



Department  
for Environment  
Food & Rural Affairs



Foreign &  
Commonwealth  
Office



**Darwin Plus:  
Overseas Territories Environment and Climate Fund  
Final Report**

*To be completed with reference to the “Writing a Darwin Report” guidance: (<http://www.darwininitiative.org.uk/resources-for-projects/reporting-forms>). It is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)*

**Darwin Project Information**

Project reference	DPLUS056
Project title	Assessment of current and future Invasive Alien Species in Cyprus
Territory(ies)	SBAAs of Cyprus – Akrotiri, Episkopi and Dhekelia
Contract holder institution	Centre for Ecology and Hydrology
Partner institutions	Joint Services Health Unit University of Cyprus
Grant value	£274,966
Start/end date of project	April 2017 – March 2019
Reporting period (e.g., Apr 2017-Mar 2018) and number (e.g., AR 1,2)	Final Report
Project leader name(s)	Helen E. Roy and Jodey M. Peyton
Project website/blog/Twitter	<a href="http://www.ris-ky.eu">www.ris-ky.eu</a> Researching Invasive Species of Kýpros @RiskýAliens <a href="https://www.facebook.com/groups/riskycyprus">https://www.facebook.com/groups/riskycyprus</a>
Report author(s) and date	Jodey M. Peyton, Oliver L. Pescott, Kelly Martinou, James Fawcett, Monica Demetriou, Yianna Samuel-Rhoads, J. Owen Mountford, Ian J. Winfield and Helen E. Roy. 30th June 2019

## 1 Project Overview

Our project, Researching Invasive Species of Kýpros or “RIS-Ký” (Darwin Plus056), aimed to monitor the current occurrence of invasive alien species (IAS) and predict the potential future threat from IAS on the Sovereign Base Areas (SBAs) of Cyprus. Cyprus is a large island in the Levant region of the Mediterranean. The areas studied as part of this study were the SBAs of Akrotiri, Episkopi and Dhekelia (Fig. 1).



Figure 1. Location of Sovereign Base Areas (SBAs). Episkopi, Akrotiri (both arrow 1) and Dhekelia (arrow 2) studied as part of the RIS-Ky project. © Google maps.

The introduction and spread of IAS represents a major threat to native species and human health around the world. Therefore, the UKOT biodiversity strategy prioritises: (i) *obtaining data on the location and status of biodiversity interests and the human activities affecting biodiversity to inform the preparation of policies and management plans (including baseline survey and subsequent monitoring)*; addressed through work package 2 (ii) *preventing the establishment of IAS, and eradicating or controlling species ... already ... established* addressed through work package 1 and 3. These are also priorities for the SBA Administration (SBAA) in Cyprus and, through surveillance and improved biosecurity, this project addressed these needs through three work packages (Fig. 2).

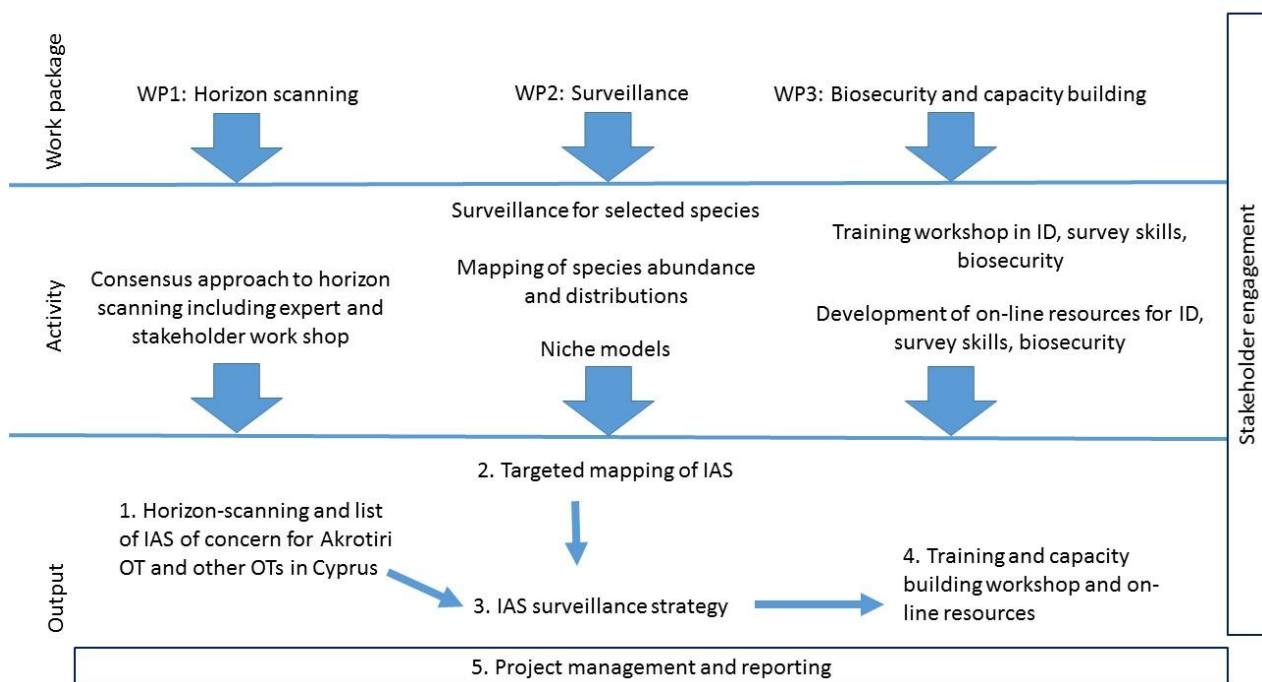


Figure 2. Outline of work package delivery for project.

The horizon scanning aspect of the work (WP1) predicted future IAS threats and worked closely with Cypriot stakeholders, including governmental departments and non-governmental organisations (NGOs). Survey work (WP2) investigated the distribution, establishment and spread of IAS within the OTs studied. Biosecurity and capacity building (WP3) focusing on knowledge dissemination, support and training. For more detail on our achievements in these areas, see section 3 below, and the updated the project logframe (Annex 2). Here we provide a brief overview of the outcomes from each WP.

### **WP1: Horizon Scanning**

We used a consensus method to evaluate the likelihood of species arrivals and impacts based on that of Roy *et al.* (2014), involving experts from Cyprus and several European countries, and taking into account work at European and local scales (Roy 2015). The outcome is a prioritised list of species with the potential to arrive, establish and threaten biodiversity within the next ten years (Peyton *et al.* 2019). This WP therefore aimed to help direct resources in the mission to stop future harmful species arriving and establishing in Cyprus.

### **WP2: Surveillance**

Surveillance has been achieved through field surveys of native and invasive alien species in aquatic and terrestrial environments selected following a scoping study (Peyton and Mountford 2015), and using evidence collected from WP1 and in consultation with the Joint Services Health Unit (JSHU), Akrotiri Environmental Education Centre (AEEC), the University of Cyprus (UCY) and other stakeholders. Our surveillance focused on providing evidence to support the management of existing and emerging IAS. The distribution of the selected IAS were mapped using robust and repeatable methods designed specifically for the project (see Annex 6, Supplementary Material (SM) 1) for details of survey methods undertaken). Surveys were undertaken on the SBAs for plants (Akrotiri, Episkopi and Dhekelia), marine species (Akrotiri and Dhekelia), freshwater fish (Akrotiri), pollinators and mosquitoes (Akrotiri). Thus WP2 was designed to provide a step change in the amount of biodiversity data available to managers and conservationists with responsibility for managing the [internationally](#) valuable habitats of the SBAs.

### **WP3: Biosecurity and capacity building**

WP3 was developed to meet the challenge posed by existing and future IAS through capacity building and improving biosecurity. This focused on training and outreach (including a BioBlitz co-organised with the EU COST Action CA17122) to help promote the ongoing monitoring of habitats that were deemed sensitive to the selected IAS from WP1 and 2. Linked to this, the project provided biosecurity training and has created a biosecurity leaflet that can be shared through the AEEC as a resource for citizens to better understand how they can act to reduce mosquito (including future IAS) breeding habitat. The project has also created resources for the civilian and military residents of the SBA regarding IAS, increasing the chances that new species and populations are more rapidly spotted and managed. The project had enabled support for both institutional and military surveillance for IAS by providing new monitoring and surveillance equipment, through a workshop specifically focused on understanding the potential for increased citizen science activities, and through new collaborations between CEH, JSHU, the SBAs and several Departments of the Republic of Cyprus.

## **2 Project Stakeholders/Partners**

Staff from the Ministry of Defence and SBAA, Chief Officer & Deputy Administrator (Deputy Governor) of the SBA at the time, Dr Philip Rushbrook and Republic of Cyprus government attended the first workshop of the project (April 2017). We were keen to invite all stakeholders from the start of the project. Throughout the project, we have continued to work closely with staff at the AEEC, several departments of the Republic of Cyprus government, and the SBAA, enabling ongoing feedback and project steer.

Specifically we have engaged stakeholders in the following ways:

- by running three well-attended workshops involving academics, government representatives, citizen scientists and educators from throughout Cyprus and the Levant (see section 3 and Annexes 2 and 6 (SM2) below);
- by producing and promoting our work in the local area through the design and production of several species identification and awareness raising resources on a variety of IAS. These were produced in both Greek and English, and physical copies have been shared with the AEEC and the Department of the Environment;
- by inviting local schools to the AEEC during our workshops, enabling academics involved in RIS-Ký to communicate their work to local children and teachers;

- by developing teaching resources centered around IAS and pollinators in collaboration with environmental educators based at AEEC;
- by hosting the University of the 3rd Age (U3A) members to the AEEC for mosquito and pollinator days;
- by working with “citizen scientists” to collect monitoring data on both terrestrial and marine habitats around the Akrotiri peninsula (both through ongoing monitoring efforts, and through the BioBlitz - see section 3.1), and by involving representatives of this community in the August 2017 workshop on capacity building.

Given that large parts of our project were dependent on stakeholder engagement and consensus methodologies (primarily WPs1 and 3, but also parts of WP2), our project embedded the principle of stakeholder involvement in decision making and output creation throughout its life-cycle. The multi-author horizon scanning paper (Peyton et al. 2019) is just one outstanding example of this approach.

Another example of one of the achievements of our project, but one which also serves as an illustration of the challenges associated with the citizen science approach, concerns the marine surveys. At the beginning of our project we met with divers from the western Sovereign Base Area Sub-Aqua Club. The divers showed interest in the recording of IAS, and were informed further on ways they could assist with data collection through face-to-face meetings and collaborative diving activities. A simple method of Underwater Visual Census survey suitable for being carried out by volunteers was presented to the divers and the necessary equipment supplied. However, it proved challenging to coordinate the volunteer divers over the first year of the study despite repeated attempts: involvement in the surveys was low. Recognising the difficulties, we eventually found a contact point on the Base to establish coordinated approaches to communication. Consequently volunteers set up a permanent rope transect that can now be monitored regularly for IAS. This transect was also then used by the recording team of UCY.

### 3 Project Achievements

#### 3.1 Outputs

##### 1. Horizon-scanning and IAS of concern listed for Akrotiri OT and other OTs in Cyprus: Completed and open access peer-reviewed publication available [online](#) through journal.

In 2017, the project ran a horizon scanning exercise with over 50 experts from across Cyprus and Europe; the baseline condition is of course that no previous assessment of this nature existed for either Cyprus or the SBAs. The horizon scan was undertaken for the entire island of Cyprus. The thematic groups did however consider the relevance of the top 100 species to the Sovereign Base Areas of Cyprus, given their differing governance. This horizon scan provided the first systematic exercise to identify IAS of potential concern to biodiversity, ecosystems and human health within the Mediterranean region (published as Peyton et al. 2019). The process and outcomes also provide other islands in the region and beyond with baseline data to improve IAS prioritisation and management (indicator **0.1**).

