaehelenae*									1				1		1		3
	Gryllidae	*Gryllus bimaculatus*	1				1		2						1				5
	Mogoplistidae	*Cycloptiloides canariensis*																	
Dermaptera	Anisolabididae	*Euboriella annulipes*					1												1
	Labiduridae	*Labiduria riparia*							20										20
Psocoptera	Ectopsocidae	*Ectopsocus strauchi*							1										1
	Liposcelidae	*Liposcelis* sp.																	
	Myopsocidae	*Myopsocus eatoni*															1	3	4
	Peripsocidae	*Peripsocus stagnivagus*																	
	Trogiidae	*Cerobasis annulata / guestfalica*	4	3	1								1				1		10
	Trogiidae	*Helenatropos abrupta*								1									1
	Trogiidae	Trogiidae indet. (uniform grey)																	
		Psocidae indet. (brachypterous)																	
Thysanoptera	Phlaeothripidae	*Haplothrips gowdeyi*				4								7				1	12
Hemiptera	Anthocoridae	*Cardiastethus bicolor*																	
	Anthocoridae	*Cardiastethus exiguous*																	
	Anthocoridae	*Orius thripoborus*																	
	Cicadellidae	*Balclutha saltuella*																	
	Cydnidae	*Aethus pallidipennis*										1			1	2	1		5
	Lygaeidae	*Nysius ericae*	9	8							4		1						22
	Lygaeidae	*Nysius sanctaehelenae*																	
	Miridae	*Creontiades pallidus*	1	1				1	1										4
	Miridae	*Hirtopsallus suedae*						1							2				3
	Nabidae	*Tropiconabis capsiformis*																	
Neuroptera	Chrysopidae	*Chrysoperla zastrowi*	1																1
Coleoptera	Anthicidae	*Anthicodes fragilis*											1				1		2
	Anthribidae	*Homeodera alutaceicollis*	2																2
	Anthribidae	*Homeodera longefasciata*				1												2	3
	Carabidae	*Calosoma chlorostictum*					1								1				2
	Carabidae	*Harpalus prosperus*																	

	Carabidae	*Harpalus sanctaehelenae*																		
	Carabidae	*Laemostenus complanatus*																		
	Coccinellidae	*Cheilomenes lunata*																		
	Coccinellidae	*Exochomus flavipes*	1																	1
	Coccinellidae	*Scymnus nubilus*	1																	1
	Curculionidae	*Acanthinomerus angustus*																		
	Curculionidae	*Acanthinomerus armatus*		1	1	1				20									4	27
	Curculionidae	*Isotornus proximus*						1		10					1					12
	Curculionidae	*Microxylobius westwoodi*	5			7				1	2	2	1	7	5				2	25
	Curculionidae	*Pericartius aequatorialis*				2				2									1	5
	Curculionidae	*Pseudostenoscelis compositarum*																		
	Ptinidae	*Xyletomerus insulanus*																		
	Scarabaeidae	*Mellissius* sp.	1				1								1					3
	Staphylinidae	Staphylinidae indet. (small)																		
	Tenebrionidae	*Gonocephalum simplex hadroides*	2		1		1		1				3		1		3			10
	Tenebrionidae	*Hemasodes batesi*																		
	Tenebrionidae	*Tarphiophasis leleupi*					2				4				1					7
Lepidoptera	Crambidae	*Spoladea recurvalis*																		
	Erebidae	*Ophiusa tirhaca*			1				1											2
	Pterophoridae	*Agdistis sanctaehelenae*																		
	Tineidae	*Opogona* sp.	1		11	1			2		1		6				8			30
	Tineidae	*Opogona* sp. nov. (large)																		
Diptera	Agromyzidae	?*Phytomyza atricornis*																		
	Asteiidae	*Anarista vittata*						1												1
	Calliphoridae	*Calliphora croceipennis*																		
	Calliphoridae	*Lucilia sericata*																		
	Chloropidae	*Elachiptera sacculicornis*																		
	Chryomyidae	*Gymnochiromyia flavella*																		
	Drosopilidae	*Drosophila repleta*																		
	Drosopilidae	*Drosophila simulans*															4			4
	Drosopilidae	*Scaptomyza pallida*																		
	Drosopilidae	*Zaprionus tuberculatus*																		
	Ephydridae	*Scatella septemfenestrata*																		
	Ephydridae	*Psilopa* sp.	2	7	7			2									1			19
	Fanniidae	*Euryomma peregrinum*																		
	Fanniidae	*Fannia canicularis*																		
	Muscidae	*Limnophora helenae*			3				2						1		1			7
	Phoridae	Phoridae indet.							1											1
	Psychodidae	*Psuchoda surcoufi*																		
	Sarcophagidae	*Sarcophaga redux*															1			1
	Scenopinidae	*Scenopinus glabrifrons*																		
	Sciaridae	Sciaridae indet.								1										1
	Sphaeroceridae	Sphaeroceridae indet.																		
	Syrphidae	*Eumerus lugens*			1															1

Siphonaptera	Pulicidae	*Xenopsylla brasiliensis*																	
Hymenoptera	Apidae	*Apis mellifera*																	
	Bethylidae	*Sclerodermus insularis*				1												4	5
	Braconidae	*Aphidius colemani*																	
	Braconidae	*Cotesia vestalis*																	
	?Braconidae	?New flightless wasp																	
	Encyrtidae	*Rhopus* sp.																	
	Formicidae	*Cardiocondyla emeryi*																	
	Formicidae	*Nylanderia bourbonica*																	
	Formicidae	*Paratrechina longicornis*	1	2	1				1		7		51			1	1001		1065
	Formicidae	*Pheidole meegacephala*																	
	Formicidae	*Solenopsis globularia*	3	14	102		2	2	150		1	11	101			1	201		588
	Formicidae	*Tapinoma melanocephalum*		6	1000		1	2	20										1029
	Platygastridae	*Platygaster* sp.																	
	Sphecidae	*Podalonia canescens*																	
No. taxa			22	9	16	11	16	8	22	7	14	4	12	4	21	3	16	8	71

APPENDIX G – MALAISE TRAP RESULTS

Sample			1	2	3	4	5	6	Total
Acari	Scheloribatidae	*Scheloribates* sp.					1	1	2
Araneae	Philodromidae	*Philodromus signatus*					1		1
	Salticidae	*Hasarius adansoni*					1		1
	Theridiidae	*Latrodectus geometricus*					1		1
Collembola	Entomobryidae	*Entomobrya multifasciata*	6	224	2				232
Orthoptera	Acrididae	*Primnia sanctaehelenae*	1	1	1				3
Psocoptera	Ectopsocidae	*Ectopsocus strauchi*		21	84	32	19	8	164
	Liposcelidae	*Liposcelis* sp.						1	1
	Myopsocidae	*Myopsocus eatoni*		1	2	2	1		6
	Peripsocidae	*Peripsocus stagnivagus*	3	5		2			10
	Trogiidae	*Cerobasis annulata / guestfalica*	2	4	6	5	5	1	23
		Psocidae indet. (brachypterous)				1			1
Thysanoptera	Phlaeothripidae	*Haplothrips gowdeyi*		2	2		1		5
Hemiptera	Anthocoridae	*Cardiastethus exiguous*		4	8	11	17	4	44
	Anthocoridae	*Orius thripoborus*			5	6	2		13
	Aphididae	*Aphis craccivora*			1				1
	Aphididae	*Myzus persicae*		1					1
	Cicadellidae	*Balclutha saltuella*	32	65					97
	Cicadellidae	*Empoasca* sp.		1	1	1			3
	Cicadellidae	Selenocephalinae indet.			1	2			3
	Lygaeidae	*Nysius ericae*	24	7	11	17	192	180	431
	Lygaeidae	*Nysius sanctaehelenae*		2	4				6
	Miridae	*Creontiades pallidus*			1	7	17	6	31
Neuroptera	Chrysopidae	*Chrysopa zastrowi*	8	1	1	16	7		33
Coleoptera	Anthribidae	*Homoeodera alutaceicollis*	1		2	1	1		5
	Cerambycidae	*Curtomerus flavus*				1	2	1	4
	Coccinellidae	*Cheilomenes lunata*		4				1	5
	Coccinellidae	*Exochomus fllavipes*		1				1	2
	Coccinellidae	*Scymnus nubilus*	3	4	1	1	4		13
	Curculionidae	*Microxylobius westwoodi*	1				1		2
	Staphylinidae	Staphylinidae indet. (small)	1	1					2
Lepidoptera	Crambidae	*Helenoscoparia nigritalis*	4	16	2				22
	Crambidae	*Spoladea recurvalis*	1	2	2	11	5	1	22
	Erebidae	*Hypena helenae*					1	1	2
	Erebidae	*Hypocala rostrate*			1				1
	Gelechidae	*Phthorimaea operculella*		1					1
	Noctuidae	*Agrotis ipsilon*	2	1	2	2			7
	Noctuidae	*Agrotis segetum*					1	1	2
	Noctuidae	*Chrysodeixis dalei*		1					1
	Noctuidae	*Craterestra subvelata*	2						2
	Noctuidae	*Trichoplusia ni*		1	2				3
	Pterophoridae	*Agdistis sanctaehelenae*		1			5	8	14
	Tineidae	*Opogona* sp.	8	143	66	250	275	266	1008
Diptera	Agromyzidae	*Liriomyza brassicae*		1					1
	Agromyzidae	?*Phytomyza atricornis*				5			5
	Asteiidae	*Anarista vittata*	4	8	3	32	396	423	866
	Calliphoridae	*Calliphora croceipalpis*		1					1
	Calliphoridae	*Chrysomya chloropyga*				1			1
	Calliphoridae	*Lucilia sericata*	2				1		3
	Ceratopogonidae	Ceratopogonidae indet.	1	1	1				3
	Chironomidae	Chironomidae indet. (medium, black)	5						5
	Chloropidae	*Elachiptera sacculicornis*		1					1
	Chloropidae	Chloropidae indet.	1	1			34	3	39
	Culicidae	*Culex quinquefasciatus*					1		1
	Dolichopodidae	*Hydrophorous praecox*				2			2
	Dolichopodidae	*Syntormon pallipes*		1		2			3
	Drosophilidae	*Drosophila replete*					2		2
	Drosopilidae	*Drosophila simulans*	5	248	2	1			256
	Drosopilidae	*Scaptomyza* nr. *horaeoptera*	3	1					4
	Ephydridae	*Psilopa* sp.		2			5	61	68

