Saving Our Special Nature of Montserrat

Newsletter 5, December 2017

Male Montserrat oriole, Montserrat's national bird on red heliconia, Montserrat's national plant. Photo: Dr Mike Pienkowski

Foreword

Welcome to the fifth issue of the newsletter about the project entitled *Maximising long-term survival prospects of Montserrat's endemic species and ecosystem-services*. This is a good and reasonably concise title for technical use – but is a bit of a mouth-full for everyday use. So we thought that, for the latter, we might try something shorter – but meaning much the same thing, as well as trying to capture also the wider aspects. You see it above. It has not skipped our notice that it does lend itself to an abbreviation relevant to the urgency and importance of the matter: *SOS Nature of Montserrat.*

We are very grateful for the many kind and encouraging comments from people welcoming the first four newsletters. We hope that you enjoy this one too. In it, we highlight the outcome of the series of workshops on the future of the the south. We are delighted too with the starting of more local *Adopt a Home for Wildlife* projects – indeed including some for the south. We include progress reports on some started earlier. We touch on some of the project work, not just in the fourth visit of off-island partners, but also going on all of the time in Montserrat, UK and elsewhere. We had originally planned to publish a newsletter in September. However, Montserrat suffered from preparations for, and impact of, hurricanes, so that much time in Sepember was lost, and some consequences continue. So, again, we have a bumper issue to catch up.

Please feel free to show or forward these newsletters to others. If anyone sees these and would like to be added to the circulation list, please send your email address to cwensink@ukotcf.org.

For more information on the project, the main contacts are:

Dr Mike Pienkowski & Catherine Wensink, UK Overseas Territories Conservation Forum: m@pienkowski.org cwensink@ukotcf.org . See also www.ukotcf.org

Nicolas Tirard & Mrs Sarita Francis, Montserrat National Trust: nicolas.tirard@gmail.com mnatrust@candw.ms

Montserrat stakeholders agree vision for the south of the island

The final workshop of the series of four within the present project, on the future of the south of Montserrat, was held on 10th November. As noted previously, this is one of the components of a project developed by the Government of Montserrat, the UK Overseas Territories Conservation Forum (UKOTCF), and the Montserrat National Trust (MNT), with other partners (see heading above). The project was successful in receiving part-funding from the UK Government's Darwin Initiative programme (Project DPLUS049).

The project is based on the fact that, despite two-thirds of Montserrat being zones of restriction due to volcanic activity, the island remains hugely important for endemic species (*i.e.* those that occur nowhere else in the world). Earlier part-Darwin-funded work focussed on the Centre Hills. This current project takes a strategic view of the whole island – needed to identify and minimise pressures, and to ensure that the natural resources are safeguarded, thereby

Aerial view of Montserrat from the south. Photo: Dr Mike Pienkowski

The workshop in session. Photo: Catherine Wensink

also underpinning economic recovery. The other components of the project are described in other articles in this and previous issues of *SOS Nature of Montserrat*.

The overall objective of the series of workshops is: ***To agree between stakeholders an environmentally sustainable vision for the future management of the south of Montserrat, which commands wide local support, and against which to seek financial support to implement it, after the current project.*** As determined by these stakeholders, the strategic vision will emphasise (but not be limited to) restoration of natural ecosystems. This is because of both their intrinsic importance and their potential value to Montserrat's future economy. This project will not implement the strategy but is aimed at providing a sound basis for seeking the resources to move it forward.

Within this framework, the objectives of this 4th workshop were: *Securing agreement on the vision resulting from the previous workshops and, as far as possible, the outline of funding proposals.*

The project partners and other participants were delighted that both Hon. David Osborne, Minister of Agriculture, Trade, Housing, Land and Environment, and his predecessor, Hon. Claude Hogan MLA (who had long supported the project), both participated in the workshop.

Welcome

Mrs Jean White, on behalf of Montserrat National Trust (MNT), opened the workshop, with a prayer and dedication. She also gave apologies from Mrs Francis, Executive Director, and Mrs Dulcie James, President, who were sorry that they could not attend due to family matters.

An overview of the Darwin Plus project overall

Dr Mike Pienkowski, Chairman of UKOTCF and Project Leader, introduced the workshop, explaining that he and others would give updates on related work, both inside and outside of the current project.

Dr Pienkowski presented a brief overview of the project. The series of workshops considering the future options for the South were one part of a 4-part project. The whole project was an attempt to fill key gaps to maximise the long-term survival of species which occur just in Montserrat, and their benefits to the economy and employment in Montserrat.

One part of the project addresses mechanisms for the best integration of environmental matters into the physical planning process. This had been led by Dr Jo Treweek and Ms Jennifer Hruza of Treweek Environmental Consultants. The project team are interacting with Montserrat ministers and officers to integrate these into procedures.

Another part is to make existing biodiversity information available in Montserrat. This project had begun this process by designing a Montserrat-specific access point, which everybody could use, to access information held in databases in the US, at no cost to Montserrat. The information being made available in the first instance is the beetle information collected by Mike Ivie and his team from Montana State University (MSU). During the project visit in June-July 2017, Mike Ivie and colleagues had come to Montserrat to check how people wanted to use that information, gather further information, and thus create the first module in the Montserrat Virtual Museum of Natural History (MVMNH). With the commencement of this facilty, Montserrat would undoubtedly be envied by other territories. All of this would cost Montserrat nothing, as the database was held on a North American university database funded by an endowment, so ongoing maintenance costs were covered. The MSU team within the project were creating the Montserrat-specific access point, as well as capturing and digitising information gathered in Montserrat over the years by institutions in USA, UK and Canada. This part of the project was concerned also with enthusing people about insects – many of which were endemic to Montserrat, and key food sources for charismatic species, such as the Montserrat oriole and the mountain chicken. As part of Montserrat's important biodiversity, the insects were a key group. Professor Ivie considered it likely that Montserrat had a greater diversity of insect life than Dominica, even though the latter is much larger in size.

A third element of the project is *Adopt a Home for Wildlife*, which is promoting local ownership for the conservation of Montserrat's endemic and native species, the majority of which are under threat. Already, the participation in this project was very encouraging, and increasing. Nicolas Tirard would report on that shortly (and see pages 3 & 11-16).

The fourth element is this series of workshops on the future of the south, of which this was the fourth and final workshop within this project. The workshops had generated discussion and agreement as to what all the stakeholders want to see happening in the south of the island, and this workshop would present the

previously agreed elements for future actions in the south, and gather further thoughts of stakeholders.

Related work: Adopt a Home for Wildlife, as well as related native-plant nursery project

Mr Nicolas Tirard (MNT) reported that this part of the project is a scheme aiming at giving residents of Montserrat the possibility of making their environment friendlier to the local wildlife. The material that he presented is the subject of other articles in this issue of *SOS Nature of Montserrat* (pages 11-16).

Until recently, the *Adopt a Home for Wildlife* sites had all been in the north of the island, but, during the last project visit, Tim Orton added his dry-forest area at Garibaldi Hill, and, a few days earlier during the present project visit, the Cork Hill Reunion Committee 2016 have joined the *Adopt a Home for Wildlife* programme.

Mr Roland Irish, from the Cork Hill Reunion Committee, spoke about the work of this group. The Cork Hill Community has been abandoned for more than 20 years, and invasive species are taking over, for example the blackberry tree (as illustrated by satellite imagery in Workshop 3).

The Cork Hill Reunion Committee team have been working on restoration of Cork Hill for 2 years. To date, they have cleared the overgrown Lansen Park, organised community clear-ups and events, and identified tourism potential. They are planning to restore the former clinic into a tourist / visitor centre with toilet facilities.

Roland Irish (centre) at the workshop. Photo: Catherine Wensink

Other progress in the south

Dr Pienkowski noted that, at the start of this project, it was stated that the project would not actually start doing anything in the south. This is still true of the more remote areas. However, with the quietening of the volcano, and the opening up of the south, work has started at Cork Hill and Garibaldi Hill. Conversations have been had with Mr Isles, now developing at Fox's Bay.

He thanked Mrs Carol Osborne for organising a meeting with the Osborne company directors. This resulted in very helpful and supportive discussions with the Osborne family about the Roche's area, which falls within their estate, and crucial if the work identified by this series of workshops is to be carried forward.

Dr Pienkowski noted that the project and its partners are keen to encourage related work. UKOTCF had earlier introduced the Waitt Institute and Foundation to the Government of Montserrat and facilitated the substantial input by them into marine survey and planning. It had also facilitated the funding by the British Library for the current archive digitization by MNT, as well as many earlier conservation projects. He noted that the EU-funded nursery project would not have happened if Nicolas Tirard had not already been working as project officer for the Darwin Plus project.

Dr Pienkowski said that some of the work JNCC are embarking on here fits very well with the work that UKOTCF and the Montserrat National Trust are doing here. He mentioned that he could, very indirectly, claim some tenuous responsibility because, about 25 years earlier, he had been the UK official given the task of establishing JNCC and had served as its first Director. More to the point, UKOTCF had shared widely the needs identified by the present project. In fact, the body that JNCC had contracted to undertake some of the satellite-image analysis had earlier beem enlisted by UKOTCF to help with the current project. Furthermore, UKOTCF and MNT had responded positively to enquiries from that body and JNCC to advise and help with the work, especially the necessary ground-truthing.

The current JNCC work was not limited to this, and he was pleased to invite Ms Amanda Gregory, from JNCC, to give an overview of their project on Montserrat.

Other work relating to needs identified by the project: habitat mapping (and other work) commissioned by JNCC

Ms Amanda Gregory (JNCC) explained that JNCC is the UK agency charged with advising UK Government on nature conservation matters for UK (as a whole), UKOT and international matters. There is an article about this on page 10.