##### 2. Targeted mapping of IAS for Akrotiri and other OTs in Cyprus: Completed and data [submitted](#) to NERC Environmental Information Data Centre (EIDC)

Other than for mosquitoes, the only baseline data the project had access to was survey data generated as part of the two EU COST Action projects undertaken by Pescott, Peyton and Mountford in 2015/2016 (see references), an island-wide inventory of IAS derived from earlier projects (Martinou et al. 2018), and data from preliminary surveys on *Gambusia* invasive alien fish undertaken by JSHU. Our project has led to over 10,000 records of more than 700 verified mapped IAS and native species to the datasets of Cyprus across terrestrial and marine environments (indicator **0.2**), including five new invasive alien plant species for Cyprus (final numbers to be confirmed following consolidation of the plant datasets). The freshwater fish (Winfield et al. 2019) and marine survey (Demetriou, 2019) data are available through the EIDC, via the RIS-Ký project [Resources](#) page. In addition to species records, the project has added habitat data from Lake Akrotiri to the open access EIDC (Pescott et al. 2017); other plant species

data are in the process of being directly uploaded to the Global Biodiversity Information Facility (GBIF), another open access platform that will serve to maximise data reuse and availability (indicators **0.2, 0.3**).

The following list shows some of the key invasive alien and native taxa that this two-year project has generated distribution data for within the SBAs. The species were identified through stakeholder meetings (indicator **0.3, 1.2**) and the horizon scanning (indicator **0.1, 1.1, 1.2**) exercise:

- Port Jackson Willow *Acacia saligna*
- *Casuarina* spp.
- *Eucalyptus* spp.
- Eastern Mosquitofish *Gambusia holbrooki*
- Mediterranean Killifish *Aphanius fasciatus* (native)
- Surveillance of *Aedes* invasive mosquitoes of concern (*Aedes albopictus* and *Aedes aegypti*) not yet on island and establishment of an early warning system
- Lionfish *Pterois miles*
- Toadfish *Lagocephalus* spp.
- Rabbitfish *Siganus* spp.
- Cornetfish *Fistularia commersonii*.

The data provide baseline information to inform early warning systems and future research. The open access geo-referenced mapping of IAS plants and aquatic species will enable management to be undertaken as necessary by land managers to present the spread of IAS (indicator **0.2**).

*Taxonomic summaries* (indicators **0.2, 0.5, 1.2, 2.1, 2.2, 3.2**)

**Botanical surveys:** Over two weeks in February and March 2018, the survey of the Akrotiri SBA (with Episkopi) covered all the land area from Avdimou (“Kýrenia”) beach in the west eastward to the outskirts of Lemesos city, and south to Akrotiri airfield. A shorter survey of the Dhekelia SBA comprised sampling of a representative range of habitats, including phrygana, shoreline and disturbed ground by the base itself, agricultural land near Xylotymvou and limestone pavement at Potamos. Thirty-eight tetrads (2 x 2 km grid squares) were assessed in total i.e. some 152 km<sup>2</sup> of the two SBAs (Figure 3). During this survey, five new IAS were recorded, species previously having not been seen on Cyprus before. Overall this survey resulted in around 2200 new species records of around 500 native and non-native species, a huge increase in the amount of biodiversity data available for the SBAs (cf. Churchyard et al. 2016); previously almost no openly available, well-localised, botanical data, excepting written descriptions of locations in Floras etc., existed for Cyprus (Key, 2017).

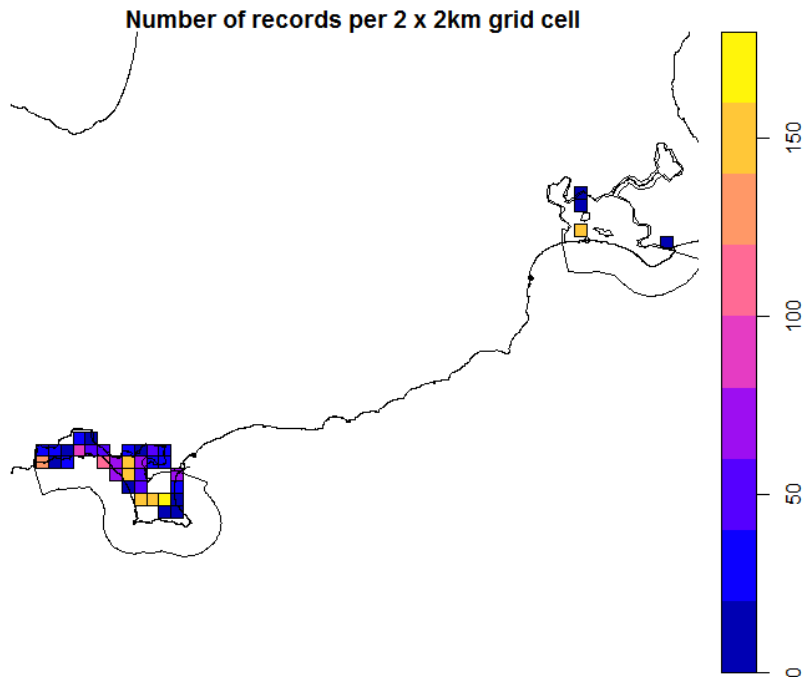


Figure 3. The number of records (i.e. species occurrences) per 2 x 2 km UTM grid cell (UTM grid cell layer available via RIS-Ký website; Pescott, 2018). The territory to the left of the map is the Western Sovereign Base Area (Akrotiri); that to the right the Eastern Sovereign Base Area (Dhekelia).

In 2019, comparative assessments were undertaken between invaded and non-invaded habitats on the SBAs of Akrotiri and Dhekelia. These surveys were undertaken in order to attempt to quantify the magnitude of impact of IAS on native plant community structure. The results of this will be analysed and made available via GBIF in the near future. The 2019 dataset comprises 1660 species occurrences across 102 quadrats (51 in invaded and 51 in uninvaded habitats). We are not aware of any other vegetation plot data available for Cyprus. So, not only does this constitute a new resource for understanding plant invasions in Cyprus, but also, more generally, for understanding the communities and associations of plants in typical Cypriot habitats.

**Fish (freshwater):** Between 26 February 2018 and 25th January a total of 89 fish monitoring events were carried out. This resulted in the sampling of 2,898 native *Aphanius fasciatus* specimens, ranging between 5 and 56 mm in length; and, 4,524 non-native *Gambusia holbrooki* fish ranging between 4 and 55 mm in length.

**Marine:** Four marine invasive alien species were identified for monitoring and surveying, following the Horizon Scanning workshop and through consultations with stakeholders. The four species were the lionfish (*Pterois miles*), toadfish (*Lagocephalus* spp.), rabbitfish (*Siganus* spp.) and cornetfish (*Fistularia commersonii*). Nine surveys took place in Akrotiri over the two year period. Thirty-one occurrences of marine IAS were detected (Demetriou, 2019). Additional to project design, two baseline surveys took place in Dhekelia (the eastern SBA in Cyprus). The proximity of the sampling site to the shore rendered the use of a boat unnecessary and the money saved was used to purchase a GoPro underwater camera and lights as well as a temperature and salinity logger. The camera has been used during samplings to record IAS. All photographs taken during sampling will be uploaded to the relevant species accounts on CyDAS. The temperature and salinity logger will be deployed permanently and set-up by the UCY team at Akrotiri, in order to collect long term temperature and salinity data which will be shared with the SBAs. The seasonal data collection in Akrotiri and the baseline surveys in Dhekelia are indicators of the project's success in achieving its intended outcomes, since the field surveys, in combination with the horizon scanning exercise, have prioritised the list of alien species for which monitoring has taken place during the project, and will continue to be investigated through the help of volunteer divers.

**Invertebrates:** Pollinating insects – we developed an approach to monitor pollinating insects using Cypriot-specific modifications to the UK Pollinator Monitoring Scheme (PoMS) – Flower Insect Timed (FIT) Counts. The methods were developed in collaboration with AEEC staff to ensure applicability. To date 103 records of pollinating insects have been collected during the project duration by CEH ecologists, alongside two training events with AEEC staff.

Aedes Invasive Mosquito (AIM) surveys were undertaken every two weeks at points of entry within the western SBA based on recommendations by the European Centre for Disease Prevention and Control using BG sentinel traps with BGlure (Biogents) by the Joint Services Health Unit. No AIM species were recorded during the AIM surveys. However the surveys will continue and will be undertaken by the Joint Services Health Unit every two weeks. Five traps are currently used for that purpose, with batteries and expenses for future surveys covered by JSHU.

#### *Online databases and recording (indicator 3.1)*

Our project has enabled the mobilisation of the Cyprus Invasive Alien Species (CYIAS) inventory (Martinou, 2014) through the designated project website, the Cyprus Database of Alien Species ([CyDAS](#)). Previously this list was only available in a variably-formatted set of spreadsheets. Now, this uniformly-formatted and well-documented resource is an important legacy of the project, and is openly available for use by multiple stakeholder and end-users (see previous weblink). Additionally, all data captured through the development of PoMS-Ký has been submitted online and summary data can be used to gather baseline assessments of pollinator abundance if surveys continue to be undertaken (none such previously existed for Cyprus). Finally, the iNaturalist app and website were used in the 2019 BioBlitz, with 1906 records of 495 taxa collected (currently, June 2019, 981 of these are 'Research Grade' and so have been shared with GBIF, ensuring that they are available to all). This was the first ever BioBlitz on Cyprus; not only, then, did the event create new biodiversity taxa for a range of previously neglected taxon groups, but it also introduced a new type of citizen science to the island.

### **3. IAS surveillance strategy developed with target audience: Completed through design of taxon specific survey methodologies (executed under 2 above).**

Annex 6, SM1, lists the methodologies (indicator 0.5, 3.2) undertaken for the surveys of the taxonomic groups. Other than for the mosquito surveys, all methodologies have been developed as part of this project. The project worked with key stakeholders (primarily SBA staff and military) to develop a list of target species for surveys across taxonomic groups. The results of these surveys are listed above, and methods are also documented as metadata within EIDC data deposits, or will be described fully in journal and data papers currently in preparation (indicator 5.7).

### **4. Training and capacity building provided for OT government staff on the identification and management of IAS: Completed through workshops, training activities undertaken, and a BioBlitz**

A key aim of the project was to promote and encourage biological recording on the SBAs and as such, the project ran capacity building and training events throughout the two year duration. Although it is difficult to assess the baseline state in this instance, feedback from workshops (annex 6) suggested that participants found the various workshops (indicator 0.4, 4.2, 4.3, 4.4) of value; the fact that outputs from one (the horizon scan) has already resulted in a published outputs also suggests that valuable activities resulted from these.

In particular, we ran a capacity-building workshop "Capacity Building in Monitoring and Surveillance of native and non-native species" on 31<sup>st</sup> August 2017 at the Akrotiri Environmental Education Centre (AEEC) (indicator 4.3). The workshop focused on recording (both paid and voluntary) on the SBAs and in the Republic of Cyprus, see annex 6, SM2, for the programme. Representatives of the biological recording community both in the UK and in Cyprus gave presentations on the monitoring currently being undertaken in Cyprus, including on SBAs. These presentations are available on the project [website](#). As part of this activity, we created bilingual mini-guides Complementary Materials (in [English](#) and [Greek](#)) to increase public awareness

around IAS in Cyprus. We distributed these within the AEEC, the Department of Environment (Cyprus), and local schools. In addition to the creation of open access guides, fliers and protocols, JSHU staff have been trained in operation of fresh/brackish water quality monitoring for temperature, dissolved oxygen and conductivity/salinity, as well as fish sampling protocols and these measures will continue after the end of this project. This is a clear step-change in the local monitoring capacity for this group.

