

Darwin Plus: Overseas Territories Environment and Climate Fund Annual Report

Important note *To be completed with reference to the Reporting Guidance Notes for Project Leaders:
it is expected that this report will be about 10 pages in length, excluding annexes*

Submission Deadline: 30th April 2019

Darwin Plus Project Information

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| Project reference | DPLUS074 |
| Project title | Improving biosecurity in the SAUKOTs through Pest Risk Assessments |
| Territory(ies) | St Helena, Falkland Islands, UK |
| Lead organisation | CABI |
| Partner institutions | Environment and Natural Resources Directorate (ENRD) of St Helena; Department of Agriculture, Falkland Island Government |
| Grant value | £144,644.00 |
| Start/end date of project | Project Start date: 1/4/2018 Project End date: 31/3/2020 |
| Reporting period (e.g., Apr 2018-Mar 2019) and number (e.g., AR 1,2) | Apr. 2018 – Mar. 2019 |
| Project leader name | Norbert Maczey |
| Project website/blog/Twitter | |
| Report author(s) and date | Norbert Maczey, Pablo Gonzalez-Moreno, Julie Balchin, Naomi Baxter 30/04/2019 |

1. Project overview

The JNCC led South Atlantic Overseas Territories Regional Biosecurity Workshop held in Ascension Island in August 2015 identified the lack of capacity to carry out PRA on new imports such as ornamental plant species as a problem for all SA UKOTs. In addition, a recent gap analysis assessing biosecurity and control of invasive species on the UKOTs conducted by the Non-native Species Secretariat for Great Britain (NNSS) (Key 2017; <http://tinyurl.com/yamf6eyb>) highlighted significant gaps in biosecurity capacity, particularly with regards to prevention within the majority of the UKOTs. At the same time CABI is developing a new horizon scanning tool as part of the open access invasive species compendium (ISC). This project aims to improve biosecurity in the SAUKOTs. Its focus is on developing Pest Risk Assessment (PRA) procedures tailored to the needs of individual territories and on building capacity to use these. These improved procedures will make use of CABI's a new horizon scanning and pathway analysis tool. Specific requirements for improved procedures have already been discussed at a regional workshop and implementation of a draft PRA template will be tested during the second half of the project. The project is split into four work packages:

WP 1: Identifying specific needs of individual OTs

Building on the existing gap analysis a review of specific requirements for the participating territories has been undertaken in form of a workshop on St Helena, including the consultation of a wide range of stakeholders.

WP 2: Test and implement a horizon scanning tool for invasive species

This project uses St Helena and the Falkland Islands as a case study to test and improve a new horizon scanning tool based on pathway analysis currently under development for the CABI compendia.

WP 3: Develop tailored PRA procedures for individual territories

This WP focuses on mechanisms to improve capacity to confidently conduct PRAs in each territory. A PRA form, recently developed for the Falkland Islands (with input provided by St Helena and South Georgia during DPLUS033), together with existing guidelines in the territories provides the background to develop better tailored PRA procedures. The horizon scanning tool from WP2 has become an integral part of these improved procedures. The PRAs templates developed on our project cover these scenarios:

- Accidental introduction of new invasive species (horizon scanning, pathway analysis and rapid response procedures) primarily into the terrestrial but also marine environment;
- Introduction of non-native species as ornamental, pets or for commercial purposes (e.g. aquaculture), including PRA of anything associated with these species such as soil substrate or packaging;
- Introduction of non-native species for biological control of invasives or as pest control agents in agriculture and horticulture.

WP 4: Create a biosecurity network for all SAUKOTs to share knowledge about species of concern, alerts, etc.

We will look into ways to make better use of a network of individual skills available in the territories and how to draw on expertise from other organisations such as FERA or CABI against a background of tight financial limitations. This WP will also address issues such as the periodical loss of skills and experience associated with fluctuation of staff and access to information, when internet access or other forms of communication are limited. We will also assess how such a network can include a repository (or at least access to it) of information and tools and to which degree frequent communication among islands officers is required to allow consistent updates of information and improvement of skills.

Many aspects of the four WPs are covered by desk-based activities, but there was also the need for two workshops (one each year) identified, and the first one was held on St Helena in March 2019. At this workshop training of biosecurity staff took place to conduct PRA using the template developed in the first year of the project. The current focus lies on improving the PRA template based on the experiences gained during the workshop and further mentoring and training.

2. Project stakeholders/partners

Project partners are:

CABI

CABI has led the design and development of this project and provides overall co-ordination. CABI is also responsible for providing the necessary horizon scanning tools, drafting the framework for updated PRAs and conducting all training activities. CABI scientists have considerable experience in conducting research linked to invasion ecology, biodiversity conservation covering taxonomic, ecological and other aspects such as biological control of invasive species and PRAs for the introduction of biological control agents. Norbert Maczey is the project manager and lead scientist, Pablo Gonzalez-Moreno a project scientist with high level experience on PRA development.

Environment and Natural Resources Directorate (ENRD) of St Helena

The Environment and Natural Resources Directorate brings together roles concerned with the management, conservation and regulation of the natural and man-made environment, allowing for a properly co-ordinated and joined-up approach. This includes lands, buildings, transport

infrastructure, agriculture and the environment. During this project ENRD receives training to increase capacity for biosecurity. It will itself be responsible for the community awareness programme to promote any planned changes on biosecurity procedures. The directorate is well placed to carry out this activity through building on a range of other ongoing awareness raising activities.

Department of Agriculture, Falkland Island Government

The Department of Agriculture Biosecurity section leads on biosecurity for Falkland Islands Government, working on the international borders as well as within the archipelago. The department is supported by biosecurity, agricultural and veterinary staff and as such is well placed to partner in this project. During this project the DoA receives training to increase capacity for biosecurity. It will itself be responsible to promote and implement any planned changes on biosecurity procedures.