Nicolas Tirard noted that the previous workshop held for the Darwin Plus project considered the feasibility of access issues to the south to collect data. Currently there is no procedure in Montserrat for obtaining permission, and the authorities with involvement in this (Police, DCMA, MVO) need to clarify what is needed to to apply for and obtain authorisation to access the south. The project partners had drawn this to the attention of the authorities, but it applied equally to the JNCC-commissioned work. Dr Pienkowski remarked that it was pleasing that the two groups were combining work on this aspect where practicable, and that the results would be available to all.

Summary of the work undertaken on this aspect of the project during the preceding 3 workshops

Mrs Catherine Wensink (UKOTCF Executive Director) gave a summary of earlier workshops:

The first workshop, in May 2016, started with the question "Why would it be good to carry out work in the south?" There were quite a few answers to this question, of course, but we were able to group the opportunities into some categories: biodiversity & ecosystem services, heritage sites, research & rediscovery and economic activities.

The second question was concerned with constraints and issues such as access, risk and safety, feral livestock and resources.

James 'Scriber' Daley throughout has uplifted us all with the accounts he has given about what he has seen in the south (bat caves, healthy lignum vitae, orioles), which I am sure he will recall today. We know that the area has been changing over time caused by the presence of invasive species and feral livestock and we have made comparisons (using satellite images) with the heavily eroded Silver Hills, which could be a warning sign to what could happen in the south, if we do not take appropriate action.

The final question asked in that workshop was: "what will happen

Montage of some of the previous workshops during the project (from Catherine Wensink's presentation)

if we do nothing in the south?" Participants discussed how, if nothing was done in the south, the area would become like Silver Hills, or worse, with erosion, a reduced water-capture and increased feral-livestock and invasive-species issues. Taking no action would result in a loss of species biodiversity and missed research and economic opportunities. There was strong belief that the situation in the south could be improved.

For the second workshop, in December 2016, participants were split into groups to focus in further detail on the proposed activities/opportunities suggested in workshop 1. The results of this work are all recorded in the tables and other material in the second workshop report. Some detail on stakeholders, risks, resource constraints were given.

Scriber provided some further information on specific areas of the south, which were changing.

In the third workshop in June this year, some images were presented, which showed some of these changes as seen from analysis of satellite images obtained through a grant from the DigitalGlobe Foundation. These included *e.g.* erosion caused by feral livestock, particularly goats, and invasive plants, *e.g.* blackberry. It was noted that the activities of feral animals tended to aid the plant invasions. We had talked about these images on the radio with Rose Willock while we were here in June and, as a result, we are now fortunately joined by Cork Hill Reunion Committee. [One of the sets of images is reproduced on p. 13, showing the Cork Hill area before the Reunion Committee got to work.] As mentioned earlier, they are interested to find a way to manage vegetation in the area, working with the project and the Trust, as part of *Adopt a Home for Wildlife*.

As previously mentioned, JNCC has recently commissioned Environment Systems to progress the vegetation mapping work with MNT to create a habitat map for the entire island. This was noted early in the project as something which was necessary to update and broaden beyond the Centre Hills and north of the island, since 2007 when the last such mapping was done. This will help in a variety of ways already outlined. We are pleased that Environment Systems (from whom we benefitted from some advice early in the project when we outlined Montserrat and its needs, as well as the high-resolution satellite images we had acquired), working with JNCC, has been able to take this on for us.

We discussed in more detail activities that had previously been suggested for areas in the south that include environment protection, job creation and growth of tourism.

Information and ideas were gathered to help assess their feasibility, taking into account practicalities such as safety, local resources and capacity, demand and funding. This was written in a report, circulated to participants in all workshops and finalised in August.

This now forms the basis of a shared vision about what is possible and how we might get there, as we will discuss shortly.

Explanation of additional input from this workshop

Mrs Ann Pienkowski (UKOTCF) explained the function and purpose of obtaining workshop participants' opinions on the vision for the south generated by the project. In previous workshops, participants had identified important elements for a vision for the south, which would be presented next. This is a consensus view, but different people would have different opinions on the relative importance to themselves of these elements. Knowing these different opinions would aid future planning. On the sheet handed out to each participant, the 11 vision elements which would be highlighted in the following presentation each had an opinion scale next to it. This had 5 positions, going from "Very important to me" to "Less important to me". Participants were asked to mark on the scale their opinion of relative importance to them, either as each element was presented, or at the end. A blank scale at the end was to enable participants to record anything they thought was missing. The analysis of these opinion scales, carried out after workshop, showed that a remarkably high proportion of participants thought that the consensus priorities are important to them too - with all items being considered important personally to at least 70% of participants, and some reaching 100%.

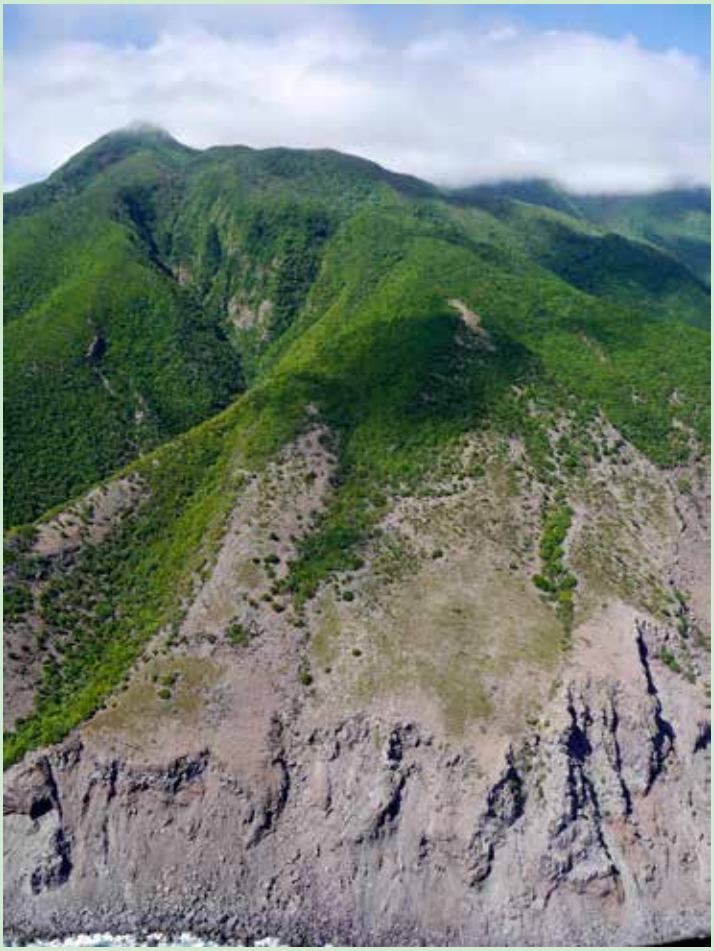
Presentation of *Vision for the future of the south*, resulting from the preceding workshops

Dr Mike Pienkowski took the meeting through a Powerpoint

Helicopter views of the south: (top) the rich forest area at Roche's; (below) area further south showing high erosion and desertification related to feral animal grazing. Photos: Dr Mike Pienkowski (above) & Nicolas Tirard (below)

presentation of the *Vision* from the previous workshops and discussions. The full *Vision* is available on request. However, the 11 elements brought out were:

1. On-island education campaigns to raise public awareness surrounding the different values of native species and invasive species, and the purpose and benefits of habitat restoration, carried out via *e.g.* schools, radio/ newspapers, social media. Development of more work experience and internship programmes.
2. Development of an operating base to facilitate and encourage researchers and students from overseas to carry out environmental & geophysical research projects currently out of the scope/ capabilities of on-island organisations.
3. To enhance food security, some re-establishment of (or use of existing) fruit trees, and more grazing, might be practicable, particularly if these were in areas in which day-time access were possible.
4. Some aspects of the conservation work may lend themselves to conservation-tourism, whereby visitors pay to experience Montserrat but included in their visits is a significant amount of time actually working on the conservation initiatives.
5. Exploring the possibilities for tourists and the local community to land in the south and the opportunity for eco-tourism in the form of tours and trails in the forest that can also encompass built heritage. Obviously, this would need integration, not just with the safety requirements but also with the conservation plans. While there are a number of logistical constraints associated with this idea, such as health and safety permissions from MVO, DCMA and the Police, with the correct procedures in place and sufficient resourcing and management then this could be a viable and profitable option that promotes Montserrat's environment.
6. A strategic environmental assessment to be carried out at the whole-island level, to provide a systematic framework for analysing and assessing the decision-making processes of policies, plans and programmes. This holistic approach is needed to allow consistent and informed decisions to be made relating to sustainable and appropriate land-use across the whole of the island.
7. Robust scientific data on the south (and the north) to be collected and a ground-truthed habitat map to be created for the south of the island (plus any further needed to complement the material that already exists for the north) to allow informed decisions to be made relating to biodiversity conservation.
8. Experts also to be contacted to carry out surveys for important taxa including invertebrates and rare plants.
9. A quantitative assessment to be carried out of the feral animals in the south to inform the development of a new island-wide management/ control plan that also considers the situation in the north in terms of feral animals and current control measures. Investigation of whether, if carried out at the whole island level, the eradication of feral livestock would be possible.
10. The development of a potential land- and sea-use plan for areas in the south, taking into account land ownership rights and consultation with key individuals and organisations with land in the area, including development of proposed terrestrial and marine protected areas under local legislation and with international standing also.
11. The creation of restoration areas – expansion of the *Adopt a Home for Wildlife* scheme into the south of the island, as well as in the north. This could be achieved on varying scales from a large-scale restoration project focusing on



the restoration of native habitats with the provision for eco-tourism in Roche's, to small-scale projects around the periphery of the main exclusion zone for example sustainable farming initiatives.

Participants were given the opportunity to add any points missed, and the comments here generally amplified or reinforced the listed items resulting from the earlier workshops.