Elsewhere, SBA divers have been equipped with a new methodology for surveying for marine IAS. Training of volunteer divers took place on various occasions during the project, with dedicated presentations on the survey methods taking place twice at the Western Sovereign Base Area Sub-Aqua Club. Uptake by the divers for marine species, despite the initial enthusiasm, is difficult to sustain as the divers are mainly military personnel who tend not to remain in any given posting for long. However, divers from the local community also expressed interest in assisting with data collection, which will be beneficial as such local citizen scientists are more likely to have sustained long-term involvement than military personnel who are posted short-term (note, however, that trained military personnel could go on to contribute to monitoring efforts in other UKOTs).

Biosecurity training (indicator **4.4**) on mosquito control and management has been provided through questionnaires and leaflets, and has fed into a draft Code of Practice for wetland management for mosquitoes. This Code of Practice is being prepared in collaboration with participants in the workshop “Native and non-native vector management in the Eastern Mediterranean and the Middle East (EMME)” held in April 2018 (project year 2). The team also worked with AEEC education staff throughout the project to incorporate mosquito awareness and management into their education programme. The leaflet that the team designed and distributed through the military and the AEEC, as part of this workshop, is given in annex 6, SM3. As part of this workshop, the project undertook multilingual ([English](#), [Greek](#) and [Turkish](#)) questionnaires for stakeholders to get a better understanding of the attitudes around mosquitoes. This ongoing work has resulted in 97 English language questionnaires being completed, 51 Greek language and 44 Turkish language questionnaires. Such high uptake demonstrates the interest from citizens across Cyprus in this area.

The new pollinator monitoring recording scheme ([PoMS-Ký](#)) was developed in collaboration with the AEEC, the Cyprus Butterfly Study Group, a PhD student from the Cyprus University of Technology, and an MS student from the National and Kapodistrian University of Athens and is based on the established UK [Pollinator Monitoring Scheme](#) (indicator **2.1**). The project has developed an associated [online recording system](#) (indicator **3.1**) see Annex 6 SM4). This scheme will provide an opportunity to develop further research on the impacts of non-native species on ecosystem function through assessing pollinator interactions with IAS and native plant species.

In March 2019, the project team co-led a Bioblitz (indicator **2.1, 4.3**) alongside an EU COST Action event ([Alien CSI](#)). The event took place for 24 hours between Wednesday, February 27 and Thursday, February 28, 2019 and involved over 50 scientists from across Europe working with approximately 20 citizen scientists from the SBA and across Cyprus to record taxa across the SBA of Akrotiri. The aim was to improve knowledge of the biodiversity of the Akrotiri Peninsula, identify potential risks to biodiversity caused by IAS, and trial methods that could be used throughout Europe for this purpose. During this time period, over 1900 biological records were made, over 50% of which were deemed to be research grade and thus uploaded to the GBIF. Figure 4 shows the outputs from this activity.



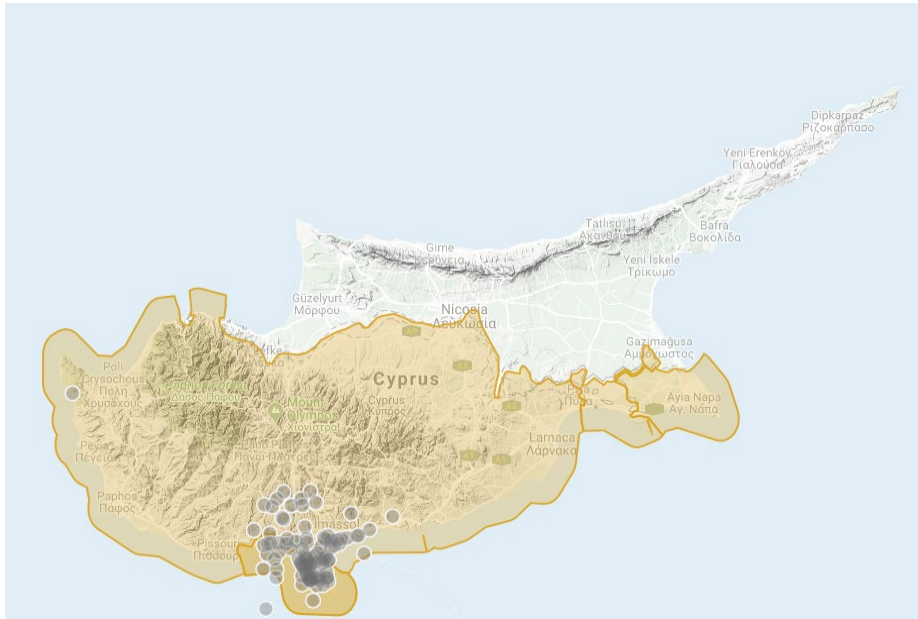


Figure 4. Location of records collected as part of the Akrotiri Bioblitz, based at the AEEC in February 2019.

The project utilised online recording through a project specific platform for PoMS-Ký, with iNaturalist being used in the 2019 BioBlitz.

## 5. Effective project management and reporting. Completed

Project meetings (indicators **5.1**, **5.2**, **5.5**) were run throughout the two-year project duration and were all documented with minutes (available on request). The project ran a final workshop where the results of the project were disseminated to stakeholders from the SBA and military as well as Cypriot academia, NGOs and government. Publications (indicators **5.7**) are reported in section 6 and Annex 4, as well as on the website. The project has resulted in the publication of one peer-reviewed paper, two peer-reviewed book chapters, and the submission of the Code of Practice for mosquito management in wetlands manuscript, recently submitted to the *Journal of Applied Ecology*. Additional papers and datasets are planned to follow.

### 3.2 Outcome

*Outcome: Sustainable surveillance of current and potential future IAS in OTs in Cyprus, supported by local organisations and stakeholders, founded on a robust and open evidence base.*

The project has delivered this outcome through the successful development of low cost, survey methodologies (indicators **0.3**, **1.2**, **2.1**), suitable for uptake from both paid staff and volunteer citizen scientists. The successful completion of the horizon scanning workshop achieved indicator **0.1**. This workshop involved over 50 stakeholders (indicator **0.3**) from across Cyprus and Europe to, through a consensus approach, generate a list of over 200 IAS species with potential to arrive to the island of Cyprus and negatively impact biodiversity and have an impact on human health and economy. The paper was, through project funds, published open access in an international journal in April 2019 (indicator **5.7**).

Through a series of systematic terrestrial, marine and freshwater surveys, designed with input from local SBA, Cypriot and military stakeholders, the project has collected over 10,000 records of more than 700 verified IAS and native species (final number to be confirmed following consolidation of plant dataset) in the SBAs of Cyprus, a number which far exceeds our initial ambition to document 10 species (indicator **2.1**) across the area. The successful completion of taxon-specific surveys are evidence of achieving the following measurable indicators **0.2**, **0.3**, **0.5**, **1.2**, **2.1**, **2.2**, **3.1**, **3.2**, **4.1**, **4.2**.

Methodologies for these surveys are given in Annex 6, SM1 (indicators **0.3**, **1.2**). Data from marine (Demetriou, 2019), freshwater fish (Winfield et al. 2019) have been uploaded and plant survey data are in the process of being uploaded to open access platforms (although some are already available on the EIDC and on GBIF through iNaturalist). Data from our pollinator surveys

are currently stored on the project database and can be accessed by third parties by request, although ultimately bundled data will also be made available through the EIDC. Mosquito data are currently being prepared for uploading. Open access survey datasets being available link are achieving indicators **0.2** and **2.1**.

Additionally, the project has enabled the mobilisation of data collated under other projects to open access platforms (indicator **3.1**). The publication of IAS stand mapping data, collected through an EU COST Action Short Term Scientific Missions (STSM) (Pescott et al. 2017). This dataset gives forest stand and species occurrence data for a selection of non-native species collected in the UK Sovereign Base Areas (SBA) of Cyprus in October 2015 and March 2017. The datasets focus on the area surrounding Lake Akrotiri in the Western SBA. The main focus for mapping was stands of the following IAS: *Acacia saligna*, *Casuarina cunninghamiana*, the eucalypts *Eucalyptus camaldulensis* and *E. gomphocephala* and *Symphytotrichum squamatum*. The project also led to the mobilisation of a dataset of IAS created through a separate EU COST Action STSM. This previously static, unstandardised, dataset is now available online, through the project website ([CyDAS](#)) (indicator **0.2**), with all records incorporated to the Global Register of Introduced and Invasive Species (GRIIS) (Martinou et al. 2018). The initial compilation of the database included data from DAISIE, EASIN, GBIF, and data from the unpublished ELNAIS database maintained by Dr Argyro Zenetos at the Hellenic Marine Research Centre. Since this initial compilation, data has also been contributed by Nikolas Michailidis from the Department of Fisheries and Marine Research (Republic of Cyprus Government), demonstrating the resources' applicability to local stakeholders and will continue to be updated by the project partners after project end. The addition of this resource to the datasets of the SBA and Cyprus as a whole, demonstrate the successful completion of indicator **0.2** and **3.1**.

The development of a Code of Practice created through the project will offer, when published, criteria for the surveillance and control of mosquitoes in European wetlands. Such a Code of Practice will allow wetland managers and public health authorities to manage wetland mosquito populations both effectively and environmentally sustainably. Although this Code of Practice was developed by European experts it is transferable to other geographical contexts if the expertise and knowledge of local stakeholders and researchers is utilised during the uptake. This Code of Practice directly links to the UKOTs Biodiversity Strategy (ii) *preventing the establishment of IAS, and eradicating or controlling species ... already ... established* through surveillance and management guidance (indicators **0.3**, **3.2**, **4.3**).

Sustaining volunteer engagement with surveys has been the only challenge experienced through this project, but we have demonstrated an underlying interest, through engagement and training events in biological recording. The project team are fortunate in that this interest and enthusiasm can further be capitalised on, in terms of citizen science engagement, through a new Darwin Plus project (DPLUS088 - Addressing drivers of change in Lake Akrotiri).

Reporting throughout the project was undertaken on time, with no requests from funders for clarification on the results or progress (as demonstrated through completion of indicators **5.3**, **5.4**, **5.5**, with the current report being indicator **5.6**).

### **3.3 Long-term strategic outcome(s)**

The strategic priorities for the UK Government's support in relation to biodiversity conservation in the UK Overseas Territories have been a focus through the design and implementation of the project. Specifically four of the five priorities outlined in the United Kingdom Overseas Territories Biodiversity Strategy (Defra, 2009):

- i. obtaining data on the location and status of biodiversity interests and the human activities affecting biodiversity to inform the preparation of policies and management plans (including baseline survey and subsequent monitoring) (indicators **0.2**, **0.3**, **0.5**, **1.1**, **1.2**, **2.1**, **2.2**, **3.1**, **3.2**)
- ii. preventing the establishment of invasive alien species, and eradicating or controlling species that have already become established (indicators **0.3**, **0.5**, **3.2**, **4.3**)

iv. developing tools to value ecosystem services to inform sustainable development policies and practices (indicators **0.1, 4.3**)

v. developing ecosystem-based initiatives for the conservation and sustainable use of the marine environment (indicators **0.1, 0.2, 0.3, 0.4, 0.5, 2.1, 3.2**)

Specifically the outcomes of project have enhanced data-holdings of IAS on the SBAs of Cyprus, in both terrestrial and marine habitats. This data, through publication in open access platforms, will enable evidence-based management decisions to be adopted going forward by SBA staff. Indeed dissemination materials and public engagement activities have increased awareness of the issues of IAS and specifically emerging species identified through the horizon scanning. The project has worked with SBA staff throughout its duration to enable optimal knowledge exchange opportunities.