Other key stakeholders are organisations involved with the biosecurity in the SAUKOTs. As such not only biosecurity officers from St Helena and the Falkland Islands but also from South Georgia, Tristan da Cunha and Ascension Island as well as for the GBNNSS have been involved in the development of the proposal leading to this Darwin project. Only St Helena and the Falkland Island are official partners on this project but the biosecurity teams from the other territories are still included in any project discussion and take regularly part in project meetings (via skype). In addition, further organisations and institutions tasked with the control of invasive species such as the St Helena National Trust and CEH take part in the project as is reflected in the list of attendees of the skype meetings and the workshop held in March 2019 on St Helena (annex 3). The project is very open in sharing the outcomes at any stage of the project as widely as possible and also to encourage all stakeholders to take actively part in project planning and decision making. As a consequence, the e-mail list of people to whom project updates are circulated is constantly growing.

There have not been any particular challenges with stakeholders involved but some technical difficulties in linking up to our meetings via skype have got in the way of making the project even more inclusive.

3. Project Progress

3.1 Progress in carrying out project Activities

(Activities given in italics)

1.1 First audio/video conference with all project partners present; project introduction; discussion of work plan and amendments if necessary; establishment of communication channels/procedures; collation of information on existing PRA procedures and preliminary listing of priority needs and gaps.

The first project video conference was held 3rd of May 2018 using skype. The teams from St Helena, CABI and in addition the team of biosecurity officers from Ascension Island (not a full project partner) took part. Skype connection with the Falkland Islands could not reliably established and the participation of their team had to be abandoned early on. However, notes on the meeting were discussed with Naomi Baxter after the meeting. The first meeting covered the following agenda points (full notes in annex 3a):

Introduction to the project: Main aim of project is to make the process of doing Horizon scanning (HS) and Pest risk assessments (PRA) more user friendly for biosecurity officers in the SAUKOTs using St Helena and the Falkland Islands as case studies. The CABI HS tool (HST) is aimed to provide significant support to users and feedback by users during project to improve HST further. In addition, a new CABI PRA tool is already under development but needs to be tested whether it can fully address the needs of the OTs.

Availability of data/protocols: Ascension has just started to record biosecurity interceptions from November 2017. This includes setting up traps surrounding the base and recording monthly, initially to create baseline data (identification what is already there). In the Falklands interception data goes a while back and PRA protocols are in place for inspection of shipped goods (flights and ships). Due to a previous Darwin project a PRA protocol for the introduction of species for

biological control is also in place. SH has implemented a screening process from plant material in order to decide if a PRA is needed. Information is obtained from different sources including CABI compendia. PRA requests are not frequent so experience and skills can be lost with time. PRA requests come usually from agriculture imports (plant material mostly, particularly plant bulbs). As flight links are now established it is possible that requests for PRA become more frequent in the future. SH has a detailed protocol for biosecurity checking luggage in the airport, cargo, also traps. Data on interceptions is stored locally by the Government.

Tools provided by CABI: A PRA tool prototype should be delivered in December 2019. The HST is now available in a beta version; SH has been trying the HST but limited internet didn't allow full testing. The team prefers to do more testing before giving advice. SH has been using the Crop Protection Compendium (CPC) version of the tool that it is more complete than the Invasive Species Compendium (ISC). CABI is working in filling data gaps from the database, mainly from the ISC in terms of distribution and habitat data. Information on pathways varies considerably between individual datasheets; we discussed also the weighting of pathways and the concept of 'neighbouring' countries in the context of islands. After the meeting interception data from FI, Turks and Caicos and BIOT was exchanged and analysed.

Current communication network: SH: e-mail is the most commonly used form of communication to Ascension and other OTs. There is room for improvement and the project should facilitate any possible improvements. Ascension: Skype talks have been proven to be quite useful for coordination. It was discussed how PRA procedures can be made easier by sharing skills through an improved communication network in the SAUKOTs. However detailed discussions for this have been reserved for the project workshops.

Project communication: Frequency of skype talks: It was decided to have meetings every 10 weeks (2-3 months) with other communication done in between via e-mail. Steering group: Participants of teleconference meetings, not being project partners to act as steering group (Jill Key, Matt Stritch, CABI compendia team)

Next steps and Integration with NNSS horizon scanning activities: Over the weeks/months following the first meeting we will concentrate on generating feedback to improve the HST. It was suggested to use manuals already provided by CABI for the HST for further testing (manuals provided after the meeting). Assessment of any interception data (data base versus observations); assessment of existing PRA form /procedures and how best to use them for integrated workflow. The testing of the HST should already provide suggestions for species suitable to test the PRA tool. We decided that suggested species for PRA assessments should cover a range of species as well as pathway situations (marine invertebrate, invasive weed, ornamental plant etc.). It was also decided that the Darwin project should work more closely with the NNSS/CEH team working on horizon scanning (A meeting with CEH took place and we decided on a much closer collaboration, including incorporating the CEH team into the steering group of the project).

1.2 Circulation of agenda prior to second audio/video meeting. Prioritisation of individual requirements for each OT in more detail.

The second project video conference was held 7th of August 2018 using skype. The teams from St Helena, the Falkland Islands and CABI as well as Jill Key from the NNSS-UK attended the meeting. The team from Ascension Island could not talk part due to technical problems. However, notes on the meeting were forwarded to the Ascension team afterwards. The meeting covered the following agenda points (full notes in annex 3b):

Feedback on the CABI-HST: St Helena: At times there are still problems with slow internet connection. The breakdown of HS into single and simple pathways remains difficult, in particular concerning the countries of origin. In individual ships/planes containers may originate from a wide range of countries and had various stops on the way. Before inspection there is little warning about the origins of containers or other goods even in principle the origin of individual good is clear and declared. On St Helena shipment from South Africa may originate in Australia, NZ or Japan (e.g. vehicles). Diversification of trade routes may have led to diversification of intercepted species. On the other hand, better compliance with introduced measures in particular for fresh produce such as fruits and vegetables may have brought interceptions significantly down.

Equally, in the Falklands direct links are with the UK and Chile but this is not necessary the origin of the shipped goods or containers. A change of pathways (type of ship/shipping) has led to change of interceptions (e.g. now far less spiders intercepted on St Helena). Interception data will show these changes and when linked to changes in procedures will hopefully give insight in future recommendation to reduce biosecurity risks. Interception data exchanged sent after the first meeting was analysed and results discussed during this meeting.