	Ephydridae	*Scatella septemfenestrata*	2	16	2	27	1		48
	Fanniidae	*Euryomma peregrinum*	15	67	8	20	13	2	125
	Fanniidae	*Fannia canicularis*	1	6					7
	Limoniidae	*Dicranomyia loveridgeana*		1					1
	Limoniidae	*Trimicra pilipes*	1	1					2
	Lonchaeidae	*Lamprolonchaea smaragdi*						1	1
	Lonchaeidae	*Lonchaea avida*	1						1
	Muscidae	*Coenosia humilis*	1	1					2
	Muscidae	*Dasyphora cyanella*		1	1		1	2	5
	Muscidae	*Limnophora helenae*	870	828	1164	1651	832	113	5458
	Muscidae	*Stomoxys calcitrans*	1	1					2
	Mycetophidae	*Leia arsona*		1					1
	Phoridae	*Megaselia curtineura*	1		2		3	3	9
	Phoridae	Phoridae indet.	1	1				3	5
	Psychodidae	*Psychoda alternata*					2	1	3
	Sarcophagidae	*Sarcophaga redux*	1				1		2
	Scatopsidae	*Coboldia fuscipes*					1		1
	Scenopinidae	*Scenopinus* sp.					1		1
	Sciaridae	Sciaridae indet.	1	1	1	1			4
	Sphaeroceridae	*Sphaeroceridae* indet.		1			16		17
	Tachinidae	*Drino quadrizonula*		2					2
Hymenoptera	Ampulicidae	*Ampulex compressa*						2	2
	Bethylidae	*Holepyris atlanticus*		1	3	1	19	34	58
	Braconidae	*Aphidius colemani*	28	51					79
	Braconidae	*Cotesia vestalis*	7	25	9	2	5	6	54
	?Braconidae	?Braconidae nov. (flightless)	1	2	1				4
	?Braconidae	?Braconidae indet. (orange head, black body)	1						1
	Chalcididae	*Chalcis sodalis*		1					1
	Diapriidae	Diapriidae indet.				2			2
	Encyrtidae	*Copidosoma koehleri*		4	1		2		7
	Encyrtidae	*Rhopus* sp.	1		4				5
	Eupelmidae	*Macroneura swezeyi*					1		1
	Formicidae	*Cardiocondyla emeryi*					10	4	14
	Formicidae	*Nylanderia bourbonica*	4		4	1			9
	Formicidae	*Paratrechina longicornis*					1	13	14
	Formicidae	*Plagiolepis alluaudi*		2					2
	Formicidae	*Solenopsis globularia*	8	1	29	42	307	85	472
	Formicidae	*Tapinoma melanocephalum*					2	4	6
	Formicidae	*Tetramormium caldarium*	1						1
	Ichneumonidae	*Diadegma molliplla*			1		4	1	6
	Indet.	Hymenop. indet. (small, black, orange abdomen base)						1	1
	Platygastridae	*Platygaster* sp.		1	4	10	42	176	233
	Pteromalidae	*Peromalus ipsea*			1				1
Total taxa			43	59	42	34	48	35	103
Total specimens			1067	1796	1449	2168	2263	1449	10192
Total specimens (excluding *Limnophora helenae*)			197	968	285	517	1431	1306	4704

APPENDIX H – VEGETATION SURVEY RESULTS

DAFOR abundance categories: 1 – rare, 2 – occasional, 3 – frequent, 4 – abundant, 5 dominant.

Site	Bare earth	Rocks with crevices	White tungi	Red tungi	Ice plant	Babies' toes	Creeper	Dead creeper	Samphire	Purslane	Common saltbush	Green saltbush	Common goosefoot	St Helena goosefoot	Four-leaved allseed	Blue weed	Diddly dight	Tomato	Pagoda plant	Prickly sow thistle	Lantana	Willow	Tree tobacco	Wild mango	Loquat	Fishbone grass	*Ramalina* sp.	*Dimelaena triseptata*
UBG	3	1	1	1	2		1	1	3	1	1		1		1		1	1		1	1		1			1	1	
SO	4	1			1	1		1	3	1	1	1						1								1		
CPW	4				1	1			2	1	1	1	1													1		
BYD	4				2	1			3	1		1	1	1												1		
WS	4	1			1	1			2	1	1	1						1								2		
SBS	3	1			1	1		1	3	1	1	1	1	1												3	1	
SP	3	1			3				2	1			1													4		
SA	3	4			1		2	2	1	1	3		1					1					1			1	1	
CBE	4	1			1	1			2	1	1															1	1	1
B4	3	1			3			3			3															1	1	
B5	4	2			1	1			3	1	1	1														1		
B6	5					1			1	1		1	1	1												1		
B7	5	1				1			1	1	1															1		
C1	3	2	1		2		2	3			1				1		2	1		1						1	1	
C2	4	2			2		1	2			1		1		1		1	1								1	2	
C3	2	1			2			1	1	1	1															3	1	
C4	5	1			1	1		1	2	1	1															1		
C5	4				1				3	1	1	1	1													1		
C6	2	1			1	1			3	1				1												3		
C7	4				1	1		1	3	1																1		
D2	3	1			3		1	3		1		1			1		1	1									1	
D3	4	1			1				2	1	1						1	1								2	1	
D4	4				1				3	1																2	1	
D5	3				2				2	1			1													2		
D6	5				1	1			1	1																1		
D7	3	2			1			3		1	1															3	1	1

Site	Bare earth	Rocks with crevices	White tungi	Red tungi	Ice plant	Babies' toes	Creeper	Dead creeper	Samphire	Purslane	Common saltbush	Green saltbush	Common goosefoot	St Helena goosefoot	Four-leaved allseed	Blue weed	Diddly dight	Tomato	Pagoda plant	Prickly sow thistle	Lantana	Willow	Tree tobacco	Wild mango	Loquat	Fishbone grass	*Ramalina* sp.	*Dimelaena triseptata*
D2	3	1	1		2				1	2	1															2	1	
D3	4	1			1	1			2	1							1									2		
D4	3	4			1		1	3	2		1				1			1								1		
D5	2				1			2	3	1																4		
D6	5	1			1	1			1	1																1		1
D7	4	3			1	1		1	1	1	1										1					2	1	1
E3	5	1	2		2		1	1		1														1		1		
E4	3	1	1		1			2	1																	4		
E5	4	3			1		1	1	1	1	1					1										2	2	
E6	2	1			2		1	3	1	1	1															4		
E7	3				1	1		1	2	1																3		
E8	3	2						2	1	1	1															3	1	1
F2	4	1						1	1	1	2															2		1
F3	3	2			1				2	1	1	1	1		1		1	1	1							1	1	
F4	2	2		1	2		1	4	2	1	1				1		1	1								1	1	
F5	4	1					1	2	2	1	1															2	1	1
F6	3	1			1	1		1	3	1	1			1												3	1	1
F7	2	4			1			3		1	1	1		2	1			1	1	1					1	2	3	
F8																												
M1	2	1			4		1	1	2	1	1	1	1				1					1				1	1	
R1	3	1	1		2				1	2	1															2	1	
R2	4	1			1	1			2	1							1									2		
R3	3	4			1		1	3	2		1				1			1								1		
R4	2				1			2	3	1																4		
R5	5	1			1	1			1	1																1		1

APPENDIX I – INDIVIDUAL SPECIES INFORMATION

The table below gives a complete list of species that have been recorded from the survey area with comments on the ecology and status of endemic species and the status of invasive species.

Key to status: INNS – invasive non-native species that pose a particular threat to endemic species in this location; NN – non-native, I – indigenous, E – endemic species, EG – endemic genus and species, NS – new species, UNK – unknown, ? denotes uncertainty.

Key to abbreviations in comments section: * – indicates a new species added to the site species list during the current survey, PBP – Prosperous Bay Plain (when used in inverted commas it indicates that the record could also be from the wider area, outside that of the current survey area), EAA – Eastern Arid Area, BE1 – first Belgian expedition, BE2 – second Belgian expedition, BBE – both Belgian Expeditions, AS – the Ashmoles' 2003 survey, AG – the Ashmoles' 2004 invertebrate guide, PS – the Peaks survey 2005-6, SRS – the Southern Ridge Survey of 2012, DP – the Darwin Plus 2017 survey Malaise trap, CWS – common, widespread species, of no particular importance to the Prosperous Bay Plain fauna.