The project, from inception, had support from the Cypriot Ministry of Agriculture, Rural Development and Environment (indicator **0.3**), and throughout the project duration we have worked closely to keep the Ministry updated and included on workshops and outputs (see [Blogs](#) and [News](#) items on the project website; indicator **5.7**). We have received excellent feedback from stakeholders on the value of the project deliverables. Indeed CEH, JSHU and the AEEC have been awarded a subsequent Darwin Plus Award (DPLUS088). again supported by the Ministry of Agriculture, Rural Development and Environment, which demonstrates the value of the work resulting from this project.

Data on marine IAS collected during the project are highly relevant for reporting to the EC in response to the EU Regulation 1143/2014 on Invasive Alien Species, regarding prevention, early detection and management. More specifically, the data collected through Ris-ky comply with the regulation's measure "Early detection and rapid eradication", where "member states must put in place a surveillance system to detect the presence of IAS of Union Concern as early as possible". The involvement of volunteers in the collection of data on marine IAS is also relevant to the citizen science supported by the European Commission. In order to facilitate the implementation of the EU policy on invasive alien species, the EC is supporting data collection from citizen scientists that help monitor IAS. The involvement of volunteers in this project enables citizens to report IAS occurrences in Europe, contributing to early detection of invaders and it also feeds information on different European projects e.g. RELIONMED-LIFE.

Undertaking horizon scanning to inform biosecurity was seen as a priority for all the UK Overseas Territories (Key 2017). The horizon scanning element of this project fed into a wider UK Government funded project to help inform biosecurity protocols on the SBAs and within Cyprus (see [here](#)).

The ways in which we have achieved value for money are outlined in detail in Sections 7.2 and 7.3, however, the project team, through support from their respective organisations (CEH and JSHU), contributed over £115K in in-kind funding and estimates of the in-kind contributions of workshop delegates of over £300K; this external expertise added considerably to the project and also enabled international reach for the project.. Additionally, the activities of the project team through representation at international meetings and through global initiatives have enabled us to publicise the work of Darwin Plus and the project beyond the scope forseen at project inception.

With the exception of mosquitoes, there has been no previous attempt to record IAS so comprehensively across taxonomic groups in Akrotiri and Dhekelia whilst ensuring the generated data were made openly available to other user groups. We are confident that this project has significantly increased baseline biodiversity knowledge in the area for future management and monitoring efforts to built upon.

#### **4 Sustainability and Legacy**

Throughout the project, we worked with all our collaborators to promote the project across the SBA, Cyprus and Europe as a whole (as demonstrated by our workshop attendees). Our central theme was the development of approaches that are applicable to OTs on Cyprus (and

elsewhere), which could be applied and continued by local personnel and stakeholders. Training events throughout the project and provision of support resources, together with stakeholder involvement form an essential part of the project, ensuring the immediate knowledge gains are sustained and augmented beyond project completion. Online support and engagement has widened the communication and support network on IAS within Cyprus and will contribute to the sustainability of the project.

The collection of data on the presence and extent of IAS in the area has created a baseline on which future surveys can be developed. Indeed, as a result of the work undertaken in this project, CEH, JSHU and AEEC were awarded a subsequent project to continue to work on Lake Akrotiri (DPLUS088). For the marine surveys, local divers' association showed a great interest in this project and have been trained in data collection. These divers are in contact with members of UCY's team in order to keep sending data and photos of IAS, which they will keep collecting well after the end of this project. The team at UCY will continue to record IAS in Cyprus, including the OT's, through other ongoing projects. The underwater camera will be used during dives and any relevant photos collected will be uploaded on CyDAS, which members of UCY will keep updated regarding marine IAS. Further, the underwater temperature and salinity logger that will be deployed in Akrotiri will collect data in the long-term on the physical properties of the sea in the area.

CyDAS is an important legacy of the project as it is openly available for use by multiple stakeholders and end-users and will be regularly updated and maintained by multiple partners. The fact that CyDAS draws on international standards, such as the Catalogue of Life (for its taxonomic treatment) and GBIF (for the distribution maps), also reduces the effort involved in keeping the site up-to-date; for example, species records added to GBIF through any mechanism will be shown on the maps displayed in CyDAS. We hope that CyDAS will eventually be handed over completely to local managers, and become an official mechanism for Cyprus to report on new IAS occurrences.

The project had high level support from both British Forces Cyprus and the JSHU, whose personnel were trained in techniques that can ensure consistent monitoring of IAS and assessment of their impact (e.g. invasive fish studies and control programmes that could be undertaken after the end of the project). These approaches are documented in Annex 6 SM1). Relevant Akrotiri personnel were trained in priority biosecurity measures around AIM mosquitoes, identified in the earlier stages of the project.

The publication of the horizon scanning manuscript and the recently submitted Code of Practice further ensure the results and outputs created through this project are publicised widely in both the academic and practitioner communities.

## **5 Lessons learned**

In order to monitor and evaluate our project progress, CEH, with JSHU and the UCY held regular formal team meetings (via Skype) and recorded all the large amount of email correspondence across the team to ensure that any potential challenges are picked up before they escalate into major problems. Achievements throughout the project were assessed against stated measured indicators and associated means of verification in the logframe. The excellent collaboration of the partners and stakeholders involved was a major key to the success of the project.

The project was, due to the difficulty of accessing fine scale environmental predictors for modelling exercises, unable to undertake the modelling component of the proposed project plan. We have however, through the comprehensive surveys, enabled the recording and mobilisation of over 10,000 species records that can now be used for future assessments and reporting for the SBAs Cyprus. Additionally, during the course of this project the project team have been in communication with staff from the DIO Data, Analytics & Insight Directorate with the intention of sharing data collected through this survey and utilising data collected as part of military surveys for use in a subsequent Darwin award received by CEH, AEEC and JSHU.

Through the project, a network of stakeholders was developed that proved exceptionally effective in ensuring the relevance of project tasks as the project progressed. Indeed, at the start of the

project, whilst running the horizon scanning workshop, we were fortunate to be able to work alongside Cypriot Government staff, who had also wanted to undertake a similar exercise. As such, this project delivered results of EU reporting significance for both the SBAs and Cyprus in one comprehensive workshop.

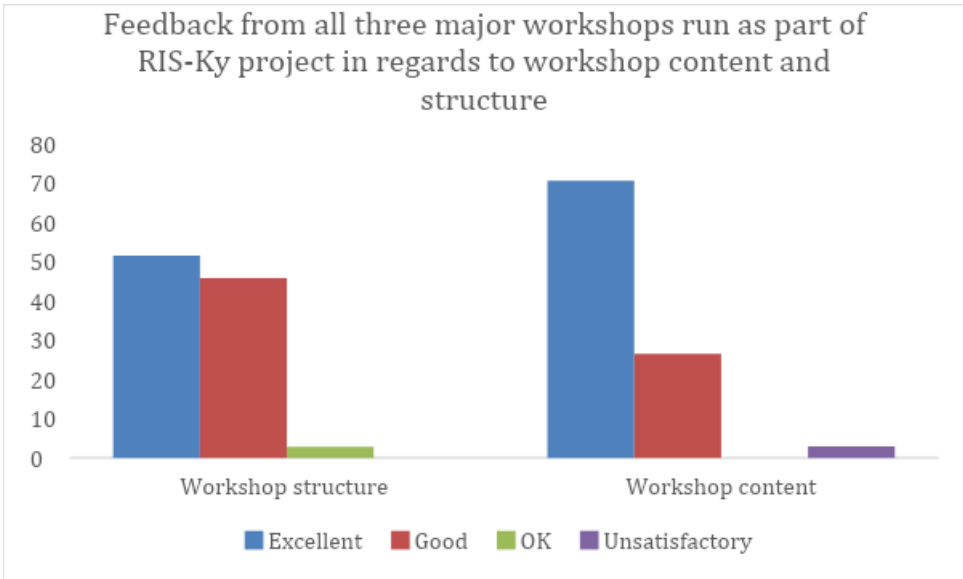
We were keen to ensure that we maintained motivation and enthusiasm in all volunteer communities with which we worked. We gathered feedback from participants to enable us to evaluate and adapt approaches to ensure that the tasks were achievable. Sustaining involvement in some of the more involved volunteer surveys (marine and pollinator surveys) has been challenging, but there is interest from volunteers to continue to collect records for the survey, we view these elements of the project as a success. The high turnover of military personnel is a potential barrier to long-term engagement. Additionally one key lessons learnt regarding marine surveys was some technical aspects of the surveys. The sampling was designed originally in order to use a boat to access the dive sites. However, after consulting with local divers, it was decided to survey an area that was easily accessible from the shore. This did not interfere with the actual surveys, but it highlighted the importance of collecting such information from local stakeholders early on.

**5.1 Monitoring and evaluation**

The project ran almost entirely as outlined in the proposal; however, due to a lack of baseline data, modelling was not achievable. However, the distribution maps and analysis of information collated through horizon scanning has potential for future modelling.

Churchyard et al. (2016) reported that biodiversity data searches for the Cyprus SBAs found many resources for Cyprus at an island level, however little data was openly available specifically to the SBAs so our knowledge of the biodiversity of the Cyprus SBAs is the poorest of all the UKOTs. This project has added significantly to the knowledge base of the SBAs.

Given the major focus on workshop delivery during the project, workshop feedback forms were chosen as the main means through which M&E was undertaken, which worked with participants. We circulated feedback forms for the three main workshops run through the project after each workshop (example survey in Annex 6 SM5). Fig 5 below shows the feedback summaries, with respect to workshop structure and content (a) and with respect to learning and understanding through attending the workshop (b) for all three workshops.



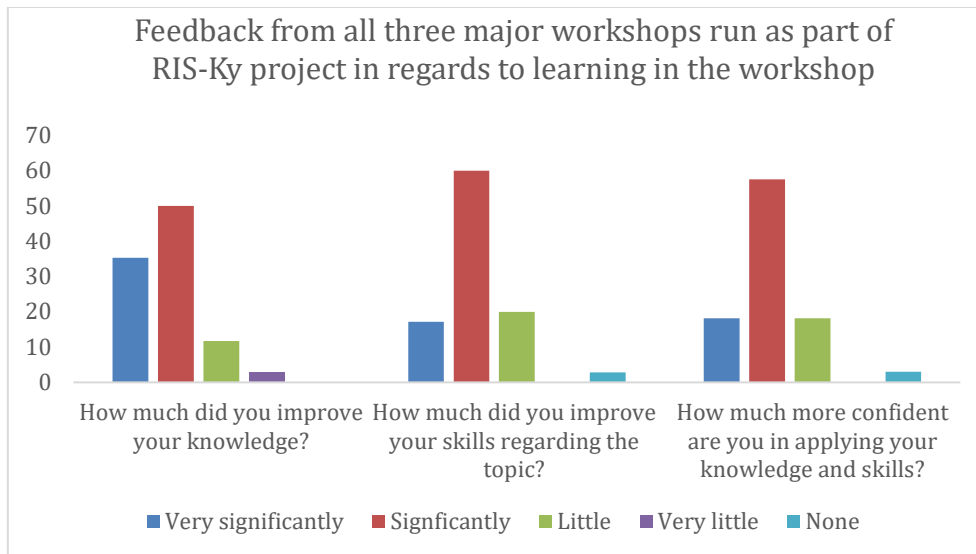


Figure 5. Summary of feedback from all three workshops, completed as part of project M&E. Workshop feedback data can also be found in Annex 6, SM5).

In terms of recognition of recognition outside the project stakeholders, the project was recently mentioned in the statement for the Certificate of Commendation awarded to JSHU by the Commander Joint Forces Command, General Patrick Sanders in recognition of the collaborations and results that the project generated.