First draft to prioritise species selected through HS for PRA procedures was circulated prior to the meeting and discussed in detail. The selection of the Harlequin Ladybird as a priority species was a good example of the need to improve our first approach to prioritize species. Mainly because it was revealed that indeed there are already control measures in place to deal with outbreaks of this species. There are other factors included in the prioritization, which are difficult to cover reliably (e.g. broad climatic suitability or matching habitats). Discussed the need to not only select species from HS for PRA but also species present but not fully established or species with increasing negative impacts; equally newly emerging threats not covered in databases as yet such as the Southern armyworm. Based on the discussion during the meeting an updated version of the species prioritisation process was developed. A finalised version will however only become available after further testing and the collaborative work on this together with NNSS and CEH who are currently in the process of doing intensive HS for all UKOTs.

The CABI team subsequently participated in the next CEH-led workshops on Horizon Scanning in October (covering the Falkland Islands, SG and BAT), November (covering St Helena, Tristan and Ascension) and January (Gibraltar). During the workshops, the CABI team gave summary presentations of the current Darwin plus project and the CABI-HST. The tool was used by the taxonomic groups to identify a preliminary list to prioritize providing useful feedback for further improvement of the tool. One very important output from these workshops were HS lists with species prioritised by a group of experts for specific taxonomic groups. These lists provide a valuable background to validate any lists created automatically by using the CABI HST and a subsequent automatic prioritisation of species.

2.1 Existing PRA procedures reviewed and draft for improved procedures developed

The timetable for this stretches into the next quarter but progress for this activity is well underway. In detail the CABI team has covered the following individual aspects (for more detail see annex 3c):

- Develop an automated process to condense potentially long lists from the HS into a more manageable ranking of prioritised species for PRAs, without too much input from experts on individual species). This will include attaching values to individual species, by building framework, which can be populated automatically.
- A review of existing prioritization tools/schemes (point systems) for HS/PRA.
- Trialling and testing approaches with data for the project islands (Comparing with interception data; after the second workshop additional interception data recorded on St Helena was exchanged).

These topics along with the outcomes of the CEH-led workshops were discussed during the project meeting on the 27th of November. As the CEH workshop on St Helena demonstrated, the interception data is very helpful to select species for HS and subsequently for PRAs. In this respect the concept of using place holders for specific groups (spiders, ants), which represent specific threats, pathways, and finally prevention measures turned out to be a useful and practical approach. Both workshops discussed and ranked top species in extensive HS scanning exercises, covering terrestrial invertebrates and vertebrates, plants and marine species. This has been of great value for the selection of species for PRAs at the workshop in March 2019.

It is important to note that during the workshops the preferred approach was not to systematically assess every species from long lists derived from an initial HS using the CABI HST. Instead expert discussions were focused on the climatic conditions in the individual OTs, available pathways; prevalence of a fauna/ flora particular susceptible to invasives (rate of endemism; impact of previous introductions etc.) and based on this particular invasive and important species from the areas of origin were individually discussed. Other important factors looked into were whether a species was already present (but had not been reported as such in publicly available

data) and the likelihood of arrival for new invaders. This overall approach avoided the very time-consuming coverage of each individual species from the very long CABI HST lists. In this context, it was again very important to use placeholders for specific taxonomic groups (ants, spiders, mosquitos etc.)

One issue that emerged frequently was that despite intensive inventory on almost all OTs, we often don't know whether some species are already present. This concerns in particular taxa, which are difficult to identify and/or are easily overlooked; e.g. scale insects on St. Helena.

CABI PRA tool is particularly looking into pathway risk assessments and will only cover at a later stage species risk assessments. This also means we can't easily run the top species from the CEH workshop easily species with the PRA tool without some further adjustments. We also have to deal with a number of problems very specific to the OT island systems, e.g. the import of compost bags, which can contain a particular wide range invasive species from various taxonomic groups. This represents an individual pathway and the CABI PRA tool will be able to look into such specific circumstances. A beta version became available at the end of 2018 and links to conduct trials were send out before the workshop in March.

One problem for pathway analysis is the difficulty to obtain up to date information not only on publicly established and widely known traffic routes (shipping; planes) but also on more unofficial traffic (yachts, private planes etc.) (on Ascension now smaller planes come in from Florida via Antigua). There seems to be a rather complex network of traffic channels interconnecting the SAUKOTs.

2.2 Draft template for PRA embedded in overall PRA procedures developed based on template developed during DPLUS033 on the Falkland Islands and circulated to project partners

At the end of the first project year the project team has now trialled and tested a first PRA template and by doing so the biosecurity teams on St Helena and the Falkland Islands have gained better confidence in using the template(s) as part of their biosecurity procedures. The testing and intense discussions about both details of the PRA template(s) and accompanying procedures have also revealed that there is still considerable room for improvement. After detailed discussions the workshop team agreed on a final design and improved version(s) along with a detailed guidance document will be developed in the second half of the project and again tested as planned during the second workshop of the project. Below we provide a summary of the process the team followed jointly during breakout groups and discussions, which have now led to a highly tailored design of not one but a range of PRA templates (for more details see annexes 3d and 3e).

A first draft template was circulated for comments before a skype meeting held on the 25th of February 2019 (see annex 4). It is based on the template from DPLUS033 but was updated to include also all aspects covered by FERA and the GBNNSS in their rapid PRA approaches. This allows a full compatibility with the other PRA templates currently in use. In cases biosecurity staff will not be confident enough with the results of a finalised PRA using the project template this can then forwarded to supporting organisations such as FERA or GBNNSS and upscaled to more detailed versions. First impression on the general setup of the template discussed at the skype meeting were fine, but it was decided to put the template to the test more vigorously during the workshop in March 2019. One important aspect of the first version was that there is a deviation from the CABI online approach (CABI PRA tool using individual pest focused approach still under development) and the project specific word-based format covers more details and a wider range of questions. This is mainly caused by the fact that the word format used in our project also tries to cover a wider range of PRA types not only dealing with accidental introductions but also with species already established in the PRA area and intentional introduction such as commodities, pets or biological control agents.