Comments from James 'Scriber' Daley (DoE)

Mr Daley then gave further comments on the condition of the south. He highlighted once more the importance of the south, noting important bird areas for Montserrat oriole, forest thrush, the coastal area for Audubon's shearwater, and nesting red-billed tropic birds. The ongoing destruction by invasive species (goats, sheep, donkeys) is threatening these. As mentioned earlier, the south could become an important tourism product, *e.g.* the bamboo forest.

In the previous workshop, he had highlighted the increasing number of feral dogs in the area, due to them being left behind by hunters. These packs of feral dogs can be very dangerous, and there is video evidence of this which can be shared. Previously, these dogs would have been controlled, but it has been realised that the dogs are actually effectively controlling some of the feral animals, killing goats, sheep and young of other species. This is letting some of the vegetation recover. This recovery can be seen on the coast. Eventually the dogs will need controlling but, when the time comes, that will not be a problem. Confirming that the feral dogs had been left behind by hunters, Mr Daley said that it was already illegal to leave dogs behind in the south, and a proper surveillance system was needed.

He noted that there is still a good population of lignum vitae in the south. It would be very good to get that established in the north. It likes a hot habitat, such as in the Silver Hills, and it would do well at Lookout, and other areas where there is not a lot of rainfall. The south is very important as a refuge for species threatened in the north by development, for example one proposed at Little Bay which could affect the population of fruit bats there. This is an important species for Montserrat, and the bat cave near Little Bay is an important tourist attraction site. There has been much discussion about that area, and what should happen to the bats at Little Bay. There is a colony of these bats in the south. Could the north bats be moved there?

A question was asked about the feasibility of using fencing as part of the management of feral animals. Mr Daley said that the best option would be to remove the goats, but in the meantime the dogs were effectively controlling the goats.

Dr Pienkowski noted that consideration of these issues as part of the project discussions was to determine what was needed for a proper review of the current situation, and what is feasible. Calling in international specialists would be important because of both the progress in techniques and changes in volcanic conditions since they were last here.

Mr Daley added that the goats feed on cactus (for water) but, so far, there was no sign of pigs in much of the area – if pigs got into the key areas, that would be a problem, as it was a large area. If goats were removed it would save the cactus, and cactus is an important food source for birds.

Mr Daley noted that studies of beetles had mostly been done in the Centre Hills. The situation could be different in the south, the youngest part of the island, and there had never been proper surveys there, especially in Roche's. Dr Pienkowski said that the team from Montana were very keen to conduct insect surveys in the south, and had made a start in some of the accessible northern parts of this.

Mr Daley noted the number of endemic species – plants and animals – on Montserrat, and thought it would make an interesting study to find out why they were not present on other Antilles islands.

Reflections from Hon. Claude Hogan MLA

Mr Hogan noted to the Minister that this project, is related to other projects covered by UKOTCF, and joked "Mike is like a grandfather of all environmental work on Montserrat." He continued: "This particular project exercise started in 2014. We met in Guadaloupe. Mike spoke to me about it, and I volunteered to be a supporter. Regeneration of the south, fruit trees in Roche's, bananas, etc.; I wanted that as the focal point of restoration. Dr Pienkowski was much more expansive; he brought in how we should strategize through vision the whole of the south of the island. Mike conceived a project which included what I was thinking. This project has a long-term vision for providing work, opportunity, economy for Montserrat. I want to broaden it to say that, during the course of project development, Mike and his colleagues introduced me to Waitt so that we could include the marine side of the environment. So we get a holistic

(From left:) Hon. Claude Hogan MLA, Dr Mike Pienkowski and Hon. Minister David Osborne at the workshop, with the Vision summary statement being finalised in the background

picture. I met Ted Waitt and Richard Branson, who introduced me to folks in FCO, which led to JNCC and the mapping work. A satellite image of the whole island in our GIS system will inform all our land-use planning. Our intergovernmental agreement with JNCC is establishing a data management system. Anything that the Montserrat National Trust wants from the database, they can have."

"I went to Paris and realised that we are way way behind. Before I met Mike, I thought I had to write everything myself. But, if so, we would still be arguing in Montserrat among the stakeholders about everything. This project was the best approach: get the stakeholders together, discuss, as we have done since 2015, to come up with intelligent suggestions to move Montserrat into the 21st century. Because the impact of the volcano, we have little farmland. So we need to visit the south for all the reasons we have explained; it should have happened already, for future generations. What we have entered here is the beginning of a whole new chapter. Some of us may not be around at the end, but our names on the attendance sheet show that we were here at the start, to safeguard our environment and our own livelihood. This exercise now has the evidence that the people of Montserrat buy into this exercise. What we are doing here is beyond formidable; we are now worrying about the bigger picture, we have moved beyond our own backyard."

"Thanks UKOTCF, all Ministeries, everyone, the secretariat of volunteers has produced documents which are the heritage of Montserrat."

"We have to be bound by this vision statement. I want to suggest an amendment [to the overview] so that whole workshop takes ownership. This amendment is a cue that this reminds you of ownership. I want to connect all that. To publish this vision, this is the new tool we use to leverage further funding, and sponsorship and adoption by the Government of Montserrat."

Mr Hogan facilitated amendment of the overview to the Vision, resulting in the following agreed wording: ***"Maximising the benefits from the potential usage of land in and near the restricted zones of the south in a way that will protect the special biodiversity in support of the people and economy of Montserrat into the future."***

Comments from the Minister for Agriculture, Trade, Lands, Housing & Environment, Honourable David Osborne MLA

"I want to thank my colleague, Claude, and for helping to facilitate this project."

"We, as the Government, have to facilitate anything that is going to be beneficial to the country. I am now in a position to help Claude to continue because of his knowledge and experience. Don't feel that it is going to be put on the backburner; Mr Hogan is going to be working a lot!"

"I have only a short time remaining, with another meeting shortly, but I am pledging help, and I know we need funds to do that. As of now, I will be available to come to workshops etc. Thanks for the wonderful work you have been doing. People need to understand the benefits of native plants, animal control, etc."

Next stages within and beyond the current project

Having checked that no-one had other comments or questions, Dr Pienkowski noted that UKOTCF would produce a workshop report and circulate it, as usual. He said: "Regarding carrying work forward, things are already happening. As noted earlier, JNCC-commissioned work is taking forward in partnership some aspects identified as needed by the present project. On the basis of the earlier workshops and related discussions, a proposal, in partnership with Montserrat National Trust, the Government of Montserrat, Montana State University, Wildlife Management International and Montserrat Island Dive Centre, has been submitted to Darwin Plus. [See following article.] This addressed some of the key needs agreed: a feasibility study and a recommended plan to deal with the feral animals, extension of *Adopt a Home for Wildlife* to address the invasive plants and restoration of native vegetation, extending the data in the *Montserrat Virtual Musem of Natural History*, badly needed surveys of other key species, and systems to meet the needs of environmental planners to be able to deploy this information in physical planning." Participants welcomed this and expressed hopes that it would be funded.

Mike Pienkowski said that he hoped that this would not be the last workshop (although it is the last workshop of this project), and UKOTCF wants to continue its over 20 years of involvement in Montserrat.

He thanked all participants of this and previous workshops.

The Montserrat Virtual Museum of Natural History

What will the Virtual Museum do?

The portal will be launched later in the year, but will incorporate in its design all of the feedback received during the visit by Mike Ivie and his team. The portal will allow access to the insect data captured and digitised by the Montana State University team within this project.

The previous issue of *SOS Nature of Montserrat* highlighted some of the activities that took place during the June visit. Amongst other things, this raised awareness of the importance of insects to Montserrat. Some of these benefits are provided in the *Did you know?* sections in this issue of the newsletter.

UKOTCF has also produced, for MNT, a poster featuring this information (*below, with Jean White and Nicolas Tirard of MNT; photo: Dr Mike Pienkowski*).

Montserrat partners and others join again with UKOTCF to apply for funding for the work that the current project has identified as urgently needed

The workshops, other meetings and conversations of the several components of this project have benefitted from the strong involvement of the Government of Montserrat, including the Premier, the Ministers of Agriculture, Trade, Lands, Housing and the Environment, their senior personnel, Departments including Environment, Physical Planning (including GIS), Agriculture (including Fisheries), its agencies, including the Royal Montserrat Police Service, the Disaster Management Coordination Agency, Montserrat Volcano Observatory, and Tourism, the Montserrat National Trust, the Waitt Institute, several land-owners and local companies of various types, as well as other interested persons, and the other project partners.

These have allowed Montserrat's conservationists and other stake-holders, in consultation with various specialists, to identify clearly the priority needs for effective conservation, including for effective implementation of the Conservation and Environmental Management Act as well as international commitments. As ever, the project partners have tried to persuade other organisations with resources to take up some of these needs, while we try to secure resources for those that cannot be delivered in this way.

The project's stakeholder-workshops generated agreement on the need to maximise usage of this land to protect biodiversity and benefit the island's people. Decisions need to be informed by reliable biological data – currently lacking. Pilot use of satellite-imagery of the south and anecdotal accounts provided useful information, but these need ground-truthing (relating the image to what can be observed in detail on the ground). Following stakeholder-preferences, the project takes a holistic approach and considers north and south together. Some of this will be achieved by project partners working with work being commissioned by JNCC, UK Government's statutory conservation adviser. However, more coverage will be needed, as well as information on key species which cannot be gathered by remote sensing. To meet needs of planners (Physical Planning Act), decision-makers (Conservation and Environmental Management Act), and others, information from these various sources need to be combined using the systems we have begun to develop, to form part of a strategic environmental assessment and a plan to address invasive species needs to be developed by experts in consultation with the community to maintain Montserrat's endemic species, as increasing impact of feral species on the natural forest is now becoming critically apparent.