## 5.2 Actions taken in response to annual report reviews

No action was needed from any of the reporting.

## 6 Darwin Identity

The project has a designated Facebook page with over 200 members. Each post typically receives around 120 views. The project also has a Twitter account (@RiskýAliens). The [News](#) and [Blog](#) pages of the project website are regularly updated as items are created.

The following have been published from the successful award of this project:

**Peyton, J., Martinou, A.F., Pescott, O.L. et al.** (2019) Horizon scanning for invasive alien species with the potential to threaten biodiversity and human health on a Mediterranean island. *Biol. Invasions*. 21(6):2107–212 <https://doi.org/10.1007/s10530-019-01961-7>

**Martinou, A.F. and Roy, H.E.** (2018) From local strategy to global frameworks: effects of invasive non-native species on health and well-being. In *Invasive Species and Human Health* (Eds: Mazza, G. & Tricarico, E.) CABI Publishing.

**Pescott, O.L. et al.** (2018) The forest on the peninsula: Impacts, uses and perceptions of a colonial legacy in Cyprus. In: *Histories of Bioinvasions in Mediterranean-type regions* A.I. Quieroz and S. Pooley, Eds, pp. 195-217, Springer.

**Martinou A, Pescott O, Michailidis N, Zenetos A, Jenna Wong L, Pagad S** (2018). *Global Register of Introduced and Invasive Species- Cyprus. Version 1.6*. Invasive Species Specialist Group ISSG. Checklist dataset <https://doi.org/10.15468/uryl57> accessed via GBIF.org on 2019-06-22).

In addition to the above, the project has been published twice in the Darwin Newsletter ([February 2019](#) and [August 2018](#)). The Cyprus Mail has also featured the project and staff in [five](#) newspaper articles, thus increasing the publicity of the project across Cyprus. Most recently, the project was invited to submit a full article for the MOD Conservation Magazine, *Sanctuary*. Such promotion of the project, within the military audiences, gives further evidence of the recognition of the value of the results and outputs from the project.

CyDAS: One of which is the publication of CyDAS (Cyprus Database of Alien Species) online and through [GRIIS](#) (the Global Register of Introduced and Invasive Species). CyDAS is based on the initial work of Dr Kelly Martinou, who collated lists of alien species on Cyprus from the DAISIE and ELNAIS databases. As a part of the RIS-Ký project, we have transferred this information into a new database, with a unified set of fields, with the aim of making a "one-stop-shop" of information on alien species on Cyprus ([www.ris-ku.eu/cydas](http://www.ris-ku.eu/cydas)). The work undertaken on this project is outlined on the CyDAS [website front page](#) and overviewed in annex 6. This output has been standardised to follow the international Catalogue of Life taxonomy, and also retrieves distribution maps from GBIF for display. This database will be curated by local and international experts in the future.

The project and funders were mentioned in the following plenary lectures, in addition to the workshop presentations listed below:

1. Horizon Scanning workshop, AEEC, Cyprus - April 2017
  - a. **Peyton J** *RIS-Ký Overview*
  - b. **Pescott, O** *The importance of scale with invasive species*
  - c. **Schafer, S.** *Vector monitoring*
  - d. **Winfield, I.** *Monitoring and surveillance - freshwater fish*
2. **Roy, H.E.** (2017) *Unravelling the Ecology of Non-native Species to Inform European Strategy*. Global Action Against Aquatic Invasive Species. ICAIS, Florida, 22-26 October 2017.
3. **Roy, H.E.** (2017) *How to promote and benefit from the collaboration from citizen scientists*. Ecology and Management of Alien Plant Invasions (EMAPI), Lisbon, 4-8 September 2017.
4. **Roy, H.E.** (2017) *Sharing information on invasive non-native species across Britain and beyond*. British Ecological Society The Macroecology of Alien Species: Patterns, Drivers and Consequences of Global Biotic Exchange. Durham, 24-26 July 2017
5. Capacity Building in Monitoring and Surveillance of Native and Non-native Species
  - a. **Peyton J** *RIS-Ký Overview*
  - b. **Roy, H.** *Engaging your audience*
  - c. **Pescott, O** *Recording Invasive and Non-native plant species in the Cyprus SBAs*
  - d. **Demetriou, M.** *Overview of marine monitoring in Cyprus*
  - e. **Martinou, K.** *Invasive mosquito monitoring - are we doing enough?*
  - f. **Roy D.** *Biological recording - filling evidence gaps - the UK-EU perspective*
6. **Peyton J.** et al (2017) *Horizon Scanning for Invasive Alien Species in Overseas Territories in Cyprus*, also presented at EMAPI and a British Ecological Society special meeting on macroecology and plant invasions (see SM 3).
7. Native and non-native vector management in the Eastern Mediterranean and the Middle East (EMME), AEEC, Cyprus, April 2018:
  - a. **Peyton, J.** *RIS-Ký Overview*
  - b. **Roy, H. E.** *Alien pathogens on the horizon.*
  - c. **Schafer, S. & Martinou AF** *Mosquitoes and you*
  - d. **Winfield, I. J.** *Overview of wetlands and their importance*
  - e. **Martinou, A. F. et al.** *Code of Practice of mosquito management in European wetlands*
8. **Roy, H.E.** (2018) *Wildlife needs you*. New Scientist Live. London, UK, 22 September 2018
9. **Roy, H.E., Brown, P.M.J., Botham, M., Peyton, J.M., Rorke, S.L., Beckmann, B.** (2018) *Engaging people in surveillance and monitoring of non-native species*. IOBC WG Meeting Risks and Benefits of Exotic Biocontrol Agents. Azores, 10-13 September 2018
10. **Roy, H.E.** et al. (2018) *Unravelling the Ecology of Non-Native Species to Inform European Strategy*. IOBC WG Meeting Risks and Benefits of Exotic Biocontrol Agents. Azores, 10-13 September 2018. Keynote Speaker.
11. **Roy, H.E.** et al. (2018) *Horizon scanning for invasive alien species likely to threaten biodiversity in the European Union*. Neobiota, Dublin, Ireland, 3-6 September 2018.

12. **Roy, H.E.** et al. (2018) *Citizen science approaches to unravelling the ecology of non-native species to inform European Strategy*. European Science Open Forum, Toulouse, France, 11 July 2018. Invited Speaker.
13. **Roy, H.E.** et al. (2018) *Unravelling the Ecology of Non-Native Species to Inform European Strategy*. Artsdatabanken IAS Conference. Oslo, Norway, 5 June 2018. Keynote Speaker.
14. **Roy, H.E.** et al. (2018) *Ecology of non-native species: from research to strategy*. YNU Conference, York, 7 April 2018. Keynote Speaker.
15. **Roy, H.E.** et al. (2018) *Ecology of non-native species: global perspectives*. Insect Invasions, Monash University, Australia, 19 March 2018. Keynote Speaker.
16. **Roy, H.E.** et al. (2018) *Ecology of non-native species: global perspectives*. Cork University, Ireland, 23 February 2018. Invited Speaker.
17. **Winfield, I. J.** et al (2018) *Monitoring and management of the native Mediterranean killifish and introduced fish species in the poikilohaline environment of the Akrotiri Peninsula, Cyprus* at the Institute of Fisheries Management Specialist Conference 'Fisheries Management in Estuarine and Coastal Waters', in Lancaster University, Lancaster, UK
18. **Winfield, I. J.** et al (2018) *Managing competing stakeholder expectations involving the native Mediterranean killifish (*Aphanius fasciatus*) and introduced fish species in the poikilohaline environment of the Akrotiri Peninsula, Cyprus* at the Symposium on 'Competing Mandate of Managing for Introduced Fishes' within the Annual Meeting of the American Fisheries Society, Atlantic City, NJ, USA
19. **Peyton J.** et al (2018) Horizon Scanning for Invasive Alien Species in Overseas Territories in Cyprus, also presented at IOBC in the Azores and Neobiota in Dublin.
20. **Peyton J.** et al (2019) Reviewing the RIS-Ký project. ALIEN CSI COST Action Meeting, 25<sup>th</sup> February 2019
21. **Roy, H.E.** (2019) Contribution of citizen science towards biodiversity monitoring. DITO Biodiversa Conference, Brussels, 2 April 2019.
22. **Roy, H.E.** (2019) Bridging the researcher-communicator gap: sharing perspectives from citizen science based ecological research and engagement. Changing Minds: Data Stories, Bristol, 3 June 2019. Invited Speaker
23. **Roy, H.E.** (2019) Unravelling the ecology of non-native species in Britain and beyond. Swedish Biodiversity Information Centre Conference, 10 April 2019. Plenary speaker

Finally, we are delighted that our project was recently mentioned in the statement for the Certificate of Commendation awarded to JSHU by the Commander Joint Forces Command, General Patrick Sanders.

The Darwin logo was present on all of the above presentations and also outreach materials such as information leaflets, posters, mini-guides and workshops (links to these resources can be found [here](#)).

It was a standalone project but the outputs relevant to the whole of Cyprus and the majority of the methodologies also appropriate for use on other SBAs.

The project team have worked alongside staff from the SBA, military personnel and Cypriot NGOs, such as Terra Cypria, Academics and Government (Ministry of Environment and Water Development Departments) to deliver the project, therefore the Darwin Initiative has been widely promoted to these audiences. The workshops were inclusive to a wide range of stakeholders, with excellent attendance throughout. Workshops were held at the AEEC in Akrotiri, with support from the SBA, in order to highlight the work being undertaken on the SBAs through the AEEC and this current project.

## 7 Finance and administration

This section seeks information about the finances of your project **since your last annual report**. Please amend the financial years in the tables to suit the reporting period and add/remove rows



in the sub-tables if necessary. If all receipts have not yet been received, please provide indicative figures and clearly mark them as Draft. The Final claim form will be taken as the final accounting for funds.

## 7.1 Project expenditure

Project (indicative) since last annual report	spent since last	2018/19 Grant (£)	2018/19 Total actual Darwin Costs (£)	Variance %	Comments explain variances)	(please significant
Staff costs						
Consultancy costs						
Overhead Costs						
Travel and subsistence						
Operating Costs						
Capital items						
Others						
Audit costs						
<b>TOTAL</b>						

Staff employed (Name and position)	Cost (£)
Helen Roy - Overall co-ordination of project	
Jodey Peyton - Day to day running of project , organise workshop etc	
Oli Pescott - Survey, data analysis, report writing and training	
Biren Rathwood - Website and online recording support	
Beth Purse - Disease and vector expertise	
Ian Winfield - Survey, data analysis ,report writing and training	
Marc Botham - Citizen Science and entomological expertise	
Owen Mountford - Botanical field work and reporting	

Stefanie Schafer - Citizen Science,public engagement and mosquito surveying	
Monica Demetriou - Surveys,Identification.GIS analysis	
Giorgos Fyttis - Surveys and Data analysis,report writing	
Yianna Samuel - Report Writing	
Pantelis Savvides - Surveys and Data analysis	
Andreas Dimitriou - Data analysis and report writing	
<b>TOTAL</b>	

<b>Consultancy – description and breakdown of costs</b>	<b>Other items – cost (£)</b>
<b>TOTAL</b>	

<b>Capital items – description</b>	<b>Capital items – cost (£)</b>
Survey equipment (such as data loggers, tablets, books, salinity probes etc.)	
open access charges	
<b>TOTAL</b>	

<b>Other items – description</b>	<b>Other items – cost (£)</b>
<b>TOTAL</b>	

## 7.2 Additional funds or in-kind contributions secured

<b>Source of funding for project lifetime</b>	<b>Total (£)</b>
The international importance of the work we undertook throughout this project resulted in (estimated) 'in-kind' time from experts approximately equivalent to the figure opposite based on an assumed charge cost of £400/day for the three workshops (although many of the participants would have charge out rates	

higher than this), for a total of 7 days workshop with over participants across all three workshops.	
CEH (in kind, plus reduced overhead costs)	
JSHU	
AEEC (estimated savings from venue costs) for 7 days of workshops and meetings over a two year period), plus staff time	
<b>TOTAL</b>	

<b>Source of funding for additional work after project lifetime</b>	<b>Total (£)</b>
2 X IPCOs mosquito surveys	
2 X IPCOS fish surveys	
Entomology staff	
<b>TOTAL</b>	

### 7.3 Value for Money

Our project achieved value for money through a variety of mechanisms. Working with volunteers and within existing structures (e.g. the AEEC, the military Sub-Aqua club etc.) enabled the rapid and efficient dissemination and sharing of information. All project partners work as part of international teams and as such, are well placed to call upon expertise from across the region and wider UKOTs and European network. International recognition of the project was also achieved through two large European networks for scientists' cooperation CA 17122 and CA17508 on Alien Species and Aedes Invasive mosquitoes respectively.

