



Saving Our Special Nature of Montserrat

Newsletter 3, March 2017

Foreword



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

Welcome to the third issue of the newsletter about the new 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 two newsletters. We hope that you enjoy this one too. In it, we highlight the starting of the first local *Adopt a Home for Wildlife* projects, which are gathering increased participation by local people. We provide the first reports on the the second intensive period of work in late November and early December when again visiting experts worked alongside local people. We touch on some of the project work going on all of the time in Montserrat, UK and elsewhere. We look forward also to the visit of the Montana State University (MSU) team (and UKOTCF) in June-July 2017; the MSU team are well advanced on designing Montserrat-centred access to database systems and entering previous insect survey work into the database. Their visit will both

test its match to Montserrat's needs and provide training to people in Montserrat in the use of the online database, and continue the insect fieldwork, in which local people will be welcome to participate. We include also an article on MSU and members of that team, as well as some of Montserrat's special wildlife.

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

Adopt a Home for Wildlife - update on progress

In 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 preservation and act in an advisory capacity.

MNT is looking for partners in the community to lend a hand in keeping our 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.

This page (right) and next: Views of Carr's Bay, one of the first two Adopt a Home for Wildlife sites. Photos: Julian Romeo





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 you the opportunity to make a difference in your local area.

Why Adopt a Home for Wildlife?

Montserrat is a special island with much to celebrate. We Montserratians are renowned for our welcome and hospitality. We are connected to our island's environment as we depend on it for so much, e.g. the water from the Centre Hills, and the natural remedies from our plants. Some areas, which are so important to our 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 us a chance to put these things right by caring for our island and showing others that we appreciate what makes us so special.

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.

Update

Since this introduction, a great deal of progress has been made. This is summarised below for two sites. The leader volunteers for these two sites are profiled on pages 3-4 of this issue.

Runaway Ghaut

The site adopted by Dwayne Hixon is located above the road in Runaway Ghaut. It has been partially landscaped as a recreational area in the past by both the Rotaract and a volunteer group led by Valerie Romeo.

It used to be a small loop going from one side of the ghaut to the other, with picnic table and ornamental plants. The passing of a storm in 2012 destroyed one side of the path, and the site has been left unattended ever since. As a result, the path is no longer used by the population and has started to become overgrown. Also, some introduced ornamentals have started spreading into the forest, with a risk that they will become invasive, and damage

the natural wildlife.

This part of Runaway Ghaut, being above the road, is relatively clean. However, the use of the site as a tourist attraction and the lack of a garbage facility cause the downstream part to be vulnerable to unauthorised garbage dumping.

As a good and accessible example of the ecosystem of the ghauts in Montserrat, the site carries a high educational and conservation value. Endemic plants of the Lesser Antilles could be replanted for landscaping and to promote their wider use. Plans to be able to supply such plants are underway (see below).

Carr's Bay

The site is located at the end of Collin's Ghaut, between the historic site of Carr's Battery and the river. It used to be landscaped and there is still a picnic table with two benches. In addition to the historic value, the site is sitting next to one of the very few small areas of mangrove ecosystem on island, and carries therefore a high biological value.

However, the lack of protection from the sea following the destruction of Gun Hill, and the pollution flowing from the river to the sea make the site very vulnerable. Lack of information and warning about the native and useful, but dangerous, manchineel trees are also of concern.

Mr. Romeo expressed interest in protecting the site from the sea with big boulders, and landscaping it with native plants to help stabilize the beach.

Next stages

Work on these sites will develop and continue, and the Project Officer will explore further sites with a number of people who have expressed interest in helping with these.

In addition, the project team has worked successfully to be awarded a new grant (see page 4) for a linked and complementary project. This is a nursery for native plants at MNT's Botanic Gardens. The two related projects working together will enable a reliable and free supply of suitable plants and advice for the sites and their volunteers who join the *Adopt a Home for Wildlife* work.

SOS Nature of Montserrat team

In this regular section of our newsletter, we introduce some of the team working on the project. In the first few issues of the newsletter, we obviously tended to cover those involved in planning and developing the project. We are delighted to include in this issue the first of the Montserratian volunteers, who will be involved in implementing the project on the ground. These are in the form of interviews conducted by Project Officer Nicolas Tirard.