Site abbreviations used in comments: BYD – Basin Yellow Dust, CBE – Central Plain East, CPW – Central Plain West, SP – Samphire Plain, SBS, South Basin Samphire, SA – Stony Area, SO – Stony Outwash, UBG – Upper Bone Gully, WS – Widow Slope, R(followed by a number) – one of the 'random' samples, numbered according to the sites as defined in the main text.

Species believed to be confined to Prosperous Bay Plain are highlighted with the species name in ***bold red***.

Class	Order	Family	Species and common name	Status	Comments
Reptilia	Squamata	Gekkonidae	*Hemidactylus frenatus*	INNS	* Apparently confined to the north-east of the island during BBE. No mention of the species in AS. During this survey found at all sites except BYD and SBS; probably now at or near field capacity for the site. Species control recommended, if possible, as is generalist predator probably severely impacting endemic species.
Mollusca	Stylommatophora	Helicidae	*Cornu aspersum*	NN	CWS. Empty shells found widely across site, one live specimen found at SO. Probably present across site at low density, emerging in 'good' conditions to take advantage of conditions and breed.
		Succineidae	*Succinea sanctaehelenae*	ES	CWS. Found in the area by BE1 and AS. Mostly frequently found as empty shells, these found at SA, SP & UBG; live adults found at SO & R1. Probably present at low density all year with population increase following suitable breeding conditions. Known to feed on algae growing on plants.
		Valloniidae	*Vallonia excentrica*	NN	BE1, CWS.
		Zonitidae	*Oxychilus cellarius*	NN	BE1, CWS.
Arachnida	Acari: Oribatida	?Carabodidae	?*Carabodes* sp.	UNK	* Three specimens from a Berlese sample at SA in the third temporal sample; almost certainly endemic, only possible to identify to species level by a specialist.
		Liacaridae	*Liacarus coracinus*	NN	Probably CWS.
		Liodidae	*Liodes lanceosetosus*	ES	Seems to be CWS on the island, being found by most surveys from the peaks to desert areas, probably a generalist detritivore; seems to have a preference for drier areas.
		Scheloribatidae	*Scheloribates* sp.	?ES	* Neither BBE or AS reported mites of this family from PBP. It could be an overlooked undescribed endemic species or an endemic or non-native species that has filled a

					vacant niche; the author suspects it to be endemic, but specialist expertise would be required for a positive identification. Probably a generalist detritivore.
	Acari: Prostigmata	Anystidae	*Anystis berlesei*	NN	Probably CWS.
			Chaussieria benoiti	ES	This, along with the next three species, are extremely difficult to identify. Species described from six specimens from eastern and southern PBP during BBE. Two specimens, one from the main survey at SO and another from temporal sample 3 at the same site are *possibly* referable to this species.
			Chaussieria brevis	ES	Described from 11 specimens collected during BBE; no specimens referable to this species have been found during subsequent surveys.
			Chaussieria dissimilis	ES	Species described from a single male collected during BE2 on 09-14/04/1967. A single specimen *possibly* referable to this species was collected in a pitfall trap at SO in the fifth temporal sample.
			Chaussieria sanctaehelenae	ES	Species described from 56 specimens collected during BBE. Three specimens *possibly* belonging to this species were collected from CBE and SO during the current survey.
		Bdellidae	*Bdellodes longirostris*	NN	* Two specimens collected at Great Stone Top and above Cook's Bridge during BE2. Eight specimens *possibly* referable to this species were collected at SA and SO during the first and second temporal surveys.
			Bdellodes parvisetosa	ES	Described from two specimens collected on PBP during BE1. Found again at SP and also at 'Earwig Gully' outside the current survey area during AS. Possibly collected again during the North Runway Survey (Pryce & Paajanen, 2014). One specimen *apparently* referable to this species collected at UBG during the main survey and another at SA during temporal sample 1.
			Bdellodes quadrisetosa	ES	* Two specimens found at Sandy Bay Beach during BE1. During the current survey three specimens *apparently* referable to this species were found at SA and SO during the second temporal sample.
		Erythraeidae	*Cavannea cooremani*	ES	An EAA endemic, but not restricted to PBP itself. Described from 45 specimens collected on PBP during BBE. Found again outside the current study area during the North Runway Survey (Pryce & Paajanen, 2014). Not found during the current survey.
	Ioxida	Ixodidae	*Rhipicephalus evertsi evertsi*	NN	Red tick, BE1, probably still present in the area on rabbits.
	Scorpiones	Buthidae	*Isometrus maculatus*	INNS	Present in eastern, south-western and western PBP during BE1. Not found on PBP itself during AS or this survey. Possibly out-competed here by *Scolopendra morsitans*? Probably at field capacity; a generalist non-native predator, control is advised if possible.
	Pseudoscorpionida	Garypinidae	***Hemisolinus helenae***	EGS	Species described from eight specimens collected from the PBP area during BBE. One specimen, *apparently* referable to this species, collected at CPW during the main survey.
		Withiidae	***Sphallowithius excelsus***	EGS	Species described from 342 specimens collected from PBP during BBE. Found during AS at SBS and SP, but numbers not recorded; not found during the current survey. Species may have undergone a serious population crash or may normally be present at low density, responding to environmental conditions as they change.
	Araneae	Aglenidae	*Tegenaria domestica*	NN	Two records from eastern PBP from BE1, probably out-competed by other invasive non-native species, e.g. *Latrodectus geometricus* and *Steatoda* species.

		Corinnidae	*Xeropigo tridentiger*	INNS	Originally described as an endemic species from the island, but later discovered to be an invasive non-native species from Brazil. Prefers arid areas where it is a fast-moving aggressive predator. Probably at field capacity; little chance for species reduction or control.
		Dictynidae	*Archaeodictyna condocta*	?I	CWS.
		Eutichuridae	*Cheiracanthium wilma*	ES	A scarce endemic species described from three specimens collected from PBP during BB2; found more recently at Peak Dale. Requires further research to clarify distribution and status.
		Gnaphosidae	***Benoitodes caheni***	EGS	Described from 91 specimens collected during from PBP during BBE, but not been seen since. While the rediscovery of *Bonapruncinia sanctaehelenae* (see below) shows that it *could* (theoretically) be surviving somewhere in or around PBP, the relative abundance of this species during BBE, coupled with its apparent demise from all more recent surveys shows that, in the balance of probability, it has gone extinct.
		Linyphiidae	*Agyneta prosectes*	NN	* A scarce species found across the island, but seeming to have a preference for arid areas. During the main survey found at CPW, SO and UBG; found at SA and (most commonly) at SO during the temporal survey.
		Lycosidae	*Brevilabus* sp.	UNK	Small wolf spiders collected during AS from PBP may be referable to this genus; species status and ecology unknown. Research recommended.
			Hogna inexorabilis	ES	Species apparently present across the island, but at rather low density. Found on PBP during BE1. Found during the main survey at CPW (one female) and SBS (two males).
			Hogna ligata	ES	A widespread endemic species with a preference for wetter areas. A single record of a female from PBP during BE1 on 04/01/1966.
			Hogna nefasta	ES	Prowling wolf spider. Found to be very common to the south and south-east of Stone Hill during the second spider eye-shine survey; less common to the north and west of Stone Hill. Other records from AS show the species to be slightly more widespread in the EAA, but it appears to be at its maximum density in the area described above.
			***Lycorma* sp.**	?ES	An apparently new species found in the survey area at SBS during AS as well as at SRS site 'Earwig Gully', outside of the survey area; found again on 'PBP' during PR.
			Lycosa elysae	ES	Described from 1 male collected during BE2 on PBP. A single record from SP in AS. Two males from a pitfall at BYD, a juvenile from a pitfall at SP and one male and one female found at R3 during the this survey.
			Lycosa ringens	ES	Originally described from a single male collected in Fisher's Valley on 11-13/11/1965 during BE1. Found at SP during AS.
			Lycosidae sp. 3 (Mole spider)	EGS	Known to be present at the eastern edge of the site along the flanks of Stone Hill and towards the fence near the airport's DVOR installation. Also known to be present in a small area near the summit of 'Mole Spider Hill' just outside of the south-eastern corner of the current survey area. The third population is immediately to the east of Bradley's Camp. These three known sites have all been impacted to some extent or another by airport construction. It is of prime importance that this species is formally scientifically described so that it can be Red Listed for the IUCN. It is highly recommended that a university or museum be sought to secure funding for a PhD on the spiders of the island to resolve remaining taxonomic issues and determine more precisely the ecological