Due to recognition of the importance of the work undertaken through the project, the partner organisations (CEH and JSHU) gave in-kind funding to the project to the value of £115K.

In terms of dissemination and web platforms, the project has utilised existing web infrastructure (GBIF, iNaturalist, EIDC, the Catalogue of Life), rather than creating new mechanisms for mobilising data (particularly when designing CyDAS, running our BioBlitz, and disseminating data and reports).

The project team throughout the project were very keen to ensure that outputs and results were shared widely and thus disseminated all outputs and events through multiple media platforms eg Twitter or Facebook as well as through blogs and news items on the project website.

In order to ensure replicability of methods across different potential user groups, when processing data, open source software (R, QGIS) were used where possible.

Finally, to reduce our carbon footprint and expenditure on travel and subsistence, we, where possible, integrated outreach events and project stakeholder meetings with workshops.

The total of the project came in £692.95 under budget.

**Annex 1 Project’s full current logframe as presented in the application form (unless changes have been agreed)**

Please insert your project’s logframe (if your project has a logframe), including indicators, means of verification and assumptions. 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](mailto:Darwin-Projects@ltsi.co.uk) if you have any questions regarding this.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Impact:</b> Assessment of IAS and capacity building in OTs in Cyprus to facilitate sustainable monitoring and future assessment in order to minimise detrimental impacts on human health, biodiversity and ecosystems.</p>			
<p><b>Outcome:</b> (Max 30 words) Sustainable surveillance of current and potential future IAS in OTs in Cyprus, supported by local organisations and stakeholders, founded on a robust and open evidence base.</p>	<p>0.1 Horizon-scan and IAS of concern for Akrotiri OT and other OTs in Cyprus completed and accepted by community of stakeholders [Dec 2018].</p> <p>0.2 Inventory of IAS for Akrotiri OT that is the result of a set of documented search strategies [Jan 2019].</p>	<p>0.1 Horizon scan workshop completed successfully, with attendance from local and regional experts and stakeholders. Reports produced and scan results published in journal.</p> <p>0.2 Inventory published on website and in open access biodiversity journal.</p>	<p>0.1 Predicted effort sufficient to complete survey. Survey strategy approved by stakeholders.</p> <p>0.2 Stakeholders interested in contributing.</p>

Project summary	Measurable Indicators	Means of verification	Important Assumptions
	<p>0.3 IAS surveillance strategy produced and accepted by community of stakeholders [May 2018].</p> <p>0.4 Training and capacity building workshops increase awareness of IAS, promote the evidence-based approach to surveillance and management, and change behaviours and attitudes towards IAS [Mar 2019].</p> <p>0.5 Project clearly documented, providing model example for other OTs and territories developing strategies for prioritising effort in matters concerning IAS surveillance and management [Mar 2019 – papers from here onward].</p>	<p>0.3 Clear strategy produced based on outputs from horizon scan workshop and field surveys; contribution of stakeholders recognised through horizon scan collaborative process, and stakeholders are invited to co-author paper. Strategy begins to be implemented by the end of the project.</p> <p>0.4 Workshops and all meetings occur and are reported on; stakeholders feed-back on reports, both by co-authorship, and by comments on website. Feedback questionnaires also distributed during workshops to document satisfaction.</p> <p>0.5 Reports and meeting minutes clearly documented and available on project website. Papers published on topics detailed elsewhere in this table.</p>	<p>0.3 Stakeholders approve of methods, accept evidence, and implement the strategy.</p> <p>0.4 Stakeholders engage in project throughout its lifespan.</p> <p>0.5 Data are collected according to scientific standards, and are therefore worthy of publication in learned journals.</p>

<b>Project summary</b>	<b>Measurable Indicators</b>	<b>Means of verification</b>	<b>Important Assumptions</b>
<b>Outputs:</b> <b>1. Horizon-scanning and IAS of concern listed for Akrotiri OT and other OTs in Cyprus</b>	1.1 List of IAS developed and agreed (Horizon scanning workshop) [May 2017].  1.2 IAS list prioritised for monitoring and remedial action (workshop and follow on discussions) [May 2017].	1.1 Workshop report and horizon scanning publication.  1.2 List of IAS prioritised for monitoring and remedial action (workshop and follow on discussions). List hosted on project website and in reports.	1.1 Stakeholders interested in attending.  1.3 Prioritisation process has support from stakeholders.
<b>2. Targeted mapping of IAS for Akrotiri and other OTs in Cyprus</b>	2.1 Mapping of at least 10 IAS [Aug 2018].  2.2 Completed vegetation and habitat mapping of Akrotiri and other OTs in Cyprus, where resources allow, with overlay of IAS occurrence [June 2018].	2.1 Maps available hosted on project website and in reports.  2.2 Available on project website and in reports.	2.1 Surveys completed in timely fashion. Effort adequate for mapping of 10 species.  2.2 Required effort sufficient for completing task.
<b>3. IAS surveillance strategy developed with target audience</b>	3.1 On-line recording being undertaken (focused on at least 10 priority IAS) [Mar 2019].	3.1 Website operational and functions as expected.	3.1 Stakeholders find the website useful.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
	3.2 Design of locally implementable field-based strategy for Akrotiri and other OTs finished [May 2017].	3.2 Evidence-based field-based strategy available on website, and published if appropriate.	3.2 Resulting strategy has support from stakeholders.
<b>4. Training and capacity building provided for OT government staff on the identification and management of IAS</b>	<p>4.1 Project start-up meeting and scoping survey finalise precise scope of subsequent workshops and surveys [April 2017].</p> <p>4.2 Pre-survey workshop and training event occurs [April - June 2017].</p> <p>4.3 Capacity building, through events at JSHU and the Akrotiri Environment Centre, webinars, information leaflets etc. [until Mar 2019].</p> <p>4.4 Year 2 training workshops building on survey and biosecurity issues highlighted in Year 1 [May 2018].</p>	<p>4.1 Report on start-up meeting on website.</p> <p>4.2 Workshop report and feedback forms.</p> <p>4.3 Details of events on project websites and social media announcements and through posters at JSHU and Akrotiri Environment Centre.</p> <p>4.4 Training workshops take place; reports on website and feedback gathered.</p>	<p>4.1 Stakeholders interested in attending. Scoping confirms access and practicality. Scoping inform the risk assessments.</p> <p>4.2 Stakeholders interested in attending. Trainers are adequately briefed. Relevant risk assessments conducted.</p> <p>4.3 Stakeholders interested in attending training sessions; relevant expertise available to provide workshops.</p> <p>4.4 Stakeholders interested in attending. Stakeholders support prioritisation decisions. Year 1 surveys yield sufficient data to prioritise Year 2 efforts.</p>

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<b>5. Effective project management and reporting</b>	5.1 Teleconference to assess year 1 and set up for year 2 [Oct 2017]. 5.2 Progress teleconference meetings [Quarterly to Dec 2018]. 5.3 Annual Report [Mar 2018]. 5.4 Half year report [Oct 2017, Oct 2018]. 5.5 Project closure meeting [Feb 2019]. 5.6 Final report [Mar 2019]. 5.7 Publications [from April 2019].	5.1 Minutes of meeting available on project website. 5.2 Teleconferences minuted as appropriate. 5.3 Annual Report available on website. 5.4 Half year report available on website. 5.5 Minutes of meeting available on project website. 5.6 Final report available on website. 5.7 Publications available on journal websites, preferably open access.	5 Work is high-enough quality and sufficiently novel to merit publication in peer-reviewed literature



**Annex 2 Report of progress and achievements against final project logframe for the life of the project.**

Project summary	Measurable Indicators	Progress and Achievements for the life of the project
<p><b>Impact:</b> Assessment of IAS and capacity building in OTs in Cyprus to facilitate sustainable monitoring and future assessment in order to minimise detrimental impacts on human health, biodiversity and ecosystems.</p>		<p>Positive impacts on biodiversity should result from our project in the following ways: (i) the published expert-led consensus list of future IAS resulting from the horizon scan should promote targeted surveillance and invasion pathway action planning resulting in a reduced likelihood of future IAS arrival and spread. An indirect result of this should be reduced impacts on native biodiversity. (ii) in a similar way, increased knowledge of IAS already present on the SBAs should inform surveillance, management of IAS, and restoration of native communities; (iii) training and capacity building workshops should have increased the capacity of local stakeholders (the military, the AEEC, the SBAA and the Republic of Cyprus government, to identify and respond to IAS impacts; (iv) work with the public through our outreach events and media coverage has hopefully resulted in a greater knowledge of and pride in local native biodiversity, the identity of IAS already present, and an appreciation of all citizen's responsibilities around the introduction and spread of all IAS.</p>
<p><b>Outcome:</b> Sustainable surveillance of current and potential future IAS in OTs in Cyprus, supported by local organisations and stakeholders,</p>	<p>0.1 Horizon-scan and IAS of concern for Akrotiri OT and other OTs in Cyprus completed and accepted by community of stakeholders [Dec 2018].</p> <p>0.2 Inventory of IAS for Akrotiri OT that is the result of a set of</p>	<p>All the fundamental elements of our envisaged sustainable surveillance strategy are complete and in place. All underpinning activities have taken place (e.g. workshops, surveys etc.), but some additional activity outputs are still in the process of being released (largely due to the desire to publish all outputs in peer-reviewed journals and data papers, and the lag that this entails). These outcomes are supported by the output indicators and completed activities described below. For example, the Horizon Scan is published in an open access journal, and was the outcome of an inclusive, consensus workshop. Data collected by ourselves are now becoming available on open platforms</p>

<p>founded on a robust and open evidence base.</p>	<p>documented search strategies [Jan 2019].</p> <p>0.3 IAS surveillance strategy produced and accepted by community of stakeholders [May 2018].</p> <p>0.4 Training and capacity building workshops increase awareness of IAS, promote the evidence-based approach to surveillance and management, and change behaviours and attitudes towards IAS [Mar 2019].</p> <p>0.5 Project clearly documented, providing model example for other OTs and territories developing strategies for prioritising effort in matters concerning IAS surveillance and management [Mar 2019 – papers from here onward].</p>	<p>(the NERC EIDC, GBIF, CyDAS), and we have promoted these many times to local stakeholders (e.g. see various talks at <a href="http://www.ris-ky.eu/resources">http://www.ris-ky.eu/resources</a>).</p>
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<b>Outputs:</b> <b>1. Horizon-scanning and IAS of concern listed for Akrotiri OT and other OTs in Cyprus</b>	1.1 List of IAS developed and agreed (Horizon scanning workshop) [May 2017]. 1.2 IAS list prioritised for monitoring and remedial action (workshop and follow on discussions) [May 2017].	List agreed during workshop, for which the results are now published (see activity 1.1). IAS for following on monitoring were agreed during this workshop and subsequent discussions amongst the project team and many local stakeholders, and resulted in the activities and outputs reported under Output 2 below (and section 3.1 in report).
<b>Activities 1.1 Horizon scanning workshop, including identification of local and regional experts to invite</b>	Completed in April 2017. The results published open access in the journal <i>Biological Invasions</i> (see section 6 in report and annex 4).	
<b>1.2 IAS list prioritised for monitoring and remedial action – combined result of workshop and field survey evidence</b>	This activity directly fed into Output 2 below, the IAS that were subject to targeted monitoring and mapping throughout the SBA.	
<b>2. Targeted mapping of IAS for Akrotiri and other OTs in Cyprus</b>	2.1 Mapping of at least 10 IAS [Aug 2018]. 2.2 Completed vegetation and habitat mapping of Akrotiri and other OTs in Cyprus, where resources allow, with overlay of IAS occurrence [June 2018].	All records collected from the aquatic surveys (marine and terrestrial) are published on the <a href="#">NERC Environmental Information Data Centre</a> . Plant species occurrence data will be uploaded directly to the <a href="#">Global Biodiversity Information Facility</a> to ensure maximum availability and reuse (in prep.). These resources are all, or will be, open access and the data are therefore able to be utilised by anyone working or reporting on the status or condition of species and habitats in the SBAs. IAS stand (vegetation) mapping has also been <a href="#">published on the EIDC</a> (Oct. 2017), and other vegetation occurrence (over 500 species occurrence records collected in March 2018) and quadrat (plot) data for 102 invaded and uninvaded paired plots (1660 additional species records collected in March 2019) are currently being prepared for GBIF, with a journal and data papers to follow (in prep.).