Accordingly, project partners have put forward a new proposal to Darwin Plus to build on the existing progress. This project, *Maintaining the ark: recognizing and maintaining Montserrat's global biodiversity importance*, includes several urgent and important elements:

1. Filling data gaps

Few taxa on island are well studied and monitored. Collation of existing data not currently housed on-island and surveying to fill these gaps will provide an increasingly evidence-based foundation for decision-making. Including:

- Drone-surveys supplemented by ground-surveys, for mapping the distribution of terrestrial and inshore-marine biodiversity, especially for areas within the current exclusion zone (led by Government of Montserrat, UKOTCF & partners);

- Surveying high-altitude endemic insects in rare habitats in the restricted zone (led by Montana State University);

- Investigating plants (including suspected of extinction) surviving in area beyond the volcano but not recently surveyed (led by Montserrat National Trust);

- Capturing and digitising existing information from international institutions on important taxonomic groups, *e.g.* flies/bees, then adding to Montserrat Virtual Museum of Natural History (MVMNH) (led by Montana State University);

- Creating invertebrate and marine interest groups within MNT, encouraging local interest and enhance skilled volunteer work-force (led by Montserrat National Trust, Montana State University, Montserrat Island Dive Centre);

- Developing/implementing outreach, encouraging local interest of young people and citizen scientists to enhance skilled volunteer work-force (led by Montserrat National Trust/ UKOTCF);

- Training local fieldworkers, data-inputters and analysts in modern and time-effective techniques *e.g.* networked GPS-devices (UKOTCF);

- Contributing towards establishing a facility to attract/support visits from overseas experts, researchers and students to collect biodiversity data long-term.

2. Making information available to planners/decision-makers

Drawing on information from above and elsewhere to produce an environment report feeding into a strategic environmental assessment and complementing MVMNH. A further key element is a module urgently requested by planning/conservation officers to track development proposals/environmental assessments, constituting a key part of a National Environmental Information System (led by UKOTCF).

3. Invasive species

Specialists (Wildlife Management International Limited, WMIL), experienced in both invasive species and community consultation, will undertake baseline-surveys and consider feasibility of invasive animal removal/control, developing a plan to address feral animals in the restricted zone (an innovation, impracticable earlier because of volcanic conditions and reduced access) and revising/integrating the existing Centre Hills action-

Massive recent destruction caused by feral goats in the south of the island. There used to be Heliconia *in this area. Pressures on animals on the coast, the dryness and hunting, have pushed animals further into the forest, so damage like that shown is being done in areas not previously impacted. This makes the areas more susceptible to both hurricane damage and invasion by introduced alien plants which damage the native plants and animals. Photo: James 'Scriber' Daley*

plan. Preparations incorporate ground-surveys (now feasible using Montserrat-based helicopter delivering teams) and camera-traps in south to gather data.

Adopt a Home for Wildlife, an initiative developed in the current project, has proved an effective way to clear areas of invasive plants and maintain them for native species, while fostering a sense of local ownership and enhanced support for local civil-society bodies. This guided local-volunteer community-programme (innovative in the region) will be expanded to include international volunteers and the clearing of accessible areas of the restricted zone of invasive plants. Additionally, the marine interest group within MNT will ensure clean-ups undertaken at an increased number of underwater locations.

A vegetation-replacement plan and an area to dispose of the invasive plants without promoting their spread will be developed (led by Montserrat National Trust).

Wildlife Management International is involved in a number of projects in the UKOTs and elsewhere. They have gained a world-class reputation as the leader in providing advice and using consultative techniques to develop and implement plans to control or eradicate invasive species. They have visited Montserrat previously and have knowledge of the island and its people. They will be responsible for developing plans for the south, and updating/integrating plans for the north, on control of feral animals for Montserrat informed by what knowledge they are able to gain from the southern areas.

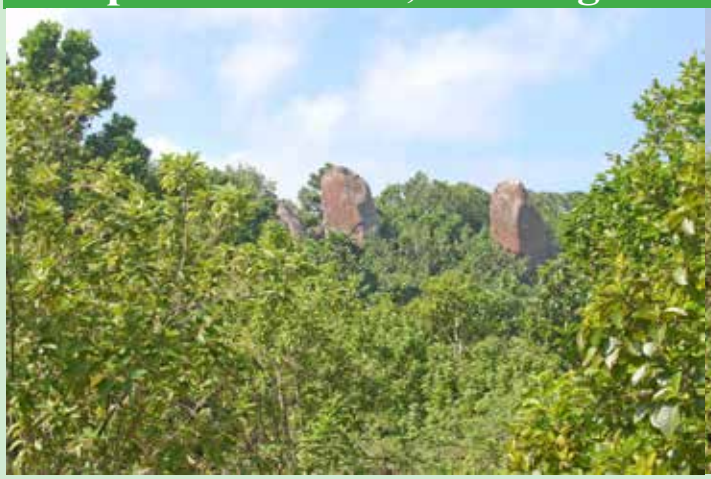
Montana State University houses the West Indian Beetle Fauna Project (WIBF). The team have collected, and entered the beetle information for the Montserrat Virtual Museum of Natural History (about to be launched), which will provide decision-makers, conservation practitioners and citizens across Montserrat with access to data on the island's wildlife. This information is important to biosecurity, agriculture (including pollination), and conservation of other flora and fauna. Currently, this has been populated with data on beetles, but will be expanded by this project to include information on other groups, initially bees and the island's flies (which include endemic species and provide important ecosystem functions). One of MSU's senior personnel is also an invasive species expert and will donate significant time to contribute to the work led by WMIL.

Montserrat Island Dive Centre has fully qualified diving instructors, and has pioneered work on underwater and shore conservation on the island. Their role will be to work with MNT to build up their marine conservation and survey capacity by the establishment of a group within MNT, to build on the pilot work carried out by both organisations relating to marine research, conservation and eco-tourism opportunities.

Especially interacting with volcanic consequences, human activities and invasive species are the principle threats to Montserrat's unique wildlife. The local community values ecosystem-services and wants to help maintain them. Researchers and trained fieldworkers will fill gaps in biological data to provide an evidence-base for informed decisions by planners, decision-makers and citizens, on how to limit biodiversity-loss while providing economic opportunities. Pressures on north Montserrat's environment are exacerbated by the needs to replace volcano-destroyed infrastructure, and for economic regrowth. Questionable land-use decisions have been noted by local planning/conservation officers and international specialists, with lack of environmental information available to decision-makers seen as the principal impediment. The south retains key areas of native-forest ecosystems with high endemism. These are threatened by feral animals, with damage levels becoming critical. These result from volcano-caused evacuation leaving previously farmed animals wild, and invasive plants spreading unchecked.

An important component of the future work will be to extend and expand the Adopt a Home for Wildlife *initiative. This is proving a highly cost-effective way of addressing the otherwise intractable problem of dealing effectively with alien invasive plants – as at Cork Hill (above; photo: Dr Nicola Weber). It includes also effective coastal and marine conservation (below; photos: Montserrat Island Dive Centre).*

Current project helps stimulate work by others, and UKOTCF/MNT provide advice, drawing in extra resources for Montserrat



SOS Nature of Montserrat *project personnel and* Territory-2-Territory *team work together to define vegetation types for ground-truthing of satellite images. Initially, this was in the far north of the Silver Hills, where the hardest volcanic rocks form high mounds emerging from the forest (left). (Right, and from left:) Tony TangKai (MNT's orchid expert), and Stephon Hixon (Montserrat field-worker and guide) advise Samuel Pike (Environmental Systems), Nicolas Tirard (Montserrat National Trust) and Gwawr Jones (JNCC) on vegetation identification and classification. (Below left:) The team at work in another vegetation type. Photos: Dr Mike Pienkowski (UKOTCF)*

One of the aspects which UKOTCF and MNT have been initiating in the present study is a start to vegetation-type mapping for the whole island, and some early results and their application have been the subject of the contents of earlier – and this – issues of *SOS Nature of Montserrat*. We are grateful for a grant from the DigitalGlobe Foundation, enabling the project to acquire otherwise expensive several high-resolution satellite images of the island. These images will aid our understanding of the island's vegetation types and habitat changes. This, in turn, helps us form an understanding of key associations and important ecosystem functions, *e.g.* between invertebrates and associated habitat types.

UK Government agency JNCC has now decided to commission some further work on this aspect as part of their *T2T* project between Montserrat and the Falklands Islands. We are delighted that Katie Medcalf's company, Environmental Systems, has been contracted to the short study on this. UKOTCF had introduced Katie to this issue in Montserrat in 2016, and she kindly donated some technical advice (see *SOS Nature of Montserrat 2*, page 7). In turn, Katie sought UKOTCF's advice on ground-truthing, and UKOTCF put her in touch with Nicolas Tirard (Montserrat National Trust), our part-time Project Officer.

Whilst the JNCC-commissioned study will not fulfil all needs in this area, it should make a valuable contribution, to build on our initial work, and to combine with our planned future studies involving both remote-sensing and ground-survey.

The JNCC-commissioned team's visit to Montserrat partly overlapped with that of the current visit of the present project. A year earlier, the JNCC-commissioned project had held a workshop in Montserrat concerned mainly with fisheries. That project would gather and integrate fisheries data, to improve food security and sustain the cultural value of the fishery. An MSc thesis had already contributed to this. Training has taken place in fisheries data-collection. The training conducted in Montserrat included representatives from other Caribbean UKOTs. Clear process and protocols for fishery data-collection were being developed, and the training will lead to fishers understanding why they were collecting the data and what this means to Montserrat.

The teams from the two project consortia took advantage of the overlap to work in the field together to develop common understanding of the vegetation definitions for ground-truthing high-resolution satellite images. These will be used for further habitat mapping, to understand the composition of the natural environment, and monitor changes over time. The JNCC-commissioned work was based on previous work in the very different sub-Antarctic UKOT of South Georgia. Therefore, working alongside personnel from the UKOTCF/MNT/GoM/Darwin project was particularly valuable, benefitting from the project's MNT expertise.