					preferences of the species in this invertebrate order. The Lycosidae are the most important group of invertebrates where this information has not yet been fully resolved and these comments are applicable to all species in this family of spiders.
			Lycosidae sp.	UNK	Immature lycosids, where identification was uncertain, recorded under this 'morphotype'.
			***Trochosippa* sp.**	?ES	Lurking wolf spider. An apparently new species discovered during AS where it was found at BYD, SBS, SP and 'Stone Hill Springs'; found again on 'PBP' during PR. The second spider eye-shine survey undertaken for this report found it to be relatively common across the site, but at greatest density to the south of Stone Hill. Holes similar to those of this species were seen more widely in areas where ground conditions appear suitable (more dusty areas across the Central Plain) so it may be more widespread than currently known. Holes look like someone has cleanly inserted a round pencil into the ground vertically.
		Oecobiidae	*Oecobius navus*	NN	See *Oecobiidae* indet. below.
			Oecobius similis		See *Oecobiidae* indet. below.
			Oecobius sp.	?NN	A total of four species of *Oecobius* have been recorded from PBP and the wider area of the EAA: *O. navus* and *O. similis*, above, plus '*Oecobius* sp. A' and '*Oecobius* sp. B', which are not precisely identified, from near adjacent sites. Without access to specimens or specialist knowledge it is therefore impossible to identify species as anything other than '*Oecobius* sp.'.
		Oonopidae	*Gamasomorpha insularis*	?I	CWS, preference for arid areas.
			Heteroonops spinimanus	NN	Scarce, found once on PBP during PS.
			Oonops erinaceus	ES	An enigmatic species known from three specimens from PBP (Ashmoles' surveys before 2000), Flagstaff and Prince Andrew School (BE2); more research required.
			Opopaea concolor	NN	CWS in arid areas. Not found during this survey, may be out-competed by other more aggressive species of spider.
		Philodromidae	*Philodromus signatus*	ES	CWS in arid areas but also found up to the High Central Ridge.
		Prodidomidae	*Prodidomus rufus*	UNK	A species previously found widely in the EAA. Not found during the current survey, but found nearby other recent ones. May be being outcompeted on site by *Latrodectus geometricus*, *Scolopendra morsitans* and *Steatoda* sp.
			Zimirina relegata	ES	A scarce endemic species with a preference for arid environments; found at PBP during BE2 and again during PS. Not found during this survey.
		Salticidae	*Hasarius adansoni*	NN	CWS, with a preference for arid sites.
			Pellenes inexcultus	ES	Common endemic species with a preference for arid areas; found widely across the site by most surveys.
			Salticidae indet.	UNK	Salticid spiders are notoriously difficult to identify; all juvenile spiders of this group were examined and, where identification was uncertain, assigned to this 'morphotype'.
		Segestriidae	*Segestria florentina*	NN	Only a single record of this species from southern PBP during BE1; unlikely to pose a serious current threat to endemic species, probably outcompeted by other predators.
		Selenopidae	*Anyphops stauntoni*	NN	Ditto.
		Sicariidae	*Loxosceles rufescens*	?I	A probably indigenous species CWS in the EAA.
		Theridiidae	*Latrodectus geometricus*	INNS	Brown widow spider. CWS across PBP and other more arid parts of the island.

					Particularly common along the streambed from UBG to SO and further onto PBP. Could well be having a serious ecological impact on endemic species through direct predation; probably at field capacity, little chance of species control.
			Parasteatoda tepidariorum	NN	Only found once on PBP during BE1 on 02/12/1965; probably out-competed here by *L. geometricus* and *Steatoda* sp.
			Steatoda capensis	INNS	From the records, this and the next species appear to be equally common on PBP, but not as common as *L. geometricus*. All three of these species pose a significant threat to endemic species through direct predation; both *Steatoda* are probably at field capacity and there is little chance of species control.
			Steatoda grossa	INNS	Ditto.
			Steatoda sp.	INNS	All juvenile specimens of this genus were recorded as *Steatoda* sp. as identification of adults to species level is often difficult, and almost impossible for juveniles.
			Theridiidae sp. 1	UNK	A single female specimen discussed in PR. Collected at night on PBP on 16/02/2006 it could belong to the genus *Enoplognatha*.
		Thomisidae	***Bonapruncinia sanctaehelenae***	EGS	An endemic genus and species described from two juvenile females collected on 26/11/1965 during BE1. Not found by AS or during other more recent surveys. One adult female found at SO in the second temporal sample, one adult male found at SA during the fifth temporal sample; these sites are 400m apart and both specimens were found by Berlese extraction from dead wood and plant litter material including Samphire, dead Common saltbush and dead Creeper. Precise ecology unknown but probably an ambush predator on medium- to large-sized Samphire twigs (deduced from endemic status, general ecology of Thomisids, cryptic colouration and size). A note appended to the description of the species (Benoit *et al.*, 1977) states, in translation from the French: "*Bonapruncinia sanctaehelenae*, probably the only endemic Thomisid on the island, certainly seems to be a rare species; but it is especially difficult to find because of its mimetic coloration with the gravelly sand of southern Prosperous Bay Plain. Its dispersal range could be very small and limited to a few tens of square meters, as the case often occurs in St. Helena for endemic and xerophilic species." To find two mature specimens of this remarkably easy to identify species, 400m apart on PBP, indicates that the species, while still obviously very rare, maintains a viable population and *could* possibly be present at other nearby locations.
		Thomisidae	*Runcinia grammica*	NN	CWS; one record from BE1.
Malacostraca	Isopoda	Platyarthridae	*Niambia capensis*	NN	* A scarce species found sporadically across PBP, not previously recorded in the survey area.
		Porcellionidae	*Porcellio laevis*	NN	It did not prove possible to identify this and the next species reliably by sight in the field, all sightings were therefore identified as *P. laevis* / *pruinosus*.
			Porcellionides pruinosus	NN	See above
Diplopoda	Julida	Julidae	*Ommatoiulus moreleti*	NN	CWS; most specimens found as dead fragments amongst litter or in pitfall traps. Probably present at low density all year with population increase during suitable breeding conditions. Strangely, although found nearby, not recorded in the survey area before.

Chilopoda	Geophilomorpha	Geophilidae	***Tuoba benoiti***	ES	Found twice at eastern PBP during BE1 (seven specimens) and at CPW and SBS during AS (four specimens); not found during the current survey. It is possible that this species is in decline due to competition with other INNS (e.g. *Scolopendra morsitans*), however, its continuing presence should not be written off as it may be present here or in other nearby areas. Further targeted research recommended. Probably a generalist predator on smaller invertebrates.
	Scolopendromorpha	Scolopendridae	*Scolopendra morsitans*	INNS	Widespread across PBP. A voracious, aggressive predator that is almost certainly having a serious negative impact across the site. Low probability of species reduction / control.
		Cryptopidae	*Cryptops basilewskyi*	ES	While not restricted entirely to PBP, the other known locations for this species are Bryan's Rock, Government Flat Garage (Bradley's) and the Samphire above Holdfast Tom, making this an EAA specialist endemic. Three specimens were collected from SA during the main survey. Probably a generalist predator on smaller invertebrates.
			Cryptops hortensis	NN	* Mainly associated with wetter areas along the High Central Ridge, one record from lower Rupert's Valley. Three records from the current survey: at SO during the main survey and in temporal sample 5 and SA during the main survey.
	Scutigeromorpha	Scutigeridae	*Scutigera coleoptrata*	INNS	Found at south-western PBP during BE1 and at CBE in rock piles during this survey. As a generalist predator the presence of this species is unwelcome in the area, but it is probably out-competed by *Scolopendra morsitans* across most of the site; little chance of control.
Collembola	Entomobryomorpha	Entomobryidae	*Entomobrya multifasciata*	NN	CWS.
		Entomobryidae	*Lepidocyrtus lanuginosus*	NN	Only a single record from PBP from PS.
	Poduromorpha	Hypogastruridae	*Shoetella ununguiculata*	NN	Only a single record from PBP from PS.
		Poduridae	*Brachystomella parvula*	NN	Only a single record from PBP from PS.
			Xenylla yucatana	NN	Probably reported in error; on further examination all species from this area appear to be referable to *X. grisea* (below).
			Xenylla grisea	NN	* CWS. See above.
	Symphypleona	Bourletiellidae	*Deuterosminthurus pallipes*	NN	Only a single record from PBP from PS.
Insecta	Zygentoma	Lepismatidae	*Ctenolepisma longicaudata*	NN	Appears to be CWS in more arid areas.
		Lepismatidae	*Ctenolepisma sanctaehelenae*	ES	Found widely in PBP during BBE and AS. Only found at CBE and SO during the current survey. There appears to be some association with the endemic darkling beetle *Tarphiophasis leleupi*, with both often being found together.
		Lepismatidae	*Lepisma saccharina*	NN	CWS, tramp species.
	Odonata	Libellulidae	*Pantala flavescens*	I	Circumtropical migrant, occasionally reaching the island; anecdotal evidence of breeding. One specimen attracted to light during airport construction.
	Blattodea	Blaberidae	*Nauphoeta cinerea*	NN	CWS, tramp species.
			Pycnoscelus surinamensis	NN	CWS, tramp species.
		Blattidae	*Periplaneta australasiae*	NN	CWS, tramp species.
		Corydiidae	*Euthyrrhapha pacifica*	NN	CWS, tramp species.
		Ectobiidae	*Balta longicercata*	NN	CWS, tramp species.
	Orthoptera	Acrididae	*Primnia sanctaehelenae*	ES	CWS across the site and wider dryland areas. A herbivore, possibly associated with dryland species such as Samphire or Fishbone grass.
			Tinaria calcarata	ES	One record from BE2; generally CWS in wettest areas.