**Activities 2.1 Comprehensive mapping of at least 10 IAS**

The project has far exceeded this initial mapping estimate as documented below:

**Fish:** Between 26 February 2018 and 25th January a total of 89 fish monitoring events were carried out. This resulted in the sampling of 2,898 native *Aphanius fasciatus* specimens, ranging between 5 and 56 mm in length; and, 4,524 non-native *Gambusia holbrooki* fish ranging between 4 and 55 mm in length. All but 8 of the *Aphanius* were recorded in pools, while all of the *Gambusia* were recorded in channels. The fish and environmental data provides a robust baseline against which future changes in *Aphanius* and *Gambusia* population biology and aspects of their abiotic environments can now be compared. Changes in the fish populations which could be assessed in this way include distribution, such as the current persistence of *Aphanius* in a channel site at very low numbers, local abundances of both *Aphanius* and *Gambusia*, and the reproductive activities of both *Aphanius* and *Gambusia* as evidenced by their changing size structures. The environmental observations at one of the channel sites facilitates the assessment of any future changes in temperature, dissolved oxygen and conductivity which may occur as a result of proposed development activities in the local area. See this [link](#) to the open access data.

**Plants:** The locations of over 500 occurrences of plant IAS were generated from a two-week field campaign (spring 2018) reported in the 1st end of year report (see section 3.1); stand mapping of woody IAS has already been published in the NERC Environmental Information Data Centre, linked through the RIS-Ký website [resources](#) page. The plant surveys also informed the development of the citizen science initiative for monitoring pollinating insects described below. One-hundred and two vegetation quadrats (plots) in invaded and uninvaded stands were recorded in spring 2019, and these are currently being prepared for publication (both as data and as a journal paper).

**Marine:** Nine surveys were carried out, in Akrotiri and Dhekelia since the project inception, with 31 occurrences of marine IAS being recorded. The methodology created by the marine team is based on established protocols and modified to be easily implemented by volunteers as well. See this [link](#) to the open access data collected to date.

**Invertebrates:** Pollinators – pollinator data was collected using Cypriot-specific modifications to the UK Pollinator Monitoring Scheme (PoMS) – Flower Insect

	<p>Timed (FIT) Counts. 103 records of pollinating insects have been collected during the project duration by CEH ecologists, alongside two training events with AEEC staff. <u>Mosquito</u> surveys have been undertaken every two weeks at points of entry within the western SBA based on recommendations by the European Centre for Disease Prevention and Control using BG sentinel traps with Biogents lure (surveillance recognised officially at the EU-level <a href="#">here</a>). No IAS mosquito species were recorded during the surveillance studies.</p>
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<p><b>2.2 Vegetation and habitat mapping of Akrotiri and other OTs in Cyprus, where resources allow, with overlay of IAS occurrence from 2.1 and 2.2</b></p>	<p>During the spring of 2018 the botanical team completed extensive mapping of around 2200 occurrences of over 500 invasive alien plant species around the West Sovereign Base Area of Akrotiri and Episkopi and around Dhekelia in the East Sovereign Bay Area (see Fig. 3 in the main report). Five species that are apparently new to the flora of Cyprus, and have the potential to become invasive, were recorded in non-cultivated situations during these surveys (these being <i>Chasmanthe aethiopica</i>, <i>Freesia leichtlinii</i>, <i>Tamarix aphylla</i>, <i>Pennisetum purpureum</i> and <i>Polygala myrtifolia</i>). A different approach was taken in the spring of 2019, where targeted quadrats were recorded in paired invaded and uninvaded stands of vegetation. One-hundred and two such quadrats were recorded, resulting in 1660 species occurrences records. These data will be deposited directly on GBIF; given the volume of information collected compared to the other taxon groups, publishing on GBIF is preferred to the EIDC, as the species occurrence data are directly available as a part of the data resource for Cyprus (and indeed Europe and the world!), without additional collation. These data will be published alongside journal articles that are currently in preparation.</p>
<p><b>3. IAS surveillance strategy developed with target audience</b></p>	<p>3.1 On-line recording being undertaken (focused on at least 10 priority IAS) [Mar 2019].</p> <p>3.2 Design of locally implementable field-based strategy for Akrotiri and other OTs finished [May 2017].</p> <p>Our recording strategies have varied depending on the stakeholder audience and task objectives. Online recording has specifically been used in the BioBlitz (iNaturalist, see report section 3.1 and <a href="#">here</a>) and for the pollinator monitoring project PoMS-Ky (see below and report section 3.1). Project member survey data have typically collected through customised forms and have been subsequently processed for online release through the EIDC or GBIF (iNaturalist data appear on GBIF if of “Research Grade”). Ultimately we have worked closely with the JSHU, SBAA, Cypriot Government and AEEC to ensure we developed protocols (see annex 6 SM 5) and data entry methods that were practical and sufficient to deliver the project outputs. Note that collected data appearing on GBIF are then visible on the species’ maps within the CyDAS checklist.</p>

<p><b>Activities 3.1 On-line recording website established as part of project website (focussed on at least 10 priority IAS)</b></p>	<p><b>PoMS-Ký</b> – Online recording of 103 records from 10 taxonomic groups had been undertaken and entered to the project specific database. The taxonomic resolution is broad as this methodology is aimed at abundance of key pollinator groups, such as honeybees and solitary bees and aimed to be suitable for all skill ranges. Ten taxonomic categories are listed (see annex 6 Supplementary Materials for information on this online recording system).</p> <p><b>iNaturalist BioBlitz</b> – The BioBlitz is <a href="#">now complete</a>, but the event has trained around 20 citizen scientists at Akrotiri in this use of this website and its associated app. Promoting sustainable online recording in this way will continue under our new DarwinPlus project DPlus088.</p> <p><b>CyDAS</b> – This database is published on our project website (<a href="http://www.ris-ky.eu/cydas">http://www.ris-ky.eu/cydas</a>) and also through the Global Register of Introduced and Invasive Species (GRIIS). These data were originally collected as part of Dr Martinou’s EU COST Action Short Term Scientific mission but our project has enabled the database information to be reformatted, expanded and mobilised for public use. It will be maintained beyond the project end, via curators from CEH, UCY and JSHU. CyDAS contains over 625 species records for terrestrial and marine alien species on Cyprus, it also contains embedded GBIF maps, meaning that our open access data on GBIF feed back to this checklist resource.</p>
<p><b>3.2 Design of locally implementable field-based monitoring strategy for Akrotiri and other OTs, based on lists and evidence from 1.1, 1.2, 2.1, 2.2 and 2.3</b></p>	<p>Our monitoring strategies emerged from other strands of the project as indicated, and are detailed in Annex 6, SM 1. The data resulting from these efforts are described in report section 3.1, and also above under activity 2.1.</p>
<p><b>4. Training and capacity building provided for OT government staff on the identification and</b></p>	<p>4.1 Project start-up meeting and scoping survey to finalise the precise scope of subsequent workshops and surveys [April 2017].</p> <p>All output indicators were met, and both staff affiliated with stakeholders (e.g. JSHU and AEEC staff), government personnel, international and regional experts on IAS and wetland management, local citizens, schoolchildren and local educators were all engaged across the numerous outreach and training events that took place. The project ran three well-attended workshops involving academics, government representatives, citizen scientists and educators from throughout Cyprus and the Levant, produced several species identification and</p>

<p><b>management of IAS</b></p>	<p>4.2 Pre-survey workshop and training event occurs [April - June 2017].</p> <p>4.3 Capacity building, through events at JSU and the Akrotiri Environment Centre, webinars, information leaflets etc. [until Mar 2019].</p> <p>4.4 Year 2 training workshops building on survey and biosecurity issues highlighted in Year 1 [May 2018].</p>	<p>awareness raising resources on a variety of IAS (in both Greek and English). The project also invited local schools and University of the 3rd Age members to the AEEC, enabling academics involved in RIS-Ký to communicate their work to local children and teachers. The project also developed teaching resources centered around IAS and pollinators in collaboration with environmental educators based at AEEC. Finally, the project also worked with “citizen scientists” to collect monitoring data on both terrestrial and marine habitats around the Akrotiri peninsula.</p>
<p><b>Activities 4.1 Project start-up meeting and scoping survey finalise precise scope of subsequent workshops and surveys [April 2017]</b></p>		<p>The team had regular Skype and face-to-face meetings and were regularly in contact through email and Skype. The core project team also kept in regular email contact.</p>
<p><b>4.2 Pre-survey workshop and training event occurs [April - June 2017]</b></p>		<p>Our training events were aligned with workshops and the marine and terrestrial invertebrates team undertook training with volunteers throughout the project. UCY made regular contact with local divers, who expressed an interest in participating in the surveys. At least five volunteers successfully participated in surveys. AEEC staff also received training in fish identification and survey techniques, participating regularly in the capture and measurement of both native <i>Aphanius</i> and non-native <i>Gambusia</i> species; these staff are included as authors on the fish dataset now available through the NERC EIDC. Training was also provided to the ~20 citizen scientists who attended the BioBlitz in spring 2019; this training covered species ID, but also the general approaches of biological recording, and tools such as the iNaturalist app (see section 3.1 for more detail).</p>



**4.3 Capacity building [until Mar 2019]. Local staff trained in identification and management of IAS using workshops and online resources. Methods and database/resource structures comprehensively documented to facilitate knowledge transfer.**

The project ran a specific one day [capacity building workshop](#) in August 2017 at the AEEC which included talks by British and Cypriot natural historians and staff on monitoring and surveillance led by volunteers and NGOs, government and academia. Please see annex 6 Supplementary Materials for the programme for this workshop.

**Pollinating insects** - The project team developed PoMS-Ký, a standardised pollinator monitoring scheme, designed in the UK and modified for suitability in Cyprus, using Cypriot plant and pollinator species. This scheme was designed to engage school children and adults in recording wildlife and understanding the importance of pollinating insects in the context of food production and the economy. It highlights differences in visitation rates between native and non-native plant species, thus also raising awareness of the potential impacts of non-native species. The intention is to combine the surveys with lessons at the AEEC and generate a module around IAS and pollinators. The CEH team worked with a Hymenoptera expert from the UK, Cypriot PhD entomology students and staff at the AEEC to develop the protocol and also design a new subset of the work designed specifically at young children, Mini-PoMS-Ký.