One of the most threatening alien invasive species, purple allamanda (centre), spreading rapidly in an over-grazed area of the Silver Hills. Photo: Dr Mike Pienkowski

Adopt a Home for Wildlife partners make progress

In *SOS Nature of Montserrat issue 2*, we gave the background to the setting up, as part of the current project, of *Adopt a Home for Wildlife.* Through this, the Montserrat National Trust (MNT) aims: to conserve and enhance the beauty of Montserrat; preserve the fauna and flora of Montserrat; make the public aware of the value and beauty of the island's heritage; pursue a policy of conservation; and act in an advisory capacity.

MNT is looking for partners in the community to lend a hand in keeping the island beautiful, clean and full of unique wildlife and habitats.

MNT is grateful for the support of UK Overseas Territories Conservation Forum, the Darwin Plus fund and the other partners in the present project, in setting up this programme.

The *Adopt a Home for Wildlife* in Montserrat programme allows individuals, organisations, community groups and businesses to agree to maintain and protect a public space for a year at a time, with renewals annually. The programme runs all year round, and gives everyone the opportunity to make a difference in their local area. In the next section, we report some new partners, but first we summarise progress so far in a couple of the sites introduced previously.

Ventana, Garibaldi Hill

SOS Nature of Montserrat 4, pages 6-8, introduced us to Tim Orton's tropical dry forest, one of the most threatened ecosystems in the world. Tim, with advice from Project Officer

Tim Orton shows Ann Pienkowski along one of the paths created by removing invasive plants. Photo: Dr Mike Pienkowski

Part of the view from the newly accessible vantage point. Photo: Dr Mike Pienkowski

Nicolas Tirard of MNT, has been busy at his *Adopt a Home for Wildlife* site at Garibaldi Hill, as the UKOTCF team saw when it visited again in November.

The garden and forest give him a lot of pleasure – indeed, that is a main reason to acquire this home and enrole in *Adopt a Home for Wildlife*. It is an area of about 3.5 acres with 1 acre of garden around the house. About 3/4 of an acre have been cleared of invasive plants, and work progresses.

Tim was delighted to discover that it cost about the same to remove *Acacia* and invasives by hand as it would have cost to bulldoze. The advantage of not bulldozing is that the native vegetation remains, rather than having to re-plant and wait for it to grow to the same size. Also, this route means employment for several Montserratian gardeners.

It took 5 weeks to remove invasives from an area which is a sort of natural pathway to the top of a rocky outcrop with a magnificent view that Tim did not even know was there. He hopes eventually to have some kind of circular walkway going from garden to path to tropical dry forest with some labelling of trees. This could even be an opportunity, by prior arrangement, to bring school children and other interested visitors into a tropical dry forest environment to see how different it is from other habitats across the island. In time, rainwater will be used for irrigation which will add to the sustainable management of the area using natural resources.

At the moment the area needs some care every few weeks or so to ensure that fast-growing species are kept back and do not get out of hand. However, when native trees from the MNT nursery establish themselves, this need will be reduced. Some of the larger trees were damaged during the hurricane but, with the Native Plant Nursery project, there will be some available for replanting, particularly gumtrees which are found a lot in this area.

Some highlights of the garden/forest are that tarantulas and fireflies are thriving. All three species of native hummingbirds

Tarantula partly emerges from burrow. Photo: Dr Mike Pienkowski

Bush, probably Bourreria succulenta*, with scented white flowers that is frequently visited by all three native species of hummingbirds and Lesser Antillean bullfinches. This bush is native from south Florida to Trinidad. It provides a lot of food for other birds, like pigeons when in fruit, as well as to butterflies when in flower. The fruit is non toxic to humans. Photo: Catherine Wensink*

are found in the garden. Six adult male birds visit the garden regularly on their feeding routes. Bats are doing very well at stripping the saporilla. Results of beetle and other invertebrate collection in July by Montana State University are still to be analysed. Since buying the property in 2010, Tim has seen a resurgence in wildlife after ash-fall caused significant reduction. The plants in the garden close to the house are a constant source of food for wildlife.

Unexpected bonus at Belham River mouth at Old Road Bay

In *SOS Nature Newsletter 4* (pages 8-9), we introduced Mr Dwayne Hixon's second *Adopt a Home for Wildlife* site in the area of new ground at Belham River Mouth. Here, as we described in that issue, he has been clearing an area over-run by introduced alien invasive *Casuarina*. He will be collaborating further with Montserrat National Trust which will provide suitable shade-providing native species to plant.

Meanwhile, oher aspects of his works have involved the excavation of the volcanic material adjacent to the old jetty. As a result, temporary pools formed in the bottom of these. During our visit in November, there was a steady turnover of migrant shorebirds in these pools, with 8 different species and variable numbers present at several visits during a 2-week period. These species breed in North America, in some cases in the high arctic, and spend the non-breeding season in wetlands in the Caribbean and South America.

These sort of birds previously used former wetlands including Fox's Bay marshes and Piper's Pond – both now lost due to volcanic outwash for the former and unfortunate human-undertaken infilling for the latter.

The observations in November show that a wide variety of migrant shorebirds are still looking for homes. Provision of such wetlands, perhaps incorporated more permanently in the designed development of some of these low areas, would again enrich the natural environment of Montserrat with exciting animals like these, attractive to both residents and visiting tourists. The project team can advise anyone who wants to create such areas – and advise also where such creation would be inappropriate, for example because of the importance of the existing environment.

Some of the migrant shorebirds at Old Road Bay: snipe (left), greater yellowlegs (right), with pectoral sandpiper (in front and, closer, below). These species breed in North America. In the case of the pectoral sandpiper, the breeding range spreads from high arctic Canada, through Alaska and across Siberia. It has been discovered recently that individual males may range widely over this arctic range to breed with several females. In some cases, this is across both continents, with one male recorded as travelling 8000 miles within one breeding season. Photos: Dr Mike Pienkowski

The excavation and pool at Old Road Bay, from the east (left) and, closer, from west (right). Photos: Dr Mike Pienkowski

And new partners join *Adopt a Home for Wildlife*

Restoring Cork Hill through community endeavour

After hearing the project team with Rose Willock Culture Show on ZJB Radio during the June/July visit (as reported in *SOS Nature of Montserrat* newsletter 4), the Cork Hill Reunion Committee contacted the Montserrat National Trust and expressed shared concern about the potential impact invasive species such as the blackberry is having in this area. They were interested in working together with MNT to manage the area, using native plant species and installing facilities to enable them to use sustainable practices such as harvesting rainwater and generating solar energy. Therefore, the Committee joined the *Adopt a Home for Wildlife* initiative.

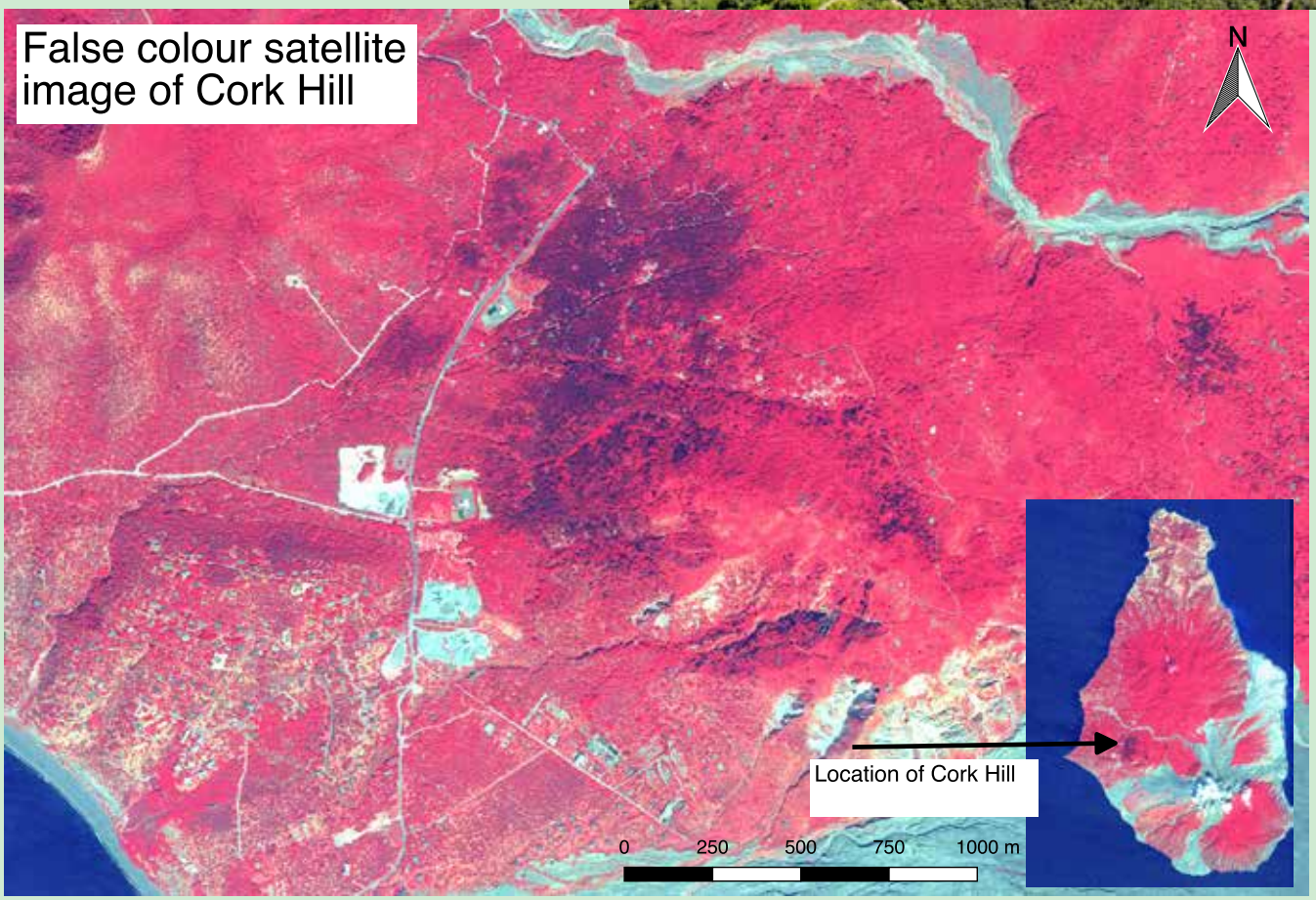
In March 2016, the Committee had become registered as a Friendly Society under the Friendly Societies Act. It was formed in order to provide a focus for the gathering, sharing of ideas and developing plans for former residents of Cork Hill area, whether still on Montserrat or the UK, US and elsewhere.