		Gryllidae	*Gryllus abnormis*	ES	Found on PBP by BE1. While being found recently at the Millennium Forest and Bank's Valley it has not been seen on PBP since 1965. *G. bimaculatus* is now nearly ubiquitous across the site, so it has probably been out-competed by this species. The arrival of a specialist ground cricket predator (*Liris haemorrhoidalis*) is of real concern as this endemic species is brachypterous and thus less likely to be able to escape attack by *Liris*, which will put it at increased risk and could *potentially* drive the species towards extinction.
			Gryllus bimaculatus	NN	BBE, AS, CWS.
		Mogoplistidae	*Cycloptiloides canariensis*	NN	* Appears to be CWS in more arid areas. Found at SA and UBG in the main survey and SA, SO and R1 in the temporal surveys.
	Dermaptera	Anisolabididae	*Euborellia annulipes*	NN	BE1, AS, CWS.
		Labiduridae	*Labidura herculeana*	ES	While there are no confirmed records, this species is likely to have been present in the past, before any systematic recording began. Species now declared extinct.
			Labidura riparia	NN	BBE, Pryce (2016), CWS.
	Psocoptera	Ectopsocidae	*Ectopsocus strauchi*	NN	CWS.
		Liposcelidae	*Liposcelis bostrychophila*	NN	A scarce species. Identification complicated by the presence of two undifferentiated species from AS / AR (below). All specimens from this study therefore recorded as *Liposcelis* sp.
			Liposcelis sp. 1	UNK	See above.
			Liposcelis sp. 2	UNK	See above.
			Liposcelis sp.	UNK	See above.
		Myopsocidae	*Myopsocus eatoni*	NN	Has a preference for middle and lower elevations; common and widespread on PBP.
		Peripsocidae	*Peripsocus stagnivagus*	NN	* CWS.
		Psocidae	*Blaste basilewskyi*	ES	A CWS endemic species found across the island but less commonly in arid areas; two specimens from DP in sample PROS 07.
		Trogiidae	*Cerobasis annulata*	NN	CWS across the island with a preference for drier areas. Differentiating this species from *C. guestfalica* was only found possible right at the end of the study, all records have therefore been recorded as *C. annulata* / *guestfalica*.
			Cerobasis guestfalica	NN	CWS on PBP; has a marked preference for arid sites.
			Helenatropos abrupta	UNK	Described as an endemic genus and species but since found in South Africa; could be either indigenous or non-native.
			Trogiidae indet.	UNK	* A uniformly grey species with small wings. Possibly endemic, needs further research.
		Psocidae indet.	Family indet.	UNK	* A pale body with a dark head and brachypterous wings. Probably not endemic since seen at author's house (Pink Grove, Levelwood); may be new non-native sp. or previously unrecorded brachypterous form of known sp. Needs further research.
	Thysanoptera	Phlaeothripidae	*Haplothrips gowdeyi*	NN	CWS.
		Thripidae	*Heliothrips haemorrhoidalis*	NN	CWS.
	Hemiptera	Anthocoridae	*Cardiastethus bicolor*	ES	* Not record from PBP before. Found at every site except CBE during the main and temporal surveys, additionally at R4. A CWS endemic species; use of BugVac responsible for its widespread discovery here.
			Cardiastethus exiguus	?I	CWS in more arid environments.
			Orius thripoborus	NN	CWS.

		Aphididae	*Aphis craccivora*	NN	CWS, tramp species.
			Myzus persicae	NN	* CWS, tramp species.
		Cicadellidae	*Balclutha saltuella*	?I	CWS.
			Empoasca sp.	NN	* CWS, probably tramp species.
			Sanctahelenia decellei	EGS	* DP survey, one specimen from sample PROS 08. As no host plants (Gumwood, *Commidendrum robustum*) nearby, could potentially be wind-blown individual or possible mis-identification for *Balclutha saltuella* or *Empoasca* sp. Specimen requires checking.
			Selenocephalinae indet.	NN	CWS. An *apparently* undescribed species that has made it to the island from Africa and undergone a population explosion. Only currently known larval food plant is Wild mango (*Schinus terebinthifolius*), but suspected to be polyphagous by the author.
		Cydnidae	*Aethus pallidipennis*	NN	Burrower bug. CWS in more arid environments, but seldom encountered due to primarily sub-surface life-cycle; most often found in pitfall traps.
		Lygaeidae	*Nysius ericae*	?I	CWS, appears particularly common on Common saltbush and maybe also Samphire.
			Nysius sanctaehelenae	ES	CWS. Occurs across the island, probably polyphagous, appears not to be under threat at the present time; *probably* on Samphire at PBP.
		Miridae	*Creontiades pallidus*	?I	CWS, most commonly found on Common saltbush..
			Hirtopsallus suedae	EGS	Apparently only found on Samphire (hence the specific name *suedae*); not present at high density on PBP but at other sites (e.g. Rupert's Valley) it can be very numerous; not known why this discrepancy occurs, more research required.
			Taylorilygus apicalis	?I	CWS.
			Trigonotylus tenuis	NN	* CWS.
			Tropiconabis capsiformis	NN	* CWS.
		Monophlebidae	?*Pulvinariella mesembryanthemi*	NN	CWS, on Creeper (*Carpobrotus edulis*), from photograph by Roger Key; awaiting precise confirmation (Chris Malumphy, pers. comm.).
		Tingidae	*Teleonemia scrupulosa*	NN	Introduced biocontrol for *Lantana camara*.
	Neuroptera	Chrysopidae	*Chrysoperla zastrowi*	NN	CWS.
	Coleoptera	Anthicidae	*Anthicodes fragilis*	EGS	Found at 'PBP' during BE1 and at seven sites during AS, plus at a few other sites in the EAA. Found at all sites except UBG during the main survey. Resting adults can be found under rocks or other objects that lie on the surface but have an obvious gap underneath them through which air can flow; rocks embedded in the surface do not generally harbour this species. It is possible, at the right time of the year (November-January) to find up to thirty or forty individuals under a particularly 'attractive' rock; the best of these sites appears to be along the track at SBS (field observation) where a landscape-scale wind gap produces optimal or near-optimal microhabitat requirements (further research required). Adults and larvae are probably saprophagous, feeding on dead or decaying plant material.
		Anthribidae	*Homoeodera alutaceicollis*	EGS	One of the commonest fungus weevils on St Helena. No known host plant associations. Found at scattered sites on PBP by BE2, AS and the current survey.
			Homoeodera coriacea	EGS	A slightly enigmatic species. Originally described by T.V. Wollaston from Peak Dale and Plantation, suggesting that it was associated with Gumwood (*Commidendrum robustum*) which was present at both sites at the time. Now seems to be associated

					with Samphire (*Suaeda fruticosa*). Not found at PBP during BBE. Found at BYD, SBS and UBG during AS and in the Malaise trap during DP (one specimen in sample PROS 02). Not found during the current survey, but this pattern of records could suggest that this particular habitat is sub-optimal for the species with numbers fluctuating according to conditions.
			Homoeodera longefasciata	EGS	Described from more than 250 specimens from BE2 where it was found in the Horse Point / Holdfast Tom area (13 specimens) and PBP (244 specimens). During AS it was only found at SO and UBG. In the current survey it was found at BYD, CBE, CPW, SA, SP, SP, WS and samples R2 and R5. The species was most often found using hand searching, pitfall trapping and Berlese extraction (most specimens). It could be that numbers of this species fluctuate from year-to-year. It appears to be associated with Samphire (*Suaeda fruticosa*).
			Homoeodera scolytoides	EGS	Described from material collected at 'PBP, eastern' during BE1. Found again by AS at 'Plateau Triangulation Point' which now lies almost precisely under the centre-line of the new Airport runway. Not found during the current survey. Could *potentially* be found to the east of the airport; further survey work required, otherwise *potentially* extinct.
			***Homoeodera* sp. 2**	EGS	New species found during the airport DVOR fence-line survey (Pryce, 2016). Found again since by Howard Mendel (Natural History Museum, London) at the same site. Not found elsewhere during the current survey. Appears to be a very highly restricted endemic species that is present near the DVOR at the eastern edge of the current survey area; in the process of being described as a new species. Ecology unknown, probably associated with dead wood, most likely Samphire, plus specific (currently unknown) microhabitat requirements.
		Carabidae	*Aplothorax burchellii*	EGS	No records from PBP, but probably present here in the past. May possibly have gone extinct. More research required.
			Calosoma chlorostictum	I	CWS. Used to be regarded as an endemic subspecies *C. c. helenae*; has since been synonymised.
			Harpalus prosperus	ES	Described from three specimens from BE2, two from PBP and one from near Cuckhold's Point; also found since at the Millennium Forest (2011). Found at SA, CBE and R1, all in pitfall traps during the first temporal sample, so potential seasonal 'abundance' of adults.
			Harpalus sanctaehelenae	ES	* Despite seeming to have a preference for middle and lower elevations on the island, not recorded from PBP before. One specimen found at CBE during the main survey by BugVac and six in pitfall traps at SA during the fourth temporal sample.
			Laemostenus complanatus	NN	CWS.
		Cerambycidae	*Curtomerus flavus*	NN	CWS.
		Cleridae	*Necrobia rufipes*	NN	Seems to prefer more arid areas of the island; one specimen under a dead rabbit near Widow Slope, 28/10/2016. Very definitely confined to specific areas by presence of desired microhabitat – dead animals at or near the end of putrefaction.
		Coccinellidae	*Cheilomenes lunata*	?I	CWS.
			Exochomus flavipes	NN	CWS.