At the workshop breakout groups tested the draft version intensively during training sessions, using both species high on the CEH list for accidental introduction (e.g. blue mussel) and for planned introductions (e.g. lady palm). After intense discussions the team then agreed on a number of further improvements to tailor the PRA better to the specific needs of St Helena and the Falkland Islands and to achieve a reliable and unambiguous PRA. Most importantly we recognised that different PRA templates will require different procedures and responsibilities will

also differ depending on the purpose of the PRA. It is important that PRA procedures need to cover various types of PRAs including one, which can deal with introduced species already being present in the target area to assess invasiveness, impact and to prioritise control efforts. To allow a more direct approach for this and for other procedures, which will require PRAs, we decided to separate our PRA template into several versions to cover specific purposes:

- PRA for accidental introduction of an invasive species (based on HS).
- PRA for invasive already established or in the process of establishing in the PRA target area
- PRA as part of application for a planned introduction of a crop, commodity or ornamental plant
- PRA as part of a planned introduction of agents for biological control

It is important to point out that all types of PRA are of similar importance. For example, early detection of already introduced species and focus on eradication effort stands side by side with prioritisation of long established invasives for control efforts or with the prevention of new invaders coming in in the first place. We also considered that there is also a certain overlap of conducting a PRA for an individual species with the pathway gap analysis.

Having one template dedicated to specifically address accidental introduction should allow for a much better harmonisation with the CABI PRA tool. It was also discussed that the risk of accidental introduction is partially covered by the pathway action plans under development in all OT in collaboration with the GBNSS. However, this type of PRA will still be necessary when further information in their biology or prevention should be required. It is important to note that both should be done in an as complementary approach as possible. Assessing very detailed background information for a single species can in particular yield additional information to improve and backstop the outcomes from a pathway gap analysis.

Planned introductions requested by private importers should be covered primarily by the importers themselves with some guidance provided by the authorities. An admin fee for importers applying for new species or commodities to be brought in could help to deal to cover the necessary input from biosecurity authorities, which generally will need to review a PRA at certain stages of development.

The whole process can probably be made much more cost and time efficient through the introduction of a very rapid 'stage 1' form, which should include a concise flow chart to answer very few basic questions to eliminate cases, which in all likelihood will never be licensed from the outset or have already be proven to be safe for import, before proceeding to a more detailed PRA. Such a stage 1 pre-application can be reduced to few questions that could be responded by the biosecurity team. A tentative list of questions was discussed during the workshop (provided in annex 3e). Preferably, stage 2 (our current PRA template) will become the responsibility of the importers as biosecurity teams have very limited staff to carry out these extra activities. After the importer submits the PRA the biosecurity team should provide a justified response (PRA declaration) asking for further clarification or more details. In some cases, this declaration might ask for a very detailed PRA (stage 3), which could include more complicated assessments such as modelling to more precisely predict impacts. Again, responsibility would lie in principle with importers but outsourcing to approved institutions (FERA, CABI, free-lance experts) on a consultancy basis could be possible. Finally, public consultation should be incorporated in the approval process, possibly after stage 2, in order to get the feedback of the relevant stakeholders.

One aspect that still needs to be resolved in the months ahead is the aspects how to deal best with a plethora of species associated with commodities, ornamentals or crops planned for introduction, which could then be accidentally imported. We will explore methods to filter, cluster or group such species to avoid the necessity to conduct individual PRAs for each of them. We will also check, how the UK authorities and other countries are currently dealing with this problem. There is also the opportunity to rank these species according to the CABI prioritisation tool currently under development. One possible approach could include changing the sequence of questions within the template. By grouping associated species according to pathways and/or preventative measures only representative for these pathways and measure may need to be assessed in more detail regardless of their individual impacts. In this respect the focus will have to be primarily on prevention at pre-border (using only certified nurseries; allowing only plants in with a

phytosanitary certificate, plants which are bare rooted, sprayed with insecticide and fungicide; in some cases, perhaps in vitro culture is the only way forward to allow save imports). With regards to assess associated species one important aspect we discussed was that it is important to assess how observable/detectable individual associated species are at border control.

At the core of any PRA looking into associated species should always be the question: 'Can the risk of accidental introduction of associated species be reduced any further?' One very important aspect relating how biosecurity officers can be confident enough to be satisfied with PRA conducted by themselves or the approval of draft PRA from somebody else is to be aware that no PRA can ever be perfect, and that officers need to be aware that they only need to fulfil due diligence to lower risks as much as possible but also to accept that these risks in most cases are never reaching zero. PRAs should be seen in the first instance as a helpful tool to improve biosecurity from any given status quo but are not designed to eliminate any risks completely. Often PRA might only be done by biosecurity officers to help them with decision making on additional measures or the prioritisation of existing efforts and it may not always be necessary to go public with a draft PRA if confidence levels are low. In addition, any reviewing of draft PRAs from outside (e.g. the GBNNSS), at least in the initial phase of establishing PRA procedures, would vastly help to assert confidence within the local biosecurity teams.

3.1 Mechanism developed to integrate horizon scanning tool into PRA procedures of participating OTs

The CABI horizon scanning tool (HST) developed through matched funding has now become fully functionable and is open accessible (<https://www.cabi.org/HorizonScanningTool>). During the workshop we tested the HST in two breakout groups by creating HS species lists for a range of pathways, covering both St Helena and the Falklands. We also aimed to compare our results with the HS lists from the previous CEH/GB NNSS workshops held in 2018. Whilst this improved confidence of the involved teams conducting their own HS our trials came up with a number of comments and suggestions for improvement and a better tailoring of the HST for the needs of OTs. A full list of the suggestions for improvement and other comments are provided in the workshop notes attached in annex 3e.

One important aspect to link HS to PRAs is the prioritisation of species from lists gained through the initial steps of HS. The aim is to reduce the number of species for which the conduct of a PRA is recommendable. We specifically assessed HS lists for St Helena using pathways via planes and boats from South Africa and Namibia. CABI has looked in a wide range of parameters accessible, which could allow a ranking of specie for PRAs. Unfortunately, parameters such the number of countries invaded by a particular species do not seem to directly correlate to likelihood of introduction, establishment of expected impact. However, correlation with these factors is higher with regards to number of citations in CAB abstracts. There was only a partial overlap with priority species selected during an expert workshop held on St Helena in Nov. 2018, which was using also the same HS lists plus some additional species. In order to achieve a better matching between automated lists and expert list we will need to assess parameters in more detail (incl. weighing) and separate list according to major taxonomic groups (invertebrates, vertebrates, plants, marine species etc.) similar to the expert approach during the workshop in November 2018. Equally, we will have to adjust to the place holder approach adopted for expert lists (see previous meeting notes). These will be the next steps to be covered in the second half of the project to better link HS with PRA procedures. It became clear that probably the most useful application for this tool is in planned introductions of specific crops or ornamentals in order to filter/group/cluster their associated pests and diseases. Such large list of species shows often as part of a PRA for a crop or an ornamental plant within the wider the application process for planned introductions and would consequently require all individually their own time consuming and costly PRAs if no other way can be found to deal with them. Several recommendations in terms of indicators were made:

- CABabstract records might vary with time depending on when researchers are interested in certain species. Thus, this might not be always a good indicator to prioritise species.
- When calculation the matching climate indicators it will be interesting to separate records invasive from not invasive in order to give higher relevance to those areas where the species is invasive.