Following the volcanic eruptions, now over 20 years ago, residents of Cork Hill had to leave their homes and relocate to the north. In the 2017 budget, the Office of the Premier announced that the work of the Cork Hill Reunion Committee in organising a reunion, in March had been an inspiration. They wanted to support the effort and therefore Cabinet approved granting exemption from Import Duty and Consumption Tax for three years on all building materials imported specifically to repair or build any structure located in those villages of Cork Hill and other sites in the exclusion zone. This aimed to give direct support to those people wanting to rebuild their homes and regenerate these areas. The initiative is expected to "encourage significant construction activity in the private sector. As a business opportunity, it allows for the building of new homes and villas for sale as we increase housing and villa stock".

Members of the Committee, Roland "Jabo" Irish and Hewlett A Williams, met with the project team on site on 7th November. They explained that the Committee comprises of volunteers and activities are focused currently on three main areas: the park, the clinic and the Pentecostal church.

"We have about 30 members now. Most of the work is

Below: False colour image shows the spread of blackberry (the very dark areas) on Cork Hill in this 2015 image (raw satellite image courtesy of DigitalGlobe Foundation; analysis by Catherine Wensink). We know that blackberry is good at storing carbon and has very dense leaves. Plants reflect near infrared and green light, while absorbing red. The leaves of blackberry are so dense they absorb more red light, therefore making them appear darker in this image compared to the vegetation which surrounds them. Right: The sports field at Cork Hill, cleared of invasive black-berry by the Cork Hill Reunion Committee, from the air. Note that the area has been cleared since the satellite image below. Photo: Catherine Wensink



Old Cork Hill Health Centre and prospective visitor centre. Photo: Dr Mike Pienkowski

done on the weekend. We have events here and are planning one in December. We are fundraising for activities and are bringing people over to show them we are getting back; we are getting there," explained Mr Irish.

Mr Williams added that: "The Government of Montserrat was instrumental in restoring the park for the Cork Hill Community. We didn't want that work to have been carried out in vain." He explained that the Committee wanted to have a maintenance plan and to do their best to look after the area and control the regrowth of vegetation where it had become invasive and unmanageable.

They added that: "there is a lot of blackberry around at the moment. We make wine and juice out of them, but they must be removed from much of the area and kept under control elsewhere."

"The long-term plan is that this becomes a tourist area again. We don't have public facilities, in terms of toilets and so on. So we would hopefully like to set up a visitor centre at the old health clinic, with toilets inside, fixed-up roof, harvesting water and using solar panels to power the pumps, and so on. That is the long-term plan. Tourists come into the area and they really want to use somewhere, so we will have something. Basically, that is what we are trying to do."

Mike Pienkowski noted that this is very compatible with the project aims, and recalled the book that UKOTCF and MNT had produced about bird-watching and other visitor interest in Montserrat to try and encourage people. Mr Irish welcomed this and the reinforcing opportunies with the Committee's work.

We saw the first main success: the clearing of the large sports ground where a variety of sporting events will take place (*e.g.* cricket and golf) – and a golf tournament has already been held. Some grass seed has been planted to stabilize the soil. The Committee sought advice from the Trust in for guidance on what vegetation would be suitable for shading around the edges of the ground, beautifying the area, but which are native and rare on Montserrat.

Nicolas Tirard, Darwin Project Officer offered to provide the Committee with advice and access to some of the native plants which were being grown at the Trust as part of the nursery project (see pages 16-17) and which would soon be made freely available for any community groups involved in the *Adopt a Home for Wildlife* initiative to plant out. This will maximise the range of those species found only on Montserrat or only in the region.

Mr Williams then took us to his family home, which he had to leave following the volcano. He showed us his recently planted pineapples in the cleared garden around the house. Nicolas pointed out that the non-native Philippines orchid *Spathoglottis plicata* could be seen on his roof and the neighbouring house (*right; photo: Dr Mike Pienkowski*). This has become a real problem in Puerto Rico. It is a fast growing species, particularly in the tropics, and studies suggest that its presence leads to an increase in numbers of the orchid weevil, which then increases in number to become a pest species threatening native orchids.

It was evident that the blackberry had really taken a hold on the area in the last 20 years. In this area, there are large stands growing to over 3 metres. The area where this had spread is still relatively small and Mr Irish felt that it was important to control it where possible. He was very keen to explore how this could be done. Nicolas thought that a nearby area overgrown with blackberry might be a good trial removal site, for clearing the area of blackberry trees, and then planting some native trees, such as white cedar *Tabebuia heterophylla* or lignum vitae. They

The sports field at Cork Hill, cleared of invasive blackberry by the Cork Hill Reunion Committee, discussed by the Cork Hill and Adopt a Home for Wildlife *Project teams on the ground. Photos: (left) Catherine Wensink; (right) Dr Mike Pienkowski*

Blackberry trees overwhelming the formerly residential area at Corkhill: (left) just the road remains uncovered (so far); (centre) houses now almost hidden behind the invaded front gardens; (right) the useful fruit, but only if the bushes are managed in gardens and not abandoned. Photos: Dr Mike Pienkowski

would be fast-growing in an area cleared of blackberry. During the trial, monthly checks could be carried out to remove any blackberry shoots until the native tree species were established.

The Committee members expressed interest in working with the project also to explore clearing of invasives and restocking native species where owners would like this, and potentially extending local joint efforts to include visiting volunteers co-ordinated through *Adopt a Home for Wildlife*.

The Cork Hill Reunion Committee members were invited to the workshop (pages 1-7) to talk a little about what they had been doing in the area and their plans for future restoration of the area in collaboration with the Trust.

Lookout School

Another new recruit to *Adopt a Home for Wildlife* is Lookout School. Principal, Mrs Denelta Weekes, showed the project team around the school grounds. The team saw the possibilities of lessons involving practical propogation of seeds and later using the resulting plants. Project Officer Nicolas Tirard identified the possibilities for raised beds for vegetables and other plants on the barren soil-less flattened rubble left by the builders, by bringing in soil from nearby. The Principal saw a need for sun-shading trees around the boundary of the playing field, as places to allow comfortable outdoor discussions and lessons. The MNT nursery would be able to provide suitable native trees. The help of Public Works would be needed to machine-dig holes in the material left by the builders and fill with soil to allow these to flourish – a problem not overcome in some earlier attempts by others.

Discussions started on the best scheduling, in relation to the school year, the availability of plants and the best planting and growing seasons. The potential of capturing rain-water from the roof to assist establishment in this fairly arid environment was also identified.

Other new sites in *Adopt a Home for Wildlife*

Project Officer, Nicolas Tirard, and his wife, Ravo Ratianimarina, have recently completed building work on their house in Old Towne, and the empty garden is the next stage. Having been re-assured that there is no conflict of interest in the Project Officer making his own garden an *Adopted Home for Wildlife*, Nicolas and Ravo enthusiastically joined the initiative.

We are delighted that, during the project team visit, Hon. Minister David Osborne also offered his garden, which needs attention after hurricane damage, to be another site within the initiative.

More on both of these in a later issue of *SOS Nature of Montserrat*.

Why not join *Adopt a Home for Wildlife*?

As is clear above, the initiative is moving ahead steadily, both with new *Adopters* coming forward and with work on each of their sites. However, there are many other places on this special island which need *Adopting*.

Montserrat is a special island with much to celebrate. Montserratians are renowned for their welcome and hospitality – and are connected with their island's environment as all depend on it for so much, *e.g.* the water from the Centre Hills, and the natural remedies from plants. Some areas, which are so important to the way of life, are under threat because of the actions of a few: for example, dumping of rubbish, which stops the flow of the streams after heavy rains and attracts flies and mosquitoes. This programme gives all a chance to put these things right by caring for this treasured island and showing others that Montserratians appreciate what makes it so special.

(Left, from left:) retired (or, as she says, "recovering" teacher Ann Pienkowski (UKOTCF Environmental Education Coordinator), Principal Mrs Denelta Weekes, Catherine Wensink (UKOTCF) and Nicolas Tirard (MNT) discuss the project; and (right) inspect the potential raised-bed site, with the playing field beyond. Photos: Dr Mike Pienkowski

In addition:

- Adopting an area promotes a cleaner, more liveable neighbourhood and gives YOU an active role.
- You can give your group/business/family positive attention for the valuable service you provide.
- You help Montserrat, your island, by volunteering to clean up and maintain its uniqueness.

Contact Nicolas Tirard at Montserrat National Trust.

Progress on native-plant nursery to restore populations

Young broom palms Coccothrinax barbabensis *(above) and overtop palms* Syagrus amara *(below) growing at MNT's native plant nursery. Photo: Catherine Wensink*

When Mappi, stalwart of the botanic garden, and Project Officer Nicolas Tirard discovered an area where seeds from the native broom palm *Coccothrinax barbabensis* were accumulating but were not developing, they were excited by the possibility of propagating them at the nursery so that they could once again be seen across the whole of the island (as reported in *Did you know?* in *SOS Nature of Montserrat* 4, page 18). The seeds were brought back to the Trust and, to date, 150 seedlings are being grown there. They will soon be available for those taking part in *Adopt a Home for Wildlife* initiative (see pages 10-16).