			Nephus binaevatus	NN	CWS.
			Scymnus nubilus	?I	* CWS; strangely not recorded from PBP before.
		Corylophidae	*Sericoderus lateralis*	NN	CWS.
		Curculionidae	*Acanthinomerus angustus*	EGS	* A less common endemic weevil. Three specimens found at SA in temporal samples 1 and 3 respectively. Most usually associated with Gumwood (*Commidendrum robustum*), but other records show that is probably also on Scrubwood (*Commidendrum rugosum*) and maybe also Samphire (*Suaeda fruticosa*), most likely in this case.
			Acanthinomerus armatus	EGS	A fairly common endemic weevil associated with Samphire (*Suaeda fruticosa*). Commonly collected on PBP by BBE, but only collected at BYD and SP during AS. Found at nearly all sites during the current survey, so probably CWS in EAA.
			Isotornus proximus	EGS	While not a PBP specialist, most records are from this area; also found in the past at Sandy Bay, the Asses Ears, Castle Rock Plain and Lower House Plain. Seems to be associated with dead Samphire (*Suaeda fruticosa*) and Tea plant (*Frankenia portulacifolia*) but could potentially be on other species. Species likely to have had minor impact during airport development, although this can not be confirmed scientifically.
			Microxylobius lucifugus	EGS	A common endemic weevil at middle and upper elevations. Found during AS at SBS.
			Microxylobius westwoodi	EGS	The commonest endemic weevil on the site, larvae appear to bore the thinner dead wood of Samphire (*Suaeda fruticosa*) and adults are found almost exclusively on these bushes. Almost ubiquitous across the site. A key indicator of Samphire 'health' across the island – where this species is present and removing the associated dead wood, Samphire plants appear 'healthy'; where not present, the Samphire plants appear 'twiggy' and 'unhealthy' (author's own observations).
			Pericartius aequatorialis	NN	CWS in arid environments; probably a generalist detritivore.
			Phlyctinus callosus	NN	CWS.
			Pseudostenoscelis compositarum	EGS	* A total of 15 adults were found at SA during the first three temporal samples. This species is more normally associated with wetter areas of the island, so its presence here is mysterious.
		Dermestidae	*Dermestes maculatus*	NN	CWS in arid environments with suitable microhabitat (desiccated, dead animals).
		Elateridae	*Anchastus compositarum*		See note for *Anchastus* sp. below.
			Anchastus sp.		Howard Mendel (Natural History Museum, London) is currently working on the taxonomy of the genus *Anchastus* on St Helena. It is *possible* that the historical specimens of *A. compositarum* from PBP belong to a new species; however, a final resolution of this issue will only be possible on publication of his paper. Almost certainly a soil insect predator.
		Histeridae	*Saprinus bicolor*	NN	* Several specimens found under a dead pigeon on the track near the Diplomatic Wireless Station building on 22/08/2018. Species distribution limited by scarce distribution of microhabitat – nearly or totally dessicated dead animals.
			Saprinus cupreus	NN	BE1 on PBP. Two other records from Horse Point and Mulberry Gut during BE2. Currently possibly overlooked, or possible local extinction, requires precise microhabitat that is scarce in region (See *S. bicolor* above).
		Latridiidae	*Adistemia watsoni*	NN	Two records, one from PBP in AS / AR, the other from Rupert's Valley.

		Ptinidae	*Xyletomerus insulanus*	ES	Associated with Samphire (*Suaeda fruticosa*). Presence of species often marked by the presence of larger (2-3 mm) bored holes in dead Samphire basal stems / plant bases / roots. No evidence of obvious decline. Probably CWS where there is abundant Samphire.
		Scarabaeidae	*Mellissius adumbratus*	EGS	See note for *Mellissius* sp., below.
			Mellissius oryctoides	EGS	Possibly the only easily identifiable species of the genus (see note below). One specimen found on PBP during BE2; found twice in the Dry Gut area during the Southern Ridge survey. Probably threatened by INNS and may have been extirpated from PBP itself by this pressure as no dead specimens found during the current survey.
			Mellissius sp.	EGS	Howard Mendel (Natural History Museum, London, pers. comm.) believes that this genus is in need of revision and that all species except possibly *M. oryctoides* can only reliably be determined to species level by dissection of the penis. It is likely that all specimens found during this survey do actually belong to *M. adumbratus*, however, all specimens found were either dead or fragmentary remains. It is possible that this species is under severe pressure from INNS at this site, in particular *Hemidactylus frenatus*, *Scolopendra morsitans* and *Latrodectus geometricus*. However, it is also possible that the species is generally present at low densities here, and periodic 'good' spells (climatically) may bring about population explosions. More research required.
		Staphylinidae	Staphylinidae indet.	UNK	A small, thin, brown species, could potentially be endemic, more research required.
		Tenebrionidae	*Gonocephalum simplex hadroides*	ES	Endemic subspecies. CWS in arid areas of the island. Precise biology unknown but other larvae of the genus feed on roots underground, maybe Samphire as it an endemic subspecies?
			Hemasodes batesi	NN	CWS in arid areas of the island, particularly PBP.
			Helenomelas basilewskyi	EGS	A total of 420 specimens were collected during BBE; the species has not been encountered since. It is most likely that this species is now extinct.
			Pseudoleichenum benoiti	EGS	A total of 2900 specimens of this species were collected during BBE. During AS the species was found at BYD, CBE, CPW, SBS, SP and WS. During the DVOR fence line survey a total of four specimens were encountered (Pryce, 2016), generally under more deeply embedded rocks (author's own observations). It was not found during the current survey. It is very likely that this species is now highly restricted and may be headed towards extinction. As the species seems to live under more deeply embedded rocks *Scolopendra morsitans* is the most likely threat to this species, although *Hemidactylus frenatus* and *Latrodectus geometricus* may also be playing a rôle in its decline.
			Tarphiophasis decellei	EGS	A total of just over 1600 specimens were collected during BBE. One adult was found at CBE during AS. Six specimens were collected during the airport DVOR fence line survey (Pryce, 2016), generally under more deeply embedded rocks (author's own observations). It was not found during the current survey. It is very likely that this species is now highly restricted and may be headed towards extinction. As the species seems to live under more deeply embedded rocks *Scolopendra morsitans* is the most likely threat to this species, although *Hemidactylus frenatus* and *Latrodectus geometricus* may also be playing a rôle in its decline.

			Tarphiophasis insulanus	EGS	A total of 1020 specimens were collected during BE2. During AS 'a few' were found at SBS. It was not found during the current survey. It is very likely that this species is now highly restricted, or at the brink of extinction. As the species lives under rocks *Scolopendra morsitans*, *Hemidactylus frenatus* and *Latrodectus geometricus* are likely the most significant threats to this species.
			Tarphiophasis leleupi	EGS	This species was described from 2600 specimens collected during BBE. AS found it at SO in the current survey area, but also at a further three nearby sites as well. During the present survey a total of six live and 13 dead specimens were found, the live ones being at SA (two specimens) and CBE (three specimens) during the temporal survey and 1 adult at WS during the main survey. It appears that this species has undergone a serious population reduction and may well be heading towards extinction. As the species lives under rocks *Scolopendra morsitans*, *Hemidactylus frenatus* and *Latrodectus geometricus* are probably the most significant threat to this species. There appears to be some conspecific association with the endemic silverfish *Ctenolepisma sanctaehelenae*, with both species often being noted together (author's personal observations).
			Tarphiophasis wollastoni	EGS	This species was described from four specimens collected during BE2; it has not been seen since. As the species was obviously the rarest of this group of beetles present on the site in the 1960s, it is very likely that this species has now gone extinct.
	Lepidoptera	Crambidae	*Herpetogramma licarsisalis*	EGS	A very CWS endemic. Probably on grasses.
			Helenoscoparia nigritalis	EGS	A very CWS endemic. On grasses.
			Spoladea recurvalis	NN	CWS.
		Erebidae	*Hypena helenae*	ES	A fairly CWS endemic, seems to prefer drier areas, ecology unknown.
			Hypocala rostrata	NN	CWS.
			Ophiusa tirhaca	NN	CWS.
			Pandesma robusta	NN	CWS.
		Gelechidae	*Phthorimaea operculella*	?I	First found in 2013. Seems to prefer drier areas. One female in the second Malaise trap sample.
		Geometridae	*Scopula separata*	ES	A fairly common endemic species. Seems to prefer drier areas. Found at BYD, UBG and WS during AS. Found at UBG by searching during the main survey by hand searching / sweep netting.
		Noctuidae	*Agrotis ipsilon*	?I	CWS.
			Agrotis segetum	NN	CWS.
			Aletia ptyonophora	ES	A CWS endemic generally found at middle and lower elevations. One specimen in a Malaise trap from the North Runway Survey (Pryce & Paajanen, 2014); one specimen from the DP Malaise trap in sample PROS 07.
			Anomis flava	NN	CWS at middle and lower elevations; a single specimen in DP sample PROS 10.
			Chrysodeixis dalei	ES	A relatively CWS endemic found across the island. Two specimens found in DP Malaise trap sample PROS 05, on in Malaise sample 2 during the current survey.
			Condica pauperata	NN	* CWS.
			Craterestra subvelata	ES	A CWS endemic, found widely across the site during AS. Only two specimens found in Malaise trap sample 1 during the current survey. Ecology unknown; may be in decline at this location.