- On top of the automatic prioritisation, local knowledge will be always required to evaluate the validity of the ranking proposed by the indicators.

One important outcome of preliminary trial revealed a high prevalence of plant diseases within the species ranking highest. These are almost absent from expert lists of previous workshops (no specific expert group on pathogens taking part) but should certainly be considered to a higher degree in future PRA coverage. Another aspect, which could be covered in the future is to validate predictions of expert lists and automated lists against recorded new arrivals on St Helena (or other OTs) in a few/10 years' time) to test which approach matched conditions on the ground best.

During a breakout session two teams selected six top species for PRAs in St Helena. As a background one team used the list compiled by experts during the CEH/GBNNS workshops in 2018 while the other team used an automatically prioritised list from the CABI HST based on the main pathways identified by the biosecurity team. Details of the selected species and the reason for their selection are provided in the workshop notes (annex 3e).

3.2 Progress towards project Outputs

Output 1: Existing PRA procedures reviewed and specific need for improvement in individual participating OTs identified

This was the starting point of the project and covered in all skype meetings and during the first project workshop held in March 2019. Details are provided within the attached notes of all skype meetings and the workshop. Whilst both on St Helena and the Falkland Islands high levels of biosecurity procedures are already in place specific templates to conduct PRAs had either been not available or at least not tailored enough to cover the needs of individual OTs. On the Falklands the template from DPLUS033 has been in use but as discussed above there had been room for much improvement. Equally, the existing procedures on St Helena are in need to be updated to better deal with new emerging threats and new pathways. The identification of existing gaps and needs on both OTs have been the bases for the development of a newly designed PRA template linked to an easily accessible online HS tool.

Output 2: Template for PRA developed and implemented into PRA procedures.

As described in detail under activities a template for PRAs has been developed and through training of biosecurity staff made available for immediate use within the existing biosecurity procedures (annex 4). However, there is still room for improvement as discussed with all stakeholders during the workshop last month and changes towards a final design are currently underway.

Output 3: Use of CABI horizon scanning tool integrated into PRA procedures

Already early on (before the first meeting in May 2018) biosecurity staff from all SAUKOTs taking part in the project had the opportunity to trial and test the CABI HST. The tool was also very useful in providing background lists for the HS exercised during the CEH-lead expert workshops covering all OTs. By providing training to biosecurity staff from St Helena and the Falkland Islands and feeding back recommendations for further improvements of the tool has become readily available as part of the existing PRA procedures on both OTs. Initial prioritisation of species from HS for PRA has been covered through the CEH led workshops. However, we hope that future updates can make use through a more automated prioritization process provided by CABI. This has been tested but a finalised version will only become available in the second half of the project. It needs to be pointed out that the development of a prioritisation tool is not part of the project as such but, in case it will be successful, will be an additional achievement of the project.

Output 4: Biosecurity staff trained and confident in following PRA procedures

This output has not been scheduled for first project year but intensive training has already been provided during the run-up to and during the workshop. Training will be continued in the coming months and in particular assisted testing of the finalised versions of the PRA templates are scheduled for the coming months.

Output 5: Network between biosecurity personnel of participating OTs established in order to pool individual expertise and make conduct of PRAs more reliable

This output has also not been scheduled for first project year, but one session during the workshop was dedicated to this issue, which was also already discussed during some of the

skype meetings. More details are provided in the attached notes for the workshop (annex 3e). Team discussions on this topic have already resulted in the instigation of an e-mail exchange list between the biosecurity officers of the SAUKOTs and a much tighter cooperation and exchange of knowledge and skills between the biosecurity teams from St Helena and the Falkland Islands. Furthermore, the workshop in St Helena in March, provided an excellent opportunity for the close cooperation between the biosecurity teams of both territories, including visits to the biosecurity facilities and direct involvement in their daily activities (i.e. vehicles, flight and cruise ship inspection).

3.3 Progress towards the project Outcome

Outcome: *Biosecurity on several SAUKOTS improved through the implementation of better PRA procedures; Biosecurity staff confident in independently conducting PRAs. Improved prevention of the introduction of invasive species*

Indicators:

- *Increase of rejections of high-risk species and higher acceptance of the import of low risk species over a five-year period after termination of project compared to level before*
- *Increased interception of some high-risk species due to raised alert after horizon scanning*

As described in the activities and output sections the project is - in our opinion - well on track to fully achieve the outcome. The availability of the CABI HS tool (<https://www.cabi.org/HorizonScanningTool>) and of a first version of a PRA template (currently no open access of beta-version) contribute already to improved PRA procedures. Both tools have been developed through matched funding to this project. Although still ongoing biosecurity staff have already received some training improving confidence levels to independently conduct HS and PRAs. The availability of staff time, which can be dedicated to the conduct of PRAs, has been identified as a possible limiting factor in the future to fully endorse the newly available tool. We are, however, confident that by the end of the project the structures are in place to deal with newly emerging threats from invasive species in a much-improved way.

The indicators to measure achievement are still adequate, but will only be able to do so long term and after the termination of the project.

3.4 Monitoring of assumptions

Assumption outcome: Rate of inspections and applications remain on same level

This assumption still holds true.

Assumption Output 1: Need for improvement exists on all participating OTs

This assumption still holds true.

Assumption Output 2: No assumption given for Output 2.

Assumption output 3: Online access allows full access to tool and compendia information

This assumption still holds true.