Another palm species found on Montserrat, in addition to the *Acrocomia aculeate*. This is a type of feather palm with a spiny trunk and edible nuts. It is not known whether this is native or was introduced by the Amerindians. It is found in the Lesser Antilles, but has become very rare on other islands such as neighbouring Guadeloupe. Only two of these have been found on the island, so they are being propagated and will be displayed in the Botanic Garden until more is known about them.

As a result of Hurricane Maria, many of the seeds that were supposed to be collected in September were blown away from their parent trees before they were ready for collection. Despite this challenge, the team is germinating some seeds now for the species; the resulting plants will be given to "Adopters".

The propagation area (*above; photos: Catherine Wensink*) will be closed to the public. However, a new shade-house (*below*) –

which will be open to the public – has been built on an unused part of the botanical garden, to serve as a display of the plants propagated by the Montserrat National Trust. This structure was supposed to be erected in September, but the fury of the month delayed the start of the work by several weeks. Some of the plants on display will be the classic ornamentals that are traditionally sold at the gift shop as a source of funding for the Trust, and others will be local endemic or endangered species, to be reintroduced in the wild in an effort to maximize their population size on our island.

The first local palm trees are already germinating and will be available for reintroduction shortly, and the new shade-house area will soon be open to the public. They will be able to select and pay for native species and ornamental (but non-invasive) plants. Those taking part in *Adopt a Home for Wildlife* will be able to take away endemic and native species to plant out on their land at no cost. Records of these will be kept, so that the Trust can monitor the amount of plants given out, which will give an indication of how the ranges of endemic/rare species have been increased. The Trust will, of course, provide advice to those planting these native plants.

The plants available come under four categories: endemic to Montserrat, regionally endemic, rare, and ornamental. For the last category, those species chosen will be used to beautify areas

but are not known to spread widely, *i.e.* will not become invasive and a threat to native vegetation.

In the first category, endemic species will be made available. Two hundred broom palm and two hundred over-the-top palms will be provided initially.

In the second category, tropical dry forest species will be used, *e.g.* pepper cinnamon *Canella winteriana*. Native species which are fast-growing and easy to propagate, *e.g.* gumbo limbo *Bursera simaruba*, fiddlewood *Citharexylum spinosum* and white cedar *Tabebuia pallida*, will be ready for collection and planting in the new year.

For the trees to be used for reforestation, species used will depend in part on the size of area. An initial site visit by the Trust to discuss plans and best options with "Adopters" will take place in order to develop ideas for their land or the areas they are managing. For example, in Cork Hill (see pages 13-15), the Trust will work with the community to understand their requirements and make suggestions. These could include, for example, native palms for around the cricket field. For other places of larger areas for planting, it may be possible to plant trees in rows or in a formation which is pleasing to view.

With the new display space and materials covered by the EU BEST grant (*e.g.* irrigation, pots etc.), leveraged by the Darwin Plus funding, ornamental plants will be available also to purchase for those not engaged in *Adopt a Home for Wildlife*, giving some income to the Trust, to support its conservation work.

The Trust is hoping to experiment with a buy-back scheme (or voluntary return) for the pots. If they are returned after the plants are transferred, then they can be re-used by the Trust for many years, rather than the plastic soil bags, which are single-use, potentially polluting and certainly wasteful of materials and energy. Furthermore, this will encourage recycling on-island, giving the community a sense that they are doing something 'green'.

The existing border of the endemic shrub, the 'pribby' *Rondeletia buxifolia* was installed with the assistance a project including

Pribby growing wild in Silver Hills. Photo: Dr Mike Pienkowski

the Royal Botanic Garden, Kew in 2007 (part of an OTEP grant which pre-dated Darwin Plus). This will be tidied when the public nursery is launched. It grows in the wild but can be tamed into a nice border or hedge. It is displayed at the Trust as an example to landowners, as something which can be replicated on their land or at their own homes.

Other improvements at the garden include: an irrigation system, installed under the ground. The official launch to highlight the equipment to members of the community is expected to take place before the end of the year. The system will use rainwater collected in two large containers underneath the Trust offices, pumped by solar power, which will be generated from the solar panel on the roof of the building. (An earlier grant secured by UKOTCF contributed to the rainwater collection equipment.)

Helping the orchids

In November, a specialist in orchid propagation, Anthony TangKai visited the island from Trinidad, bringing with him a 'wet box', which is a sterile environment where one can do orchid seed propagation and transportation. Mr TangKai has supported the Trust's flower show for many years and was on the island to give a workshop on how to use the device. This method of propagation will be manageable by the Trust and it is something that people on-island can learn and enjoy using. It may even inspire people to take it up as a hobby.

Tony joined UKOTCF's Mike Pienkowski and colleagues in the

Above: Tony TangKai shows his wet-box to Dr Nicola Weber, Sarita Francis and Catherine Wensink.
Right: Tony orchid-hunting up tree, for Pleurothallis *sp., possibly a new species recorded for Montserrat (lower).*
Photos: Dr Mike Pienkowski

field to find a range of orchid species (from left): native *Polystachya* sp. (*concreta* or *foliosa*), native *Epidendrum ciliare;* invasive *Oecoclades maculata*.

SOS Nature of Montserrat team on Montserrat Radio ZJB

Now a regular feature during UKOTCF's visits to Montserrat, members of the project team again joined Rose Willock for about an hour of discussion on her Saturday morning show on ZJB Radio on Saturday 11 November 2017.

The UKOTCF/MNT team present included (from left) Dr Mike Pienkowski, (Rose), Nicolas Tirard, Catherine Wensink, Ann Pienkowski and (behind the camera) Dr Nicola Weber.

As well as public information, Rose's programme has proved helpful in securing more public partcipation (see pages 13-15).

...and on French television

In October, with facilitation by Project Officer Nicolas Tirard, Montserrat received a visit by a small team from France shooting a documentary about the island. They visited the Montserrat National Trust botanical garden and went for a site visit in the Silver Hills with Mapie. Mapie showed them several species of the flora found in Montserrat, with a special focus on the pribby, an endemic plant of the island. He explained the project of the Trust to propagate it and make it available for people to use as a hedge in their garden. The documentary will be broadcast in France in 2018 by the TV channel "France Ô", and the Trust will receive a copy of it.

The TV crew in action with Mapie. Photos: Nicolas Tirard

Hurricane impacts and recovery

What impact does a Hurricane have on the islands' biodiversity?

When a hurricane hits, one of the most immediate impacts on the natural environment is on the vegetation. Leaves become twisted and huge mature trees are uprooted. Birds and other animals may lose their food supply of fruits and flowers when these are stripped off the plants.

In areas not inhabited by humans, vegetation will pile up and start to rot. This creates blooms of invertebrate species that are quite rare, but favour these conditions.

During a storm the wind goes back and forth, and this can break up the vascular tissue within trees so that some can often die months afterwards. From an entomologist's view (of which we have one: Mike Ivie, from MSU), this sets up amazing habitat for wood-boring beetles. This is also good habitat for fungi; therefore, insects which feed on fungi will also have a population surge.

During Hurricanes Irma and Maria, many Caribbean islands were stripped of vegetation. In these areas where leaf-feeding species occur, there are likely to be effects on their populations. There will most likely be changes in insect species composition, whereby the uncommon/rare species populations experience a surge in abundance. This creates somewhat of a challenge for fieldworkers/researchers as some species, which are most of the time rare, will be easier to find and document when conditions are suitable, but this is only likely to last for a relatively short period of time.

It is unlikely that species will become extinct due to the occurrence of the kind of hurricanes experienced this year as hurricanes have always been naturally occurring. The prolonged and strength of these is perhaps another matter entirely. However, the interaction of these natural events (albeit possibly exacerbated by human-induced climate-change) with other results of human activity, such as loss of natural habitat, may generate additional adverse consequences.

The month of September was a bit rough in Montserrat, with two hurricanes, Irma and Maria, passing close to the island. The island did not suffer any damages from Irma, as the eye moved to the north, causing devastation in Barbuda, Saint-Martin, and Anguilla before moving to the Greater Antilles, with only tropical storm force winds in Montserrat – although the packing away, securing and unpacking of materials meant loss of at least a week of work.

Maria came second, and passed south of Montserrat, hitting Dominica very hard. Some hurricane force winds and a lot of rain were recorded on Montserrat, but not for a very long time. A lot of trees fell, disrupting power and cable supply, some roofs suffered minor damages. A few places have suffered more, like People Place, a restaurant at the top of Forgathy Hills, which was largely destroyed and is being rebuilt.

MUL workers were on duty every day and managed to restore power supply on the whole island in less than two weeks, which is remarkable considering the amount of damage. Internet connection was a bit longer to be fully restored, about a month in most places, the connection being erratic long after that.

In term of the natural environment, the forest was heavily damaged in some areas, especially at the highest locations. A few landslides have been recorded in the Centre Hills, and their scars will probably still be visible several month after the event. A lot of sand has been taken off the beach on the Caribbean side, destroying most of the turtle nests that happened to have been very numerous this season.

Much work remains to be done to clear the trails through the forest and this is being planned at present.

Blockages on the Oriole Walkway trail are matched on most of the other trails. The needs have been surveyed and tenders are being invited to clear the trails in an appropriate way. From the top: fallen trees block trail; Scriber helps one of the team around a temporary detour; the team survey a blockage; Ann diverts around a fallen tree.
Photos: Dr Mike Pienkowski

In a normal year, the challenges to Monterrat would have been considered quite large. However, they were moderate compared with the devastation in Anguilla, BritishVirgin Islands and Turks & Caicos, and we all send our best wishes to these territories.

SOS Nature of Montserrat team

In this regular section of our newsletter, we introduce some of the team working on the project. In this issue, we correct an omission!