			Ctenoplusia limbirena	NN	CWS.
			Leucania loreyi	I	The only known record is from SP during AS.
			Spodoptera littoralis	?I	CWS; seven specimens from DP samples PROS 04-06.
			Trichoplusia ni	?I	* CWS; this survey, three specimens from Malaise trap samples 2 and 3.
		Nymphalidae	*Danaus chrysippus orientis*	I	CWS.
			Hypolimnas misippus	I	Yearly migrant to the island, breeds sporadically when the larval food plant, Purslane (*Portulaca oeleracea*), is abundant when they arrive, maybe once a decade or so.
		Pterophoridae	*Agdistis sanctaehelenae*	ES	Found at SP during AS. 15 specimens from Malaise trap samples 2 and 5 and 6; one male from SA in the fourth temporal sample by BugVac. Seems to prefer middle elevations on the island but ecology unknown. Larve phytophagous on an unknown plant or plants.
		Pyralidae	*Cactoblastis cactorum*	NN	Introduced biocontrol for *Opuntia elatior* and *O. ficus-indica*.
		Tineidae	*Opogona divisa*	ES	Although endemic, appears to be CWS. Ecology unknown.
			Opogona sp.	ES	Includes the 'Tineidae n. sp. 'd'' and 'Tineidae n. sp. 'e'' of AG / AS. It is probable that there are at least six species (three [maybe more] fully winged, two [maybe more] brachypterous, plus the species below) present on PBP. The distributions of these species is likely to be wider than just PBP itself, however, there has been insufficient survey work to determine their distribution or ecology. In order to determine the precise species present it will be necessary to send these specimens to Timm Karisch (Museum für Naturkunde und Vorgeschichte, Dessau, Germany) who is currently working on a monograph of the genus on St Helena.
			***Opogona* sp. (brachypterous, fat)**	ES	* A single female specimen collected using 'BugVac' near the summit of Stone Hill on 24/12/2018 apparently represents a distinct new species; Philip and Myrtle Ashmole may have a couple more specimens of this scarce species in their collection, potentially including a male (Timm Karisch pers. Comm.). Unfortunately, the current specimen was collected into isopropyl alcohol, rendering it unusable for DNA analysis. A further survey using the same technique on 05/02/2019 failed to locate another specimen. Should Timm Karisch fail to recover viable DNA samples from the specimens held by the Ashmoles, it is recommended that this survey be repeated one further time, around mid-December 2019 with the object of recovering a further specimen from which a DNA sample could be recovered.
	Diptera	Agromyzidae	*Liriomyza brassicae*	NN	* One male from Malaise trap sample 2. Probably CWS in wetter parts of the island.
			?*Phytomyza atricornis*	NN	* Only known previously from Great Stone Top and lower Rupert's Valley during BE2. Specimens collected at several sites during the current survey, however, identification is not certain and the specimens should be checked by a specialist.
		Asteiidae	*Anarista vittata*	ES	Originally described as a very rare endemic species. Information from more recent surveys by the author, plus data from this survey, in particular the Malaise trap, has shown that the species is very much more widespread and (during this survey) can be seasonally common. From the author's observations, it appears to be associated with grasses in a dryland environment, most likely Fish-bone grass (*Eragrostis cilianensis*); however, whether it is associated with the grass itself or fungi associated with the breakdown of the plant or its roots (most likely), the true biology of the larva is

					unknown.
		Calliphoridae	*Calliphora croceipennis*	NN	* CWS.
			Chrysomya chloropyga	NN	* CWS.
			Chrysomya putoria	NN	CWS.
			Lucilia sericata	NN	CWS.
		Ceratopogonidae	Ceratopogonidae indet.	UNK	UNK.
		Chironomidae	Chironomidae indet.	UNK	* A small (~2.5mm) black species; could possibly be an undescribed endemic species as nobody has worked on this group. More research required.
		Chloropidae	*Cadrema pallida*	?I	Rare. Found during DP in samples PROS 05 and 06 (six and one specimens respectively). Only previous record from lower Rupert's Valley during BE2; specimens should be double-checked to check identification as there are several species present on the island that we know little or nothing about.
			Chloropidae indet.	UNK	* A small, mainly yellow species with some black markings and metallic green eyes.
			Elachiptera sacculicornis	NN	CWS.
			Siphunculina striolatus	?I	Rare. A single record from south-eastern PBP during BE2.
		Chyromyidae	*Aphaniosoma approximatum*	?I	Scarce. A single record from the North Runway Survey (Pryce & Paajanen, 2014).
			Gymnochiromyia flavella	?I	* Rare. First record from PBP in sample R1.
		Culicidae	*Culex quinquefasciatus*	NN	* Five-banded mosquito, CWS. First record from PBP, Malaise trap sample 4 – 1 male.
		Dolichopodidae	*Hydrophorous praecox*	NN	* Seems only to be present in the Fisher's Valley / PBP area.
			Syntormon flexibilis	NN	CWS.
			Syntormon pallipes	NN	* Only previously reported from the High Central Ridge area. One female from Malaise trap sample 2 and two females from Malaise trap sample 4.
		Drosophilidae	*Drosophila punctatonervosa*	NN	CWS.
			Drosophila repleta	NN	CWS.
			Drosophila simulans	NN	CWS.
			Scaptomyza nr. *horaeoptera*	EN	* Patterned wings similar to *S. horaeoptera*, but less densely marked. Could be a desert form of *horaeoptera*, or potentially a new subspecies. One male and two females from Malaise sample 1, one female from Malaise sample 2.
			Scaptomyza pallida	NN	* CWS.
			Zaprionus tuberculatus	NN	* CWS.
		Ephydridae	*Psilopa* sp.	UNK ?EN	Found at UBG and Stone Hill Springs during AS. Found at all sites during the main survey, 'random' sites 1, 2 and 5, and samples 2, 5 and 6 in the Malaise trap. *Psilopa* larvae are recorded as mining the leaves of Chenopodiaceae. As this species has only ever been found on PBP it has the *potential* to be an undescribed endemic.
			Scatella septemfenestrata	NN	Found at SO and SP during AS. One specimen from DP in sample PROS 04. Found in all but the 6th Malaise trap samples during the current survey (48 specimens in total). Also found at UBG (one specimen) during the main survey and one specimen by searching at R1.
		Fanniidae	*Euryomma peregrinum*	NN	CWS.
			Fannia canicularis	NN	* CWS.
		Limoniidae	*Dicranomyia loveridgeana*	ES	A CWS endemic of the middle levels of the island. Found during AS at SP. A single female found during the current survey in Malaise trap sample 2.

			Trimicra pilipes	?I	CWS in drier parts of the island, although generally with fresh water nearby (e.g. Fisher's Valley).
		Lonchaeidae	*Lamprolonchaea smaragdi*	NN	CWS; one female in Malaise trap sample 6. Specimens from DP may be confused with *Psilopa* sp. as they are superficially similar and could easily be mistaken, thus specimens from the DPLUS040 survey assigned to this species should be double-checked.
			Lonchaea avida	NN	CWS.
		Milichiidae	*Milichiella lacteipennis*	NN	CWS. First found at PBP during PS. One specimen in the DP Malaise trap, sample PROS 05. Seen during the current survey at SBS and WS during the main survey.
		Muscidae	*Atherigona orientalis*	NN	Rare. Three specimens collected during DP with one specimen in sample PROS 05 and two in PROS 06.
			Coenosia humilis	NN	* CWS. One female each in Malaise samples 1 and 2.
			Dasyphora cyanella	NN	CWS. One female each in Malaise samples 2, 3 and 5.
			Hydrotaea capensis	NN	Scarce. Ten specimens collected in DP Malaise sample PROS 04; specimens should be double-checked to be certain of ID.
			Limnophora helenae	ES	This species is very CWS in the more arid areas of the island, especially PBP, where it is the dominant species of fly. While it was initially thought possible to determine males and females by size and shape, this has proved incorrect. It is now known that females have eyes separated by about a third of the width of the head (viewed dorsally) whereas males have the eyes touching, or nearly so. Males are extremely rare, making up less than 0.5% of the population as collected by the Malaise trap in this survey; it is therefore possible that the '*Limnophora* sp.' from DP (below) was the only male encountered; more research is required. Most larval *Linmophora* appear to be aquatic, however, some exotic forms appear to breed in dung (unlikely here) or decaying plant matter or (most likely here) general organic matter (Skidmore, 1985).
			Limnophora sp.	UNK	DP; see above.
			Musca autumnalis	NN	CWS.
			Stomoxys calcitrans	NN	* CWS.
		Mycetophilidae	*Leia arsona*	NN	* CWS, generally in damper areas.
		Phoridae	*Megaselia abdita*	UNK	Only record from WS during AS.
			Megaselia curtineura	NN	The only easily identified species of the genus on St Helena. CWS in the PBP area and other nearby arid sites.
			Phoridae indet.	UNK	Species collected during the current survey not referable to *M. curtineura* recorded as Phoridae indet. as precise identification is uncertain.
		Psychodidae	*Psychoda alternata*	NN	* CWS.
			Psychoda surcoufi	NN	CWS.
		Sarcophagidae	*Sarcophaga argyrostoma*	NN	Three specimens in the DP Malaise trap in sample PROS 07. Specimens of this genus are extremely difficult to identify and can only be made from males, where even then it is necessary to dissect the genital capsule. The only specimen of *S. argyrostoma* collected to date was from Varneys during BE1. As the only species reliably reported from PBP before are *S. redux* (AS sites CPW, SA and SP) and *S. exuberans* (BE2), this identification should be regarded as doubtful until confirmed by an expert.
			Sarcophaga exuberans	NN	See *S. argyrostoma*, above.