Elsewhere in this issue, we include profiles of the insect and database team in an article on project partner Montana State University. The team members have been at work throughout the project so far, developing a Montserrat-tailored access system for the web-database system, and inputting existing material (from previous visits of entomologists). In June-July 2017, the team will be in Montserrat to show interested persons the system and to do more field-work.

Julian Romeo

Hardware store owner



Julian Romeo. Photo: Nicolas Tirard, MNT.

1. Have you already been involved in an initiative to improve the environment on Montserrat? When and Where ?

Yes. I did some **clean-up in Salem** and **provided trucking** to evacuate trash.

A few years ago, I wrote a **proposal** with Arthur Meade to get funding from the Tourism Department. We wanted to clean all the valleys (ghauts) from Runaway Ghaut to Carr's Bay. Unfortunately, a lot of people submitted proposals and our request was unsuccessful.

2. Were you happy with what you accomplished?

Cleaning Salem is a necessity and I am proud to have done it. It is the first place people would go to when visiting Montserrat and it is currently not looking good. We cannot wait for the Government to take action, we need to step up.

3. What place do you want to adopt?

There are two places requiring immediate attention : the beach in Carr's Bay and the ghaut of Nantes River.

- I understand the situation in **Carr's Bay** is complicated for political reasons, but I still think there is work to be done here.

Everyday, tourists stop in Carr's bay to take pictures of the cannon battery and it is degrading rapidly. We need to take the cannons to the MNT [Montserrat National Trust] and refurbish them. People still take sand from the beach here, leading to small collapses of the tree shore. We need to make a plan to landscape the place and use it as a green space.

- **Nantes River** is a place I would like to adopt with a group of volunteers. I know the owner of the lots around the ghaut near the main road, so I believe we can get authorization to do so.

4. Why do you think it is necessary?

The whole Salem area needs to be cleaned, as it is the main gathering point for visitors of the island. Starting with Nantes River could be a good first step.

5. Do you want to do it on your own or set up a group of people?

I can gather a group of individual volunteers, and possibly provide access to some tools, like trucks.

6. Why is it important for you?

It is important for me because I love my country and want the best for it.

7. What sort of resources would you want to allocate to this task?

I could provide some of my time and try to get the help of other volunteers. I could provide access to some material, like trucks.

8. What actions are you ready to undertake?

Cleaning and landscaping is something I would like to do, but more generally, I want to resurrect places. Bring back life in abandoned areas, doing restoration.

9. How would you convince other Montserratians to get involved?

I think the main problem here is the lack of consequences for littering. Even if the legislation is strict, it is not enforced. People know each other and won't fine a parent or a friend, and this behaviour has dramatic consequences. When I was in French St Martin, I realised that gendarmes [police] always come from overseas for short missions (3 months). As they are not part of the community, they are not afraid to enforce the laws strictly, and as a result people don't litter.

As a member of the Rotary, when we install garbage disposal, we usually find more trash around the bin than in it. It is a politically difficult situation, but if the situation is to improve in the long run, we need to focus on **education**.

Dwayne Hixon

Real estate agent and contractor

1. Have you already been involved in an initiative to improve the environment on Montserrat? When and Where ?

Yes. In **Runaway Ghaut** in the past, we did some action with the Rotaract. We kept the site clean and did some landscaping work, including planting a row of palm trees.

On my lot beside Runaway Ghaut, I do my best to maintain

Dwayne Hixon. Photo:
Nicolas Tirard

the side of the road beautifully landscaped.

2. *Were you happy with what you accomplished?*

Absolutely. We had the feeling that we “did our part” to maintain Montserrat clean and beautiful. We adopted the place through a verbal agreement with the National Trust at this time.



3. *What place(s) do you want to adopt?*

Runaway Ghaut is my priority as it is the immediate surroundings of the place I work at every day. I think it would be necessary to do something at **Soldier Ghaut** too, to prevent people from dumping garbage in this beautiful site. I was discussing this with one of the owners of this place this morning, by the way.

Another site I would like to value is **Old Road Bay**. I want to build a beach bar here [as previously existed before volcanic outwash] and to do so in the most respectful way for the site. Landscaping with native species could be the way to go.