**Human health and mosquitoes** - The team ran the Native and non-native vector management in the Eastern Mediterranean and the Middle East (EMME) Workshop at the AEEC 18th-20th April 2018. See annex 6 Supplementary Materials for the programme for the workshop. International and Cypriot experts in conservation and mosquito management were invited, as well as stakeholders from British Forces and SBAs. Discussions centred around native and non-native mosquito management methods with the aim of devising a common protocol that would be applicable to a wetland of international importance such as Akrotiri. but also in other European wetlands (now submitted for publication, see sections 6 and annex 4 of the report). Over 40 people attended the workshop. As well as hosting the workshop on vectors and management, we also undertook a survey of around 150 local residents to establish the general attitudes to wetlands, mosquitoes and thoughts around non-native mosquito species. All the presentations are listed here, on the project website. See annex 6 Supplementary Materials for the Mosquito outreach flier created as part of the workshop and designed to demonstrate how it is possible to take simple measures to reduce breeding areas for

	<p>mosquitoes, as well as educate around mosquito life-cycles. The leaflet is available in English and Greek. A manuscript is in preparation presenting a code of practice for mosquito management in wetlands.</p> <p><b>Marine</b> - A training presentation took place at the Sub-aqua Club to inform local divers on the data collection methods. Posters have been prepared with information on alien fish and jellyfish that can be encountered in the waters of Cyprus and disseminated to the stakeholders (see Annex 6 for poster).</p>
<p><b>4.4 Year 2 training workshops</b></p>	<p><b>Biosecurity</b> – the EMME workshop (see above) had a large element of improving biosecurity and the mosquito outreach flier also indicated biosecurity measures that can be implemented to reduce breeding habitat for mosquitoes.</p> <p><b>Marine</b> - UCY worked with local SBA divers, who expressed an interest in participating in the surveys and the transect locations are georeferenced ready for continued uptake as capacity allows.</p> <p><b>Invertebrates</b> - The project team continued to deliver <a href="#">PoMS-Ký</a> training to staff at the AEEC, and through the spring 2019 BioBlitz.</p>
<p><b>5. Effective project management and reporting</b></p>	<p>5.1 Teleconference to assess year 1 and set up for year 2 [Oct 2017].</p> <p>5.2 Progress teleconference meetings [Quarterly to Dec 2018].</p> <p>5.3 Annual Report [Mar 2018].</p> <p>5.4 Half year report [Oct 2017, Oct 2018].</p> <p>5.5 Project closure meeting [Feb 2019].</p> <p>5.6 Final report [Mar 2019].</p> <p>5.7 Publications [from April 2019].</p> <p>These indicators were useful for tracking our progress and documenting our project management. All meetings were documented, and minutes and agendas are available on request. Papers and dataset publications have been continuously produced throughout the project, and this is planned to continue until all outputs are published in an open access format.</p>

<b>Activities 5.1 Teleconference to assess year 1 and set up for year 2</b>	Complete and meetings documented.
<b>5.2 Progress teleconference meetings</b>	Complete and meetings documented.
<b>5.3 Report writing (links to outputs 5.3, 5.4 and 5.6 above)</b>	5.3 Complete A1 and sent to Darwin. 5.4 Complete HY1, HY2 and sent to Darwin. 5.6 This report.
<b>5.5 Project closure meeting [Feb 2019]</b>	Complete 1 <sup>st</sup> March 2019 at the AEEC and summaries of results given to small team of stakeholders including Cypriot Government, NGOs and military.
<b>5.7 Publications produced</b>	See main report (sections 6 and annex 4, as well as the website, for lists of publications and datasets to date). A manuscript for a Code of Practice for mosquito management in wetlands has also been submitted to <i>Journal of Applied Ecology</i> , and additional papers and datasets are planned to follow.

## Annex 3 Standard Measures

The Standard Measures represent a 25 year dataset of brief statistics of Darwin Projects. They largely comprise a series of Inputs, Activities and Outputs or deliverables. Projects are not evaluated according to quantity of Standard Measures and completing Annex 1 is optional, but collecting information on these Measures are still useful for Defra. Projects that report few standard measures are not seen as being of poorer quality than those projects which can report against multiple standard measures.

Please quantify and briefly describe all project standard measures using the coding and format of the Darwin Initiative Standard Measures. Download the updated list explaining standard measures from <http://www.darwininitiative.org.uk/resources-for-projects/reporting-forms>. If any sections are not relevant, please leave blank.

Code	Description	Totals (plus additional detail as required)
<b>Training Measures</b>		
1	Number of (i) students from the UKOTs; and (ii) other students to receive training (including PhD, masters and other training and receiving a qualification or certificate)	i) 0 ii) 2
2	Number of (i) people in UKOTs; and (ii) other people receiving other forms of long-term (>1yr) training not leading to formal qualification	0
3a	Number of (i) people in UKOTs; and (ii) other people receiving other forms of short-term education/training (i.e. not categories 1-5 above)	i) 2
3b	Number of training weeks (i) in UKOTs; (ii) outside UKOTs not leading to formal qualification	0
4	Number of types of training materials produced. Were these materials made available for use by UKOTs?	3 - guides, fliers and protocols <a href="#">Invasive species mini-guide</a> (English) <a href="#">Invasive species mini-guide</a> (Greek) <a href="#">Learn your invasive mosquitoes!</a> (English, poster) <a href="#">Mosquito information leaflet for Cyprus</a> (English, normal format) <a href="#">Mosquito information leaflet for Cyprus</a> (English, folded flyer format) <a href="#">Mosquito information leaflet for Cyprus</a> (Greek, normal format) <a href="#">Mosquito information leaflet for Cyprus</a> (Greek, folded flyer format) <a href="#">Invasive marine species</a> (English, poster)

5	Number of UKOT citizens who have increased capacity to manage natural resources as a result of the project	3 received specific training, but workshops reached local audiences of around 20
<b>Research Measures</b>		
9	Number of species/habitat management plans/ strategies (or action plans) produced for/by Governments, public authorities or other implementing agencies in the UKOTs	1
10	Number of formal documents produced to assist work in UKOTs related to species identification, classification and recording.	6 (see <a href="http://www.ris-ky.eu/resources">http://www.ris-ky.eu/resources</a> 'Outreach materials', in Greek and English)
11a	Number of papers published or accepted for publication in peer reviewed journals written by (i) UKOT authors; and (ii) other authors	i) 1 in draft ii) 3 published
11b	Number of papers published or accepted for publication elsewhere written by (i) UKOT authors; and (ii) other authors	0
12b	Number of computer-based databases enhanced (containing species/genetic information). Were these databases made available for use by UKOTs?	3 (CyDAS, GBIF, iNaturalist) Yes
13a	Number of species reference collections established. Were these collections handed over to UKOTs?	0
13b	Number of species reference collections enhanced. Were these collections handed over to UKOTs?	0
<b>Dissemination Measures</b>		
14a	Number of conferences/seminars/workshops/stakeholder meetings organised to present/disseminate findings from UKOT's Darwin project work	2
14b	Number of conferences/seminars/workshops/stakeholder meetings attended at which findings from the Darwin Plus project work will be presented/ disseminated	23
<b>Physical Measures</b>		
20	Estimated value (£s) of physical assets handed over to UKOT(s)	
21	Number of permanent educational/training/research facilities or organisation established in UKOTs	0

22	Number of permanent field plots established in UKOTs	16: Five mosquito sampling points, eight terrestrial fish locations, three marine transects
23	Value of resources raised from other sources (e.g., in addition to Darwin funding) for project work	0

## Annex 4 Publications

Provide full details of all publications and material that can be publicly accessed, e.g. title, name of publisher, contact details. Mark (\*) all publications and other material that you have included with this report

Resources listed throughout the report are available [here](#) through the project website

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Nationality of lead author(s)	Nationality of institution of lead author	Gender of lead author	Publishers (name, city)	Available from (e.g. weblink, contact address, annex etc)
Peer-reviewed paper	Developing a Code of Practice for mosquito management in European wetlands. (Submitted). Martinou, Angeliki F; Roy, Helen; Wright, Denis; Peyton, Jodey; Ferraguti, Martina; Schafer, Stephanie; Bueo, Ruben	Greek	UKOT	Female	<i>In review</i> - Journal of Applied Ecology	
open access Dataset	Pescott, O., Peyton, J., Mountford, J., Onete, M., Martinou, A. (2017). Non-native plant species GIS data from Cyprus Sovereign Base Areas, October 2015 and March 2017.	British	British	Male	NERC Environmental Information Data Centre. <a href="http://doi.org/10.5285/7c84e06d-bb1a-4aac-b1d7-33c11310d8a0">http://doi.org/10.5285/7c84e06d-bb1a-4aac-b1d7-33c11310d8a0</a> mation Da	

Peer-reviewed paper	Horizon scanning for invasive alien species with the potential to threaten biodiversity and human health on a Mediterranean island Peyton et al. 2019. <i>Biol. Invasions</i>	British, Greek	British, UKOT	Both female	Biological Invasions Springer	– <a href="https://link.springer.com/article/10.1007/s10530-019-01961-7">https://link.springer.com/article/10.1007/s10530-019-01961-7</a>
Peer-reviewed book chapter	The forest on the peninsula: Impacts, uses and perceptions of a colonial legacy in Cyprus. Pescott, et al. (2018). In: <i>Histories of Bioinvasions in Mediterranean-type regions</i> A.I. Quieroz and S. Pooley (eds), pp. 195-217	British	British	Male	Springer	<a href="https://www.researchgate.net/publication/325149989_The_Forest_on_the_Peninsula_Impacts_Uses_and_Perceptions_of_a_Colonial_Legacy_in_Cyprus">https://www.researchgate.net/publication/325149989_The_Forest_on_the_Peninsula_Impacts_Uses_and_Perceptions_of_a_Colonial_Legacy_in_Cyprus</a>  <a href="https://www.springer.com/gb/book/9783319749853">https://www.springer.com/gb/book/9783319749853</a>
Peer-reviewed book chapter	From local strategy to global frameworks: effects of invasive non-native species on health and well-being. Martinou, A.F. and Roy, H.E. (2018) <i>Invasive Species and Human Health</i> (Eds: Mazza, G. & Tricarico, E.)	Greek	UKOT	Female	CABI Publishing	



## Annex 5 Darwin Contacts

<b>Ref No</b>	DPLUS056
<b>Project Title</b>	Assessment of current and future Invasive Alien Species in Cyprus
<b>Project Leader Details</b>	
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<b>Partner 2 etc.</b>	
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Organisation	University of Cyprus
Role within Darwin Project	Marine Team Lead
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## Annex 6 Supplementary material (optional but encouraged as evidence of project achievement)

Checklist for submission

	Check
<b>Is the report less than 10MB?</b> If so, please email to <a href="mailto:Darwin-Projects@ltsi.co.uk">Darwin-Projects@ltsi.co.uk</a> putting the project number in the Subject line.	N
<b>Is your report more than 10MB?</b> If so, please discuss with <a href="mailto:Darwin-Projects@ltsi.co.uk">Darwin-Projects@ltsi.co.uk</a> about the best way to deliver the report, putting the project number in the Subject line.	Y
<b>Have you included means of verification?</b> You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	Y
<b>Do you have hard copies of material you want to submit with the report?</b> 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.	N
Have you involved your partners in preparation of the report and named the main contributors	Y
Have you completed the Project Expenditure table fully?	Y
Do not include claim forms or other communications with this report.	