Assumption output 4: No fluctuation of staff during duration of project

This assumption still holds true.

Assumption output 5: Procedures in place to pass on communication protocol and introduction into PRA procedures in case of changing staff

This assumption still holds true.

3.5 Project support to environmental and/or climate outcomes in the UKOTs

The project supports the future proofing of the involved OTs against increased risks of the introduction, establishment and spread of alien invasive species. In all SAUKOTs this is particularly relevant in connection to increased traffic and tourism and in the OTs with more temperate or sub-antarctic climate these risks are expected to become greater with climate change. Climate change is likely to allow the establishment of species in areas currently too cold

for their long-term survival. Staff training and the availability of new (online)tools contribute to address these increased risks.

4. Monitoring and evaluation

Regular project monitoring has so far been conducted through meetings and briefings via audio/video links, including the monitoring of progress against project outputs. This will be continued by CABI and project partners throughout the project. The achievement of milestones has been regularly checked against the Implementation Timetable during the skype meetings. Part of the monitoring is also the Darwin Plus reporting (six-monthly progress reports and this annual project report). The reports, as well as all published outputs, are generated as collaborative activities, with responsibility shared equally between the project teams on the OTs and the UK. All project data has been made available for evaluation at the workshop, during which the plan for the subsequent phase has been developed (see workshop notes annex 3e). Progress achieved to date has also been reviewed during the workshop. This project is largely desk-based but the activities conducted within individual work packages are expected to impact to a considerable degree on the conduct of subsequent work packages both with regards to the anticipated time frame or applied methodology. However, as the four work packages of the project need to be conducted sequentially to a certain degree, towards the end of each package a limited evaluation to agree necessary adjustments is always undertaken. At these points in the project consultation with involved stakeholders we evaluate ongoing activities and modify procedures whenever required. By the end of the project, the team will evaluate whether biosecurity personnel are designing and implementing their own PRAs, and whether a network to increase the pool of skills between individual OTs is an accepted management method in the study area. This will be evidenced by work reports and whether PRAs and biological control have been included in forward work planning beyond the life of this current project. However, the long-term development of PRA procedures for the prevention of the introduction of IAS, and the subsequent more sustainable control of individual IAS already established, will only become apparent after completion of the project and cannot be assessed as part of this project. CABI uses the PRINCE2™ project management methodology to manage and implement all its projects, ensuring that communication is maintained between collaborators, and with the project's sponsors through the use of structured reporting and clear communication channels. CABI has retained overall financial control over the project, and all partners account specifically for funds provided to them. The final project report and any publications based on the results of this project will be peer reviewed, internally by senior scientists in CABI, internally within the DI (if required) and externally before submission.

5. Lessons learnt

Overall, the project team worked extremely well together, despite some technical communication problems caused of the extreme geographical distances between individual project partners.

The intensive collaboration with research teams from other projects working on similar subjects (CABI compendia team developing USDA funded online tools for HS and PRA, CEH/GBNNS conducting HS expert workshops, DI funding in parallel the implementation of an invasive species strategy on St Helena) led to very useful synergistic outcomes and improvements of the individual projects.

As expected direct discussions held during the workshop turned out to be much more productive compared to skype meeting with there often disrupted connections and/or poor acoustic quality.

6. Actions taken in response to previous reviews (if applicable)

n.a.

7. Other comments on progress not covered elsewhere

The following publication within the scope of this project on risk assessment methods for invasive species was published:

González-Moreno P, Lazzaro L, Vilà M, Preda C, Adriaens T, Bacher S, Brundu G, Copp GH, Essl F, García-Berthou E, Katsanevakis S, Moen TL, Lucy FE, Nentwig W, Roy HE, Srébaliené G, Talgø V, Vanderhoeven S, Andjelković A, Arbačiauskas K, Auger-Rozenberg M-A, Bae M-J, Bariche M, Boets P, Boieiro M, Borges PA, Canning-Clode J, Cardigos F, Chartosia N, Cottier-Cook EJ, Crocetta F, D'hondt B, Foggi B, Follak S, Gallardo B, Gammelmo Ø, Giakoumi S, Giuliani C, Fried G, Jelaska LŠ, Jeschke JM, Jover M, Juárez-Escario A, Kalogirou S, Kočić A, Kytinou E, Laverty C, Lozano V, Maceda-Veiga A, Marchante E, Marchante H, Martinou AF, Meyer S, Minchin D, Montero-Castaño A, Morais MC, Morales-Rodriguez C, Muhthassim N, Nagy ZÁ, Ogris N, Onen H, Pergl J, Puntila R, Rabitsch W, Ramburn TT, Rego C, Reichenbach F, Romeralo C, Saul W-C, Schrader G, Sheehan R, Simonović P, Skolka M, Soares AO, Sundheim L, Tarkan AS, Tomov R, Tricarico E, Tsiamis K, Uludağ A, Valkenburg J van, Verreycken H, Vettraino AM, Vilar L, Wiig Ø, Witzell J, Zanetta A, Kenis M (2019) Consistency of impact assessment protocols for non-native species. *NeoBiota* 44: 1–25. <https://doi.org/10.3897/neobiota.44.31650> .

The publication was covered in the following media:

- <https://www.brightsurf.com/news/article/040119479824/cabi-led-study-recommends-improvements-to-how-impacts-of-non-native-species-are-assessed.html>
- <https://bioengineer.org/cabi-led-study-recommends-improvements-to-how-impacts-of-non-native-species-are-assessed/>
- https://www.eurekalert.org/pub_releases/2019-04/c-csr040119.php
- <http://humanitariannews.org/20190401/cabi-led-study-recommends-improvements-how-impacts-non-native-species-are-assessed>
- <https://phys.org/news/2019-04-impacts-non-native-species.html>

8. Sustainability and legacy

The project contributes to justify the importance of and raise awareness for biosecurity and the need for further improvement within the public on the involved OTs but also within the wider research community. The profile of the project has been significantly raised through the inclusion of biosecurity staff from OTs not directly involved in the project and of researches working on similar themed projects.