4. *Why do you think it is necessary?*

I think it is necessary because everybody enjoys seeing a clean and green environment. At some point people need to do their part of the work.

5. *Do you want to do it on your own or set up a group of people?*

I would rather do it myself with my company.

6. *What sort of resources would you want to allocate to this task?*

I would provide some of my time and the time of my co-workers.

7. *What is your goal, by adopting this place?*

Generally, I want to keep the environment surrounding me as clean and green as possible. I think if everybody who can do their part, we can keep Montserrat clean and welcoming.

8. *How would you convince other Montserratians to get involved?*

I would spread the word amongst my workers, and could probably try to get a little help from my Rotary group.

Did you know...?

Rondeletia buxifolia - The Pribby

Did you know that Montserrat is home to two strictly endemic plant species? One of them, locally known as the pribby, is a very dry-resistant little shrub with a beautiful boxwood-like foliage. It can be found on the foothills of the Centre Hills or near the top of Silver Hills.

A demonstration hedge has been planted in the Montserrat National Trust botanical garden, so if you want to discover it, just come and the staff will be happy to show it to you!



Pribby. Photo: Ravo Ratianimarina

BEST funds awarded for native plant nursery

The Montserrat National Trust has been successful in securing a BEST small grant, for a native plant nursery. The Montserrat National Trust is extending its plant nursery to start propagating native species, with a special focus on endemics. The plant material produced will be supplied to volunteer community projects, such as *Adopt a Home for Wildlife*, and be available for sale for public or private landscaping.

There are several goals for the project:

- To promote the use of native species for landscaping in an effort to preserve and value the local biodiversity, and reduce the use of resources (native species are adapted to the local conditions and do not require as much water and fertilizer as some imported ones).
- To allow the restoration of degraded ecosystems by making sure native species are available for replantation.

- To increase the population size of several endemic species (island or regional endemics) by planting them in private gardens or public spaces, therefore reducing the risk of disappearance of those species.

This new exciting project will provide complementary resources to those of the current project, part-funded by Darwin Plus, and help us reach our goal: to preserve the diversity and specificity of our ecosystems! Preparing the proposal for BEST support was possible only because of the existing Darwin project and the support provided by UKOTCF. The two projects increase significantly the resources available to MNT. These provide yet another example of the importance of both UKOTCF help and funding from both UK Government and the European Union to Montserrat, and to other UK Overseas Territories.

SOS Nature of Montserrat project partner organisations

In this regular section of our newsletter, we will profile, in turn, the organisations which are partners in the project.



Montana State University Entomology Collection Team

Michael A. Ivie is Associate Professor and Curator in the Department of Entomology at Montana State University (MSU). Many of you will remember that in 2005, he took part in the project to survey the insects found in the

Centre Hills. He worked with MNT, DoE as well as several UK institutes including: Durrell, Royal Botanic Gardens, Kew, RSPB and others. During these surveys, he found there to be a rich insect community compared with several nearby islands in the Caribbean where he had also conducted research.

Montana is a western state of the United States, which covers an area of 381,154 km² stretching from the Rocky Mountains to the Great Plains. The MSU team's research involves many surveys of the insects of Montana, but they also hold collections for many Caribbean islands. Until now, the MSU team has been getting on with their work in Montana, as part of their involvement in the Montserrat project. However, there are plans afoot for a visit in June, which they hope will excite, inform and inspire. MSU are leading on delivering output 2: Better local capacity to address development and conservation issues and support this by biological databases.



*Dr Mike Ivie, in front of Montserrat's volcano on a previous visit.
All photos in this article: Montana State University*



Back in 2005, Mike's team collected over 13,000 invertebrate specimens as part of the Centre Hills project. It is estimated that Montserrat has more than 1,200

insect species. For an island of 102 km² that is quite remarkable. Many of the insects collected are so small that they require specialist equipment to view them. As such only a handful of specialist scientists in the world are able to identify them down to species level. With the expertise of Dr Ivie and his team at MSU, this project will focus on building a collection of ground beetle species for Montserrat. Many of these beetle species are important to Montserrat as they circulate soil nutrients and are prey for larger animals. Some can only be found on Montserrat or nearby islands.