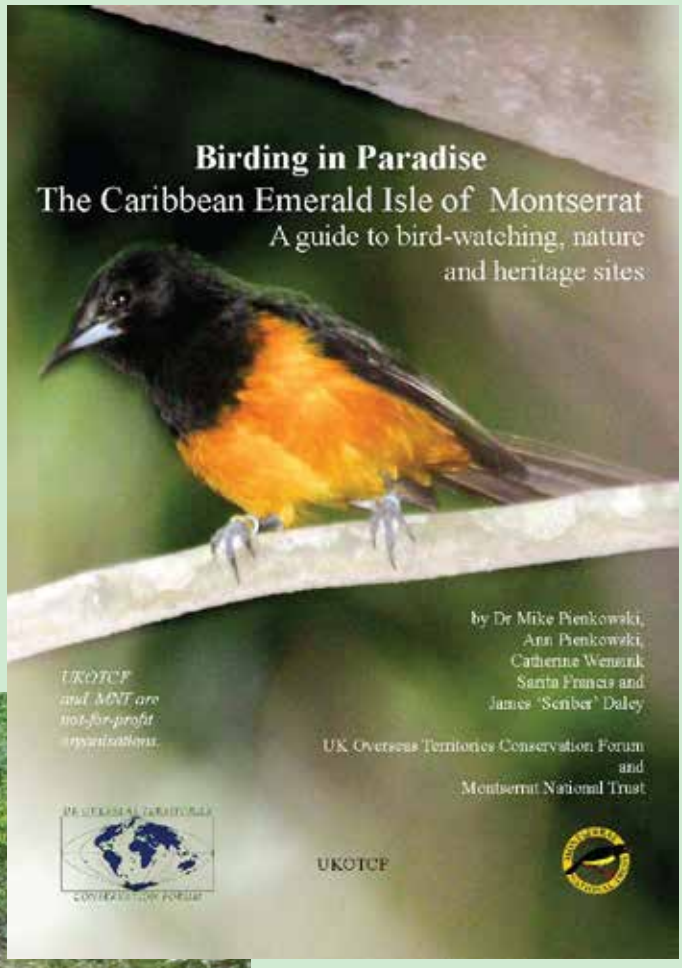
James 'Scriber' Daley

We surprised ourselves a little when we realised that we had not yet featured Scriber in this series - although he has appeared in some context in every issue. James qualifies in several ways: as a key member of the Department of Environment team, as an active supporter of the Montserrat National Trust, and as a natural teacher running the outstanding guiding small business in the island – amongst other roles.

James grew up on a farm in the South Soufrière Hills of Montserrat, and taught himself about the birds and other wildlife. He guided early visitors and worked on research projects on conservation needs, becoming Montserrat's expert. In addition to working on conservation for the Forestry Department and playing a leading role in mountain rescue, Scriber combined his natural skills as a teacher and his knowledge of the birds and other wildlife to establish and operate a business in leading trips for bird-watching, other nature-watching and hiking: Scriber's Adventure Tours. He is always keen on taking school trips into the forest, and also to pass on his skills and knowledge; his young colleague has already featured in this series.

James made his unique knowledge available as part of the team of authors of UKOTCF and MNT to produce *Birding in Paradise: the Caribbean Emerald Isle of Montserrat – a guide to bird-watching, nature and heritage sites.* He also helped Mike Pienkowski find some of the birds to photograph for that book and other uses, and Ann Pienkowski to video these for the short Montserrat video available at www.ukotcf.org/videos/index.htm

In the present project, James has made key contributions in the workshops on the future of the south, work on insects, looking at future needs, and many other aspects.



Top: Scriber leads a school party nature watching. Photo: courtesy of James Daley
Above: Front cover of Birding in Paradise (available locally from Montserrat National Trust, and by mail or download from www.ukotcf.org/birding-in-Monserrat/index.htm
Left: Scriber, with some of the UKOTCF team (Dr Nicola Weber, Ann Pienkowski & Catherine Wensink) after exploring the hurricane-damaged Oriole Trail. Photo: Dr Mike Pienkowski

Impressions of the south with a bird's eye view

It is a laboratory. Researchers studying ecological restoration or succession would be very excited to see the southern areas of Montserrat. There is an amazing gradient of places that have been virtually pristine, then devastated, then recolonised.

The level of devastation by volcano and subsequent partial recovery in some areas is clear to see. It is possible to record all six habitats found on Montserrat, along with how these have changed over time.

Nicolas Tirard, Project Officer at Montserrat National Trust, said: "I took so many photos. It will take a long time to process them!" UKOTCF Chairman and Project Leader, Mike Pienkowski added: "I have an even bigger job, as I was using two cameras!"

Director of UKOTCF, Catherine Wensink, described one of the highlights. "When the clouds parted and you could see the forests of tree ferns; it was like something out of Jurassic Park." *(Above; photos in this article: Catherine Wensink, except where indicated.)* Mrs Wensink continued. "I was struck by the diversity of plant/tree species. I have seen areas which have been cleared entirely for wood (a bit different to what has happened on Montserrat) but, when they regenerate, it has tended to be only a few species taking over." The tree-fern forest is unique. This cannot be found in a lot of places in the world. The tree fern is native to the Caribbean. However, is rarely seen in monospecific clumps like this *(below, photo: Dr Mike Pienkowski)*, a sign of disturbance.

Goats were evident and some clear images of their impact were taken *(for example, at top of next column)*. In other places, the tree cover is still present, but there is no longer an under-storey, so a strong hurricane will have a much more devastating effect than it should have. Also, this makes the area more susceptible to

invasive plants. Some areas are going to become bare and barren if this continues. The understorey is completely bare land. If, with climate change, we experience stronger and more frequent hurricanes, it is going to interact even more strongly with what the feral animals have already done.

James 'Scriber' Daley, who is more familiar with the area than anyone, was surprised by how quickly erosion was taking place towards the south coast. Trees are disappearing rapidly from the coastal areas. Boats of (illegal) hunters were seen anchored inshore below the forest *(below, photo: Dr Mike Pienkowski)*, and (as noted elsewhere) pressure from these is widening the damage by feral animals.

There are large areas of wild tamarind *Leucaena leucocephala* in areas where there has been high disturbance. Seeds will take root in holes were trees once would have been.

There was a lot of elephant ear *Philodendron* growing *(below)*.

A stand of lignum vitae could be seen in the ghauts at lower levels. It was very bright green *(above)*.

Tracks of green turtle *Chelonia mydas* were seen in the area close to the old airport. It is way late and out of the normal season now.

Coccoloba, a typical member of the dry forest and dry thicket community, was abundant.

Around Landing Bay *(above)* there are some tropical dry forest which look to be very rich and in good condition. However, we will need to look at these in more detail.

"It's a big area, some still with bamboo forest. But much is already so eroded. The tree ferns show the disturbance of the area over the years." recalled Scriber, expert in the field and resident of St Patrick's before the volcano.

Did you know...?

Bombardier beetle

As reported in previous newsletters, Montserrat is home to over 700 species of beetles, with 80 found nowhere else. These beetles have incredible stories. One such incredible species is the bombardier beetle found on Montserrat.

This was only known from one specimen found in amber from the Dominican Republic. This was not only an undescribed species, but an un-described genus *Eohomopterus*. We know there is a different species found on the top of the mountain on Guadeloupe. These have in their back end two sets of reservoir glands they are paired in both sides of its rear end. They come together in the back of the body. When they are disturbed or threatened they release a substance from the back end. When the two chemicals meet they cause a reaction which reaches a temperature of over 400°F. If you were to pick it up, it would burn you. They have a flange so that they can pull their abdomen forward shooting the chemical forward. They live with ants. The larvae of the beetles eat ants, but the adults give off a chemical that the ants like. (*Photo: Dr Mike Ivie, Montana State University*)

Net-winged beetle

Another is the net-winged beetle, found only on Puerto Rico and Montserrat. Puerto Rico has one species, but Montserrat has two! DNA analysis has shown them to be distinct species. They have been here along time. They give off a pink liquid something that looks like peptobismol. Larvae feed on rotten wood, day-flying adults are common in the forest. Not only are they on the island as a special endemic, but there is a long-horn beetle, which is not related to them at all, found only on Montserrat that mimic the net-winged beetle. By looking like another species, which the birds know they should not eat, they don't get preyed upon. This relationship is unique to Montserrat. We don't know how long it has taken to form this relationship. It is clearly important to preserve this. (*Photo: Dr Mike Ivie, Montana State University*)

Red click beetle

The red click beetle has been known to scientists since 1895 from one specimen in the Natural History Museum in London. Guadeloupe has this species, but it is green instead of red. The specialist in this group decided that the one specimen from Montserrat must have been a colour morph (that is a variation) but, while the WIBF team were on Montserrat, they collected 6 specimens, which indicates that it was not a variation at all, but an entirely separate species. There is no variation; they are all red. This is an example of where a specimen has been misidentified for a very long time and in fact is unique to Montserrat. (*Photo: Dr Mike Ivie, Montana State University*)

Did you know...?

Montserrat orchid

We confess that we did feature this species *Epidendrum montserratense* earlier in this series. However, with it in flower during our recent project team visit, we could not resist revisiting it! Indeed, the Montserrat orchid can be a spectacular species blooming right on time for the festival of Montserrat. This species is endemic to the island, and closely related to another species endemic to the nearby island of Guadeloupe: *Epidendrum mutelianum*. It is found growing as an epiphyte on the bark of old trees, and can be commonly found on mango trees in some parts of the Centre Hills. The species is considered to be critically endangered as a result of habitat destruction, both by the volcano, and by human development. As a result, it is protected by law in Montserrat and any wild collection should be avoided. The species suffered heavily from the volcanic explosion, adding to earlier habitat loss. Montserrat National Trust is working to encourage the general public to restore a good level of population of this orchid (see also pages 16-18), via provision of plants to *Adopt a Home for Wildlife* sites, training courses in propagation and other means.

More project reading in the Darwin Initiative Newsletter

An article on the project appears in the November issue of the Darwin Initiative Newsletter (https://tinyurl.com/y94dafjy).