One output of the project will be a set of completed PRAs for species, which may be introduced either deliberately or – using horizon scanning - by accidental introduction. Training, in combination with improved access to information resources using a local network of skills, will also ensure that these can be kept up-to-date according to emerging threats and remain in long-term use. Increased capacity to confidently and independently conduct any required new PRAs will lead to improved biosecurity practices and higher levels of prevention. Through their CABI membership, the participating OTs will continue to have free access to the newly developed horizon scanning tool. The capacity to independently conduct PRAs on potential biocontrol agents to control priority IASs will provide sufficient background information to initiate CBC programmes as required and when funding becomes available. These will themselves promote the development of proposals for control programmes by outlining environmental and economic long-term benefits. Well-integrated PRA procedures will improve the overall chance for implementation of CBC programmes, which will be completely self-sustaining when successfully implemented. Enhanced understanding of the role of CBC and PRA and for the control of IAS by the wider public will itself facilitate and promote the integrated management of invasive species.

9. Darwin identity

The Darwin logo was represented on slides in every presentation given during the workshop. The workshop itself was presented during two radio interviews given for both radio stations present on St Helena in March 2019. During these interviews the aim and purpose of the overall project was also explained and the Darwin Initiative as the main funder specifically mentioned.

All project activities were always presented as a distinct project with a single identity.

We contacted Darwin before the first project workshop to check for the availability of any merchandise or other available items displaying the Darwin logo, which we could use to raise the profile of the DI during the team's stay on St Helena but nothing was available at the time.

The project was also acknowledged in the publication cited in chapter 7.



Figure 1: Radio interview given by part of the project team at SAMS during the March 2019 workshop.



Figure 2: A breakout group at work during the March 2019 workshop in Jamestown, St Helena.



Figure 2: A presentation given during the March 2019 workshop, showing the Darwin Initiative logo.

10. Project Expenditure

Table 1: Project expenditure during the reporting period (1 April 2018 – 31 March 2019)

| Project spend (indicative) in this financial year | 2018/19 D+ Grant (£) | 2018/19 Total actual D+ Costs (£) | Variance % | Comments (please explain significant variances) |
|---|----------------------|-----------------------------------|------------|---|
| Staff costs | | | | |
| Consultancy costs | | | | |
| Overhead Costs | | | | |
| Travel and subsistence | | | | |
| Operating Costs | | | | |
| Capital items | | | | |
| Others (Please specify) | | | | |
| TOTAL | | | | |

The project is underspend by 13% during its first year. The reasons for this are significant savings made for travel of attendees to and from the workshop on St Helena in March 2019. In particular significant discounts were offered for hotel rooms in Jamestown and Johannesburg. Airfares also turned be out to be cheaper than originally anticipated. Operating costs we kept lower than expected because no hiring of facilities to hold the workshop was necessary. In addition, increased in-kind contribution towards staff time cover by the Government of St Helena led to an underspend in staff time costs. A huge proportion of last year's costs both for staff time and direct costs only occurred during the last three weeks of the financial year 2018/2019 when the project workshop took place on St Helena and when the cost savings were achieved. Therefore, it was not possible to predict the underspend any time earlier.

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2018-2019 – if appropriate

| Project summary | Measurable Indicators | Progress and Achievements April 2018 - March 2019 | Actions required/planned for next period |
|---|--|---|--|
| <p>Impact</p> <p>Due to improved biosecurity the rate of invasion by alien species will be reduced. Long term this will reduce staff time and costs required for the control of invasive species.</p> | | <p>The foundations for the targeted impact have been laid according to the project plan. However, the impact itself will only become measurable long term after the termination of the project</p> | |
| <p>Outcome</p> <p>Biosecurity on several SAUKOTS improved through the implementation of better PRA procedures; Biosecurity staff confident in independently conducting PRAs. Improved prevention of the introduction of invasive species</p> | <ul style="list-style-type: none"> • Increase of rejections of high-risk species and higher acceptance of the import of low risk species over a five year period after termination of project compared to level before • Increased interception of some high-risk species due to raised alert after horizon scanning | <p>The project is well on track to fully achieve the outcome. The availability of the CABI HS tool and of a first version of a PRA template contribute already to improved PRA procedures. Although still ongoing biosecurity staff have already received some training improving confidence levels to independently conduct HS and PRAs. The availability of staff time, which can be dedicated to the conduct of PRAs, has been identified as a possible limiting factor in the future to fully endorse the newly available tool. We are, however, confident that by the end of the project the structures are in place to deal with newly emerging threats from invasive species in a much-improved way.</p> <p>The indicators to measure achievement are still adequate, but will only be able to do so long term and after the termination of the project.</p> | <p>Continued staff training; finalised versions of PRA templates to undergo further testing; all according to plan</p> |
| <p>Output 1. Existing PRA procedures reviewed and specific need for</p> | <p>Based on existing GAP analysis by NNSS, specific needs are identified during first meeting of participants.</p> | <p>This was the starting point of the project and covered in all skype meetings and in particular during the first project workshop held in March 2019. Details are provided within the attached notes of all skype meetings and the workshop. Whilst both on St Helena and the Falkland Islands high levels of biosecurity</p> | |

| Project summary | Measurable Indicators | Progress and Achievements April 2018 - March 2019 | Actions required/planned for next period |
|---|---|---|--|
| improvement in individual participating OTs identified | Requirements are listed in order of priority. | procedures are already in place specific templates to conduct PRAs are either not in place or at least not tailored enough to covered the needs of the individual OTs. On the Falklands the template from DPLUS033 has been in use but as discussed above there had been room for much improvement. Equally the existing procedures on St Helena are in need to be updated to better deal with new emerging threats and new pathways. The identification of existing gaps and needs on both OTs have been the bases for the development of a newly designed PRA template linked to an easily accessible online HS tool. | |
| Activity 1.1 First audio/video conference with all project partners present; project introduction; discussion of work plan and amendments if necessary; establishment of communication channels/procedures; collation of information on existing PRA procedures and preliminary listing of priority needs and gaps. | | completed | |
| Activity 1.2, Circulation of agenda prior to second audio/video meeting. Priorisation of individual requirements for each OT in more detail. | | completed | |
| Output 2. Template for PRA developed and implemented into PRA procedures | Template developed by end of first project year | As described in detail under activities a template for PRAs has been developed and through training of biosecurity staff made available for immediate use within the existing biosecurity procedures. However, there is still room for improvement as discussed with all stakeholders during the workshop last month and changes towards a final design are currently underway. | |
| Activity 2.1. Existing PRA procedures reviewed and draft for improved procedures developed | | completed | |
| Activity 2.2. Draft template for PRA embedded in overall PRA procedures developed (tailored version for each territory) based on template developed during DPLUS033 on the Falkland Islands and circulated to project partners | | completed | The discussion and improvement for the PRA template was only scheduled for Q1 of year 2. This has however, already been done during the workshop and final amendments are planned as scheduled for the coming months |