The basic knowledge and understanding of insect communities on Montserrat are lacking. Whereas the US and the UK have extensive collections dating back centuries in their gigantic museums, these do not exist on many islands in the Caribbean and do not on Montserrat. This is what makes this element of the project so exciting- it will be possible to have a collection for the island, which will be viewable online, for all to access. It will also be used for future planning and conservation efforts (see box on Biological Collections below). Insects are so important to many of Montserrat's iconic species. We aim to make some of these insect species iconic too!

The West Indian Beetle Fauna (WIBF) group, based at MSU, holds specimens which have been collected over many years throughout the Caribbean. Although mounted and stored carefully, only a small proportion of these have been entered on to a database. This is hosted by Ohio State University with MSU as a partner and does not have any maintenance costs so it will be available in the long-term. It conforms to international

Biological Collections

There is general agreement amongst taxonomists (biologists who group organisms and look at relationships between different types of organisms) that biological record collections involving preserved insects as examples of their species (or a specimen) are still hugely important today. This is the case even in a rapidly changing society where many collections are being digitalised and new techniques suggested.

Specimens can last for hundred of years if mounted and looked after carefully. Their removal from the wild is very unlikely to have an impact on the total population. They provide a point of reference on which to identify new species or those thought to be lost. They provide a basis on which to conduct research, for example, changes in climatic conditions.

Each year, museums around the world host thousands of visiting scientists, students, artists and collections management specialists to view collections for conducting research and other work. Their value as living collections is considered invaluable today as it was hundreds of years ago.



(Left:) Example of one of the database records and (above) a high-resolution image of the species addressed, *Chrysobothris marskae*.

from MSU and is currently taking it further with a Master's degree. He has been responsible for the web presence of the Montana Entomology Collection, the Bumble Bees of Montana Project, and the Wood Boring Beetles of Montana Project, as well as the West Indian Beetle Fauna Project. When not busy creating thousands of webpages, James enjoys playing drums, painting, writing, drawing, and crafting graphic design masterpieces. His most recent project is an interactive map of species in the Caribbean that can be filtered by island for countries with multiple islands.

James said: "I'm glad to get the chance of working on this project. Montserrat, from the newsletter and searches, is so interesting to me. There seems to be endless knowledge to gain from it."

In June, a team from MSU will visit Montserrat in order to present a mock up of the web portal, carry out a series of educational activities and catch up with old friends. Mike will lead the expedition.

He says: "I have travelled a lot throughout the Caribbean and the world. Montserrat is one of my favourite places on earth, mostly because of the people. I cannot wait to get back there and see colleagues and friends as well as deliver our part in the project".

In addition to these activities, the team will conduct further collections in areas outside of the Centre Hills, particularly in areas they didn't manage to sample last time. These included coastal areas- as the students were not given any time off from fieldwork for relaxing on the beach! They also include built-up areas and areas associated with agriculture. It may be that they find all sorts of interesting critters in the nooks and crannies on Montserrat. Watch this space...

Mike would love to work with a variety of people while on island: amateur collectors, students, children and anyone who is interested. The Montserrat National Trust will be working to facilitate this and should be contacted in the first instance.

Montana State University were awarded a grant from Digital Globe Foundation, a US based company which owns satellites which constantly orbit the Earth taking digital images. The images of Montserrat, which have been donated will enable the team to use high resolution satellite imagery to survey areas of the island which are difficult to reach, particularly the south (see elsewhere in the newsletter). We would like to thank the Digital Globe Foundation for this generous donation. See www.digitalglobe.com.



James Beck

standards set for biological databases.

An example of one of the database records is shown here, together with a high-resolution image of the species. This is one such species found nowhere else on earth. Mike tells us there is no common name for this beetle. So *Chrysobothris marskae* it is.

Two students from MSU are working on inputting each specimen in to the collection. Sarah Rubin is a major in Museum Studies and Lazaro Vinola is a Cuban student studying paleontology. Both of them have valuable experience in working with museum collections and their attention to detail is a real asset to



Lazaro Vinola (left) and Sarah Rubin, inputting data from the Montserrat Beetle Collection

the project. A web portal is under construction for Montserrat, which will function like the portal designed for the Montana bee collection (see screen shot). It will display data with some summary information and details of how to identify Montserrat's insects.

James Beck is a web developer and designer at Montana State University. He has a Bachelor's degree in computer science

Planning & Environmental Management: incorporating environmental considerations into physical planning



Left: Minister Hon. Claude Hogan opens the feedback presentation and discussion session in the Montserrat National Trust meeting room.

Above: Dr Jo Treweek (standing) and Jennifer Hruza give the opening presentation, with Project Officer Nicolas Tirard on the right.

Photos: Dr Mike Pienkowski

In order to meet part of their strategy for progressing towards a self-sustaining economy, the Government of Montserrat has been looking for investment into the island, for the delivery of “transformational projects”. Whilst projects such as these hold much economic potential, they can also provide regulatory challenges, in addition to the risk of adverse environmental impacts. In order to prevent these risks from materialising, this type of project therefore requires a robust approach to planning, environmental assessment and management – something that almost all development finance institutions and commercial banks now require.

To this end, one aspect of the Darwin Plus project focuses on integrating environmental and social aspects with physical planning. This links with the overall project objective of maximising long-term survival prospects of Montserrat’s threatened species of plants and animals. The aim was to build on the results of a previous workshop on environmental impact assessment that was provided, *pro bono* and without grant support, by Treweek Environmental Consultants (TEC) and UKOTCF in January 2015. TEC is a project partner and a small consultancy, specialising in ecological aspects of environmental assessment and planning. TEC works with clients in many sectors and countries, and with governments and private sector investors, to help them achieve sustainable outcomes for biodiversity and ecosystems affected by their operations, loans and investments. Jo Treweek and Jennifer Hruza, are consultants from TEC. There were profiles of both in the previous project newsletter (number 2).

During the December 2016 visit, Jo and Jennifer used stakeholder meetings and interviews to review the scope for tools and guidance that could be used to strengthen the planning and environmental assessment systems to improve outcomes for



Round-table discussions. Photo: Dr Mike Pienkowski

biodiversity and ecosystems. The visit provided an opportunity to assess progress on addressing the challenges that had been identified by stakeholders in the 2015 workshop and also to learn about the practical experience of implementing the Conservation and Environmental Management Act 2014 (CEMA) and its regulations.

Montserrat’s planning and environmental management framework has several positive elements but would benefit from more systematic consideration of environmental aspects. This would help minimise potentially negative interactions (in either direction) between the proposed development and the natural environment. It would also help maximise the quality of life for the residents of Montserrat – the purpose if such procedures are not simply to be bureaucratic hurdles. Addressing gaps in the regulatory regime would be an important step towards improving environmental outcomes. (For example, CEMA regulations have not yet been enacted.) It would also help to support an improved consideration of biodiversity. This will be crucial if Montserrat is to seek the transformational projects that are currently being discussed. Following the visit, TEC produced a report detailing key findings and recommendations, along with a biodiversity checklist and other tools.

We would like to thank Jennifer and Jo for their work. The report will be available soon, after being reviewed by our Montserratian counterparts. If you are interested in receiving a copy, please contact cwensink@ukotcf.org.



Jo starts preparing for the summing-up. Photo: Dr Mike Pienkowski

Second workshop for all stakeholders to explore options for the future of the south of Montserrat

2nd December 2016 was a busy day at the Montserrat National Trust (MNT), with the second in a series of four workshops exploring options for the future of the south of Montserrat. This particular workshop developed further the outcomes of the workshop held in May 2016, which sought answers to the question of “why would it be good to carry out work in the south?”

The overall aim of the workshop series will be the development of a vision and initial plan for the future use of the south, produced in consultation with stakeholders. While other elements will also be included, one emphasis will be upon the restoration of natural ecosystems.

Various potential activities and outputs, as well as risks and constraints, were identified by participants at the initial workshop in May. Examples of activities identified included the removal of invasive species, the protection of the island’s water supply, and research and rediscovery opportunities.

The second workshop was therefore designed to expand these initial thoughts by identifying further information requirements, for example: resources that would be required, technical needs, potential conflicts with other suggestions, stakeholders who would be involved, and opportunities a particular activity would provide. The idea was that this would reveal the feasibility of potential activities and refine ideas further.

The day commenced with a warm welcome from MNT Executive Director Sarita Francis. This was followed by an overview of the Darwin Plus project by UKOTCF Chairman Mike Pienkowski, and an update of activities from Project Officer Nicolas Tirard. Mike also introduced Dr Jo Treweek and Jennifer Hruza of Treweek Environmental Consultants (TEC), partners involved with other aspects of the project related to physical planning (see page 7).

Conservation Officers, Emma Cary and Sarah Barnsley, then conducted the next part of the workshop. This involved participants splitting into smaller groups, discussing pre-drawn activity tables (based on the outputs of the first workshop) and noting down any ideas in this structured format. A hard morning’s work was rewarded by a delicious lunch, prepared by Mavis Duberry. This was followed by a more relaxed afternoon, whereby Scriber gave an update as to the vegetation changes that have happened in the south following the volcanic eruptions.

Following the workshop itself, a report was produced summarising the discussions according to the main opportunities presented by potential work in the south. Many socioeconomic opportunities were identified, and discussions focused on the feasibility of activities, the improvement of existing practices, and the commercial potential of various activities (without adverse environmental impacts). One important consideration is that many proposed activities would be reliant on other activities being carried out in conjunction. One example would be that



*Workshop participants hard at work in groups.
Photos: Marisa Sorrell, Coral Cay Conservation; and (above) UKOTCF*





Left and right: Views of a visit to the Roche's area. Photos: James 'Scriber' Daley



invasive species and the manner of use of farmland would require appropriate management, in order to prevent the degradation of high-value land.

All activities require investment of resources and skills, risk assessment and collaboration between multiple stakeholders and departments to ensure safety, legality, and viability. Some

themes appeared in the majority of discussions, such as access and land-ownership. Furthermore, the need for a detailed environmental survey and mapping of the south was identified as being a key requirement that would provide the foundation for the implementation of other activities.

Did you know...?

Syagrus amara - The Overtop Palm

Did you know that out of the many palms found in Montserrat, only a handful are native species. The coconut tree was unknown by the Carib Indians and was introduced to the Caribbean. However, its close relative, the “overtop palm”, was very useful to them and is still present on several locations in Montserrat.

A tall (60ft) majestic species, resembling a slender coconut with dark green leaves, this species is surprisingly little known on-island. The only member of its genus not native to continental South America, it is a local endemic, naturally present only in a few islands of the West Indies, Montserrat being the northernmost.

It has suffered greatly from habitat destruction as it grows naturally in low altitude forest, where most of the farming and development occurs. As a consequence, this species became very rare in some islands. Montserrat still has a robust wild population, but mainly in the forest close to the volcano. Only 5-10 mature or submature individuals, plus seedlings, are known away from the proximity – although there could be others not yet found. Preservation of this beauty could be done by replanting it in safe parts of the island, making the population more resilient to catastrophic events.



Overtop palms: (left: overtopping the canopy, with foreground greenhouse indicating scale; top: crown; above: seedling).

Photos: Nicolas Tirard

Satellite imagery in the project: a preliminary outline

The overall aim of this aspect of the project is to inform the discussions around output 3: Plan for the restoration and management of Montserrat's Exclusion Zone – but it may also help meet other requests from the Departments of Physical Planning and Environment.

When the project team first developed the proposal, they knew it would be important to be able to say something about the vegetation of the south. As access was always going to be an issue, methods were explored to try and gather information in other ways.

At the 2015 conference for conservation practitioners, organised by UKOTCF, hosted by Government of Gibraltar, and attended by MNT and DoE, the use of satellite imagery and remote sensing for land management was discussed. Dr Katie Medcalf, who has more recently visited Montserrat, gave a presentation on its uses and examples of previous work in Anguilla. Much of the technical information provided below is taken from her presentation, which can be found in full at: www.ukotcf.org/confs/gibraltar2015.htm.

So what is the vegetation like in the south? It is well known that a substantial area of forest remains in the volcanic exclusion zone, and beyond the volcano. This is clearly visible on images in GoogleEarth. GoogleEarth is an online tool, which uses data from aerial surveys and from satellites, which orbit the Earth, to