			Sarcophaga redux	NN	See *S. argyrostoma*, above.
			Sarcophaga sp.	NN	All female specimens of this genus have been recorded as *Sarcophaga* sp. as they can not be reliably identified to species level at present.
		Scatopsidae	*Coboldia fuscipes*	NN	CWS.
		Scenopinidae	*Scenopinus glabrifrons*	NN	CWS.
			Scenopinus sp.	NN	Possible endemic species found during AS. Close to *S. canariensis*; only one specimen certainly referable to this species found in Malaise trap sample 4. Other specimens identified as *S. glabrifrons* from this survey may well belong to this taxon but comparison with the Ashmoles' specimens will be necessary to confirm this, probably by expert researcher.
		Sciaridae	Sciaridae indet.	UNK	* Species of unknown status collected by Malaise trap during this project. Need to be examined by specialist researcher to determine status.
		Sphaeroceridae	Sphaeroceridae indet.	NN	* There are 15 species in this family recorded from St Helena; the only endemic species is confined to the High Central Ridge and is wingless. Identification of the remaining species is extremely difficult and further endemic species *may* be present, though expert researcher analysis will be required.
		Syrphidae	*Eumerus lugens*	ES	* A CWS endemic, more common in less arid areas of the island; ecology unknown.
			Simosyrphus aegyptius		CWS.
			Syritta stigmatica	EGS	CWS.
		Tachinidae	*Atlantomyia nitida*		Originally described from 14 individuals collected on PBP during BE2. Found here again during AS. Found here a third time during PS as well as at the Scrubwood (*Commidendrum rugosum*) site near the Signal House south of King and Queen Rocks. Strangely, at least two others found during PS Mount Actaeon and The Depot. Seven specimens found in May 2017 during DP. Not found during the current survey. While apparently being a PBP specialist endemic, the upland records show that it is probably present across the rest of the island at low density. Most tachinids are parasitoids of caterpillars, although they can also attack beetle larvae and adults.
			Drino quadrizonula	?I	* CWS.
	Siphonaptera	Pulicidae	*Xenopsylla brasiliensis*	NN	* Rat flea. Unusual to find it away from the host species. Single individuals found in UBG pitfall trap during the main survey and in SA pitfall sample 3. Probably CWS on hosts.
	Hymenoptera	Ampulicidae	*Ampulex compressa*		CWS.
		Apidae	*Apis mellifera*	NN	CWS.
		Bethylidae	*Holepyris atlanticus*	ES	Appears to be common in the more arid areas of the island including PBP and Rupert's Valley. Probably a parasitoid of an endemic weevil, possibly *Microxylobius westwoodi* or *Acanthinomerus armatus* due to its distribution and relative commonness.
			Sclerodermus insularis	ES	Described from three females collected on PBP during BE2 on 25/02/1967. Not found since during subsequent surveys or this one. Despite *S. sanctaehelenae* (below) being found relatively commonly during the current survey, it is still likely to be present but may have been missed either spatially or temporally.
			Sclerodermus sanctaehelenae	ES	Described from 8 individuals collected on PBP on 25/02/1967 during BE2; not found by other surveys since. During this project, found during the main survey at UBG, CPW, SBS and SP; SO and SA during temporal sample 2, SA and R3 during temporal sample 3, SO

					and SA during temporal sample 4, and SO and R5 during temporal sample 5. All specimens were collected by Berlese extraction from dead wood and litter samples. Is probably CWS in suitable habitat. The almost cosmopolitan species *S. domesticus* (not present on St Helena) is known as the 'antiquarian's friend' as it is a parasite of woodworm larvae and sometimes caterpillars. As *S. sanctaehelenae* is apparently quite common here it is likely to be a parasite of beetle larvae, most probably weevils or fungus weevils.
		Braconidae	*Aphaereta minuta*	NN	CWS.
			Aphidius colemani	NN	* CWS.
			Cotesia vestalis	NN	CWS.
			?*Braconidae* indet. 1	?EN	* A small, wingless species with a long ovipositor.
			?*Braconidae* indet. 2		* A medium- to large-species with an orange head, black body and yellow posterior to the abdomen.
		Chalcididae	*Chalcis sodalis*	?I	* Only previously known from 10 specimens collected on Horse Point during BE2. One specimen found in the second Malaise trap sample.
		Crabronidae	*Liris haemorrhoidalis*	INNS	The species of the tribe 'Larrini' of AS / AR. A specialist predator on ground crickets that now appears to be present at low density across the island (including records from Shark's Valley and South West Point.
			Pison wollastoni	EN	An arid land specialist found occasionally in and around PBP. Species of this group paralyze spiders and stock 'larders' for them in mud-built cells for their larvae to feed on. Likely to be present at low density across the site.
		Diapriidae	*Trichopria* sp. 6 (Faune Terrestre)	UNK	Eight specimens collected at the base of Fisher's Valley, the High Central Ridge and PBP (1 female) during BBE.
			Diapriidae indet.	UNK	Species very difficult to identify. Two females in the fourth Malaise trap sample, possibly referable to the above species, but precise identification not possible without comparison to the above species by a specialist.
		Encyrtidae	*Acerophagus* sp.	UNK	One specimen collected at SA during AS.
			Anagyrus sp.	UNK	Two specimens from Great Stone Top during BE2 and one female from north-eastern PBP during the northern runway survey (Pryce & Paajanen, 2014). Not found during the current survey.
			Copidosoma koehleri	NN	Biocontrol for Potato tuber moth (*Phthorimaea operculella*) released in 1972. Found in Malaise trap samples 2, 3 and 5. Could potentially have switched host.
			Diversinervus elegans	UNK	Probably CWS.
			Rhopus sp.	UNK	Seems to be confined to PBP area but of unknown status until species identification can be resolved.
		Eupelmidae	*Macroneura swezeyi*	UNK	* Three females found at the base of Fisher's Valley, Lemon Tree Gut and the valley south of Horse Point during BBE. One female found in Malaise trap sample 5.
		Formicidae	*Cardiocondyla emeryi*	INNS	Found at all three temporal survey sites, R1 and R2 during temporal survey, BYD, CBE, SBS, SP, UBG and WS during main survey, *generally* at relatively low density. A particularly small species, possibly being out-competed by other larger, more aggressive ants.
			Hypoponera sp.	UNK	* An enigmatic species previously found near Lot, at Potato Bay and at Flagstaff by the

					Ashmoles in 1994-5. 24 workers found in pitfall traps at UBG during the main survey. Its distribution and unknown status *could* indicate that it is an undescribed endemic species; further research is required.
			Nylanderia bourbonica	INNS	CWS. A single worker found with BugVac at R4.
			Paratrechia longicornis	INNS	CWS. A relatively new ant on the island, first found in 1994. Found at all sites except BYD and SP during the main survey and at all 'random' sites except R3. Very variable in numbers, but R5 pitfall had around 1000 individuals present. A significant INNS arrival that is probably having a marked impact on the ecology of the site, probably out-competing smaller, less aggressive species of ant. Little chance of successful control.
			Pheidole megacephala	INNS	CWS. One worker found at UBG during the main survey and three workers found at R1. Appears to have been more common during AS (found at CBE, CPW, SO and UBG), possibly being out-competed by *P. longicornis*.
			Plagiolepis alluaudi	INNS	CWS. Only two workers found in Malaise trap sample 2.
			Solenopsis globularia	INNS	CWS. First recorded on PBP during AS, found at every site in this and during current survey also, sometimes in high density (up to 750 individuals from pitfall traps). Along with *P. longicornis* this species is probably having a significant impact on the ecology of the site through direct predation of endemic species. Little chance of successful control.
			Tapinoma melanocephalum	INNS	First found on PBP during BE2. Found again by AS and during the North Runway Survey (Pryce & Paajanen, 2014). Only other known site is Little Dry Gut (Pryce, 2013) so appears to be an EAA specialist. During the main survey it was found at relatively low density at SA and WS (12 workers), but high density at SO (>300 workers); it was found regularly at SA and SO during the temporal survey. Appears to be patchily distributed and may be beginning to be out-competed by *P. longicornis* (above).
			Tetramorium caldarium	INNS	One worker found in Malaise trap sample 1. Generally quite a scarce species, possibly being out-competed by *P. longicornis*.
		Ichneumonidae	*Diadegma mollipla*	NN	* CWS. Biocontrol for Diamondback moth; *believed* to tbe the species released on the island for the control of this moth. Two species, '*D. surendrai*' and '*D. roai*' were released on the island in 1970-72 (Simmonds, 1973), the taxonomic status of both of these is uncertain and requires in-depth taxonomic research, preferably using DNA analysis to resolve it.
			Helenanomalon ashmolei	EGS	Rare PBP endemic. Described from two specimens collected during BE2. Not been seen since.
			Helenanomalon bonapartei	EGS	* Originally described as a rare endemic from three specimens from Knollcombes, High Peak and Peak Dale; now known to be CWS in non-native habitat. Seven specimens in DP Malaise trap sample PROS 07; specimens should be double-checked in case they belong to *H. ashmolei* (above). Possibly a parasite of noctuid moths.
			Netelia insulicola	ES	A scare endemic species with a scattered distribution. Found at PBP site SP during AS and in DP Malaise trap (sample PROS 08). Not found during the current survey. Probably a parasite of medium to large caterpillars, most likely noctuids (AS / AR).
		Mymaridae	*Anaphes nitens*	NN	Biocontrol for Eucalyptus snout beetle (*Gonipterus scutellatus*), released in 1958 (Wallace, 1960). More recent records well away from *Eucalyptus* plantations may indicate a switch in host or possible mis-identification.

		Platygastridae	*Platygaster* sp.	UNK	* Many (233) specimens referable to this taxon recovered from the Malaise trap; status uncertain; probably a parasite of scale insects.
		Pteromalidae	*Peromalus ipsea*	ES	* One specimen referable to this species from Malaise trap sample 3. Appears to be present at low density across the island; ecology unknown.
		Signiphoridae	*Chartocerus fimbriae*	UNK	Two specimens collected in a water tray during AS at SA. An almost cosmopolitan hyperparasitoid of scale insects.
		Sphecidae	*Podalonia canescens*	INNS	Caterpillar killer wasp. First found on PBP during AS. Now found across the island, generally in more arid environments. Will be having an impact on larger caterpillars, potentially including those of endemic species. Single individuals seen at BYD, CBE and SO during main survey and SA during temporal sample 4.