| Project summary | Measurable Indicators | Progress and Achievements April 2018 - March 2019 | Actions required/planned for next period |
|--|---|--|--|
| <p>Output 3. Use of CABI horizon scanning tool integrated into PRA procedures.</p> | <p>Instructions for use of horizon scanning tool developed by end of year one</p> | <p>Biosecurity staff from all SAUKOTs had the opportunity to trial and test the CABI HST. The tool has also provided background lists for HS exercised during the CEH-lead expert workshops covering all OTs. By providing training to biosecurity staff from St Helena and the Falkland Islands and feeding back recommendations for further improvements of the tool has become readily available as part of the existing PRA procedures on both OTS. Initial prioritisation of species from HS for PRA has been covered through the CEH led workshops. However, we hope that future updates can make use through a more automated prioritization process provided by CABI. This has been tested but a finalised version will only become available in the second half of the project. It needs to be pointed out that the development of a prioritisation tool is not part of the project as such but, in case it will be successful, will be an additional achievement of the project.</p> | |
| <p>Activity 3.1. Mechanism developed to integrate horizon scanning tool into PRA procedures of participating Ots</p> | | <p>completed</p> | <p>The discussion and improvement for the HST was only scheduled for Q1 of year 2. This has however, already been done during the workshop and final amendments are planned as scheduled for the coming months</p> |

Annex 2: Project's full current logframe as presented in the application form (unless changes have been agreed) - if appropriate

N.B. if your application's logframe is presented in a different format in your application, please transpose into the below template. Please feel free to contact Darwin-Projects@ltsi.co.uk if you have any questions regarding this.

| Project summary | Measurable Indicators | Means of verification | Important Assumptions |
|--|--|--|--|
| Impact: Due to improved biosecurity the rate of invasion by alien species will be reduced. Long term this will reduce staff time and costs required for the control of invasive species. | | | |
| Outcome Biosecurity on several SAUKOTS improved through the implementation of better PRA procedures; Biosecurity staff confident in independently conducting PRAs. Improved prevention of the introduction of invasive species | <ul style="list-style-type: none"> Increase of rejections of high risk species and higher acceptance of the import of low risk species over a five year period after termination of project compared to level before Increased interception of some high risk species due to raised alert after horizon scanning | | |
| Output 1. Existing PRA procedures reviewed and specific need for improvement in individual participating OTs identified | Based on existing GAP analysis by NNSS, specific needs are identified during first meeting of participants. Requirements are listed in order of priority. | 1.1 Assessment of current PRA procedures reported and priority needs listed in annual project report | Need for improvement exists on all participating OTs |
| Output 2. Template for PRA developed and implemented into PRA procedures | Template developed by end of first project year | 2.1 Template available as word document | |
| Output 3. Use of CABI horizon scanning tool integrated into PRA procedures. | Instructions for use of horizon scanning tool developed by end of year one | 3.1 Instructions available as word document 3.2 Risk assessments available as annex to project report | Online access allows full access to tool and compendia information |
| Output 4. Biosecurity staff trained and confident in following PRA procedures | 4.1 At least 2 staff from each participating territory trained in implementing PRA procedures | 4.1 Training material and documentation of workshop made available in project reports | No fluctuation of staff during duration of project |

| Project summary | Measurable Indicators | Means of verification | Important Assumptions |
|--|--|---|--|
| Output 5. Network between biosecurity personnel of participating OTs established in order to pool individual expertise and make conduct of PRAs more reliable | 5.1 Effective communication channels between trained staff established by end of project | 5.1 Protocol available as annex of final report | Procedures in place to pass on communication protocol and introduction into PRA procedures in case of changing staff |
| <p>Activities (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)</p> <p>1.1 First audio/video conference with all project partners present; project introduction; discussion of work plan and amendments if necessary; establishment of communication channels/procedures; collation of information on existing PRA procedures and preliminary listing of priority needs and gaps.</p> <p>1.2 Circulation of agenda prior to second audio/video meeting. Prioritisation of individual requirements for each OT in more detail.</p> <p>1.3 Final document with requirements in prioritised order circulated and agreed on</p> <p>2.1 Existing PRA procedures reviewed and draft for improved procedures developed</p> <p>2.2 Draft template for PRA embedded in overall PRA procedures developed (tailored version for each territory) based on template developed during DPLUS033 on the Falkland Islands and circulated to project partners</p> <p>2.3 Discussion and amendment of PRA template and PRA procedures at Workshop on St Helena based on results from output 1</p> <p>3.1 Mechanism developed to integrate horizon scanning tool into PRA procedures of participating OTs</p> <p>3.2 Horizon scanning tool explained and jointly tested during workshop on St Helena</p> <p>4.1 Training to conduct PRAs during workshop on St Helena</p> <p>4.2 Selection of case study PRAs for each territory to be conducted by trained staff and followed up on these after workshop</p> <p>4.3 Review of training capacity during second workshop in Stanley or St Helena</p> <p>5.1 Assessment of requirements for establishing network during first workshop on St Helena</p> <p>5.2 Development of draft procedures/protocols for networking activities and skill sharing</p> <p>5.3 Agreement on final approach during second workshop in Stanley or St Helena</p> | | | |

Annex 3 Onwards – supplementary material (optional but encouraged as evidence of project achievement)

Checklist for submission

| | Check |
|---|-------|
| Is the report less than 10MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line. | |
| Is your report more than 10MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line. | |
| Have you included means of verification? You need not submit every project document, but the main outputs and a selection of the others would strengthen the report. | |
| Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic. | |
| Have you involved your partners in preparation of the report and named the main contributors | |
| Have you completed the Project Expenditure table fully? | |
| Do not include claim forms or other communications with this report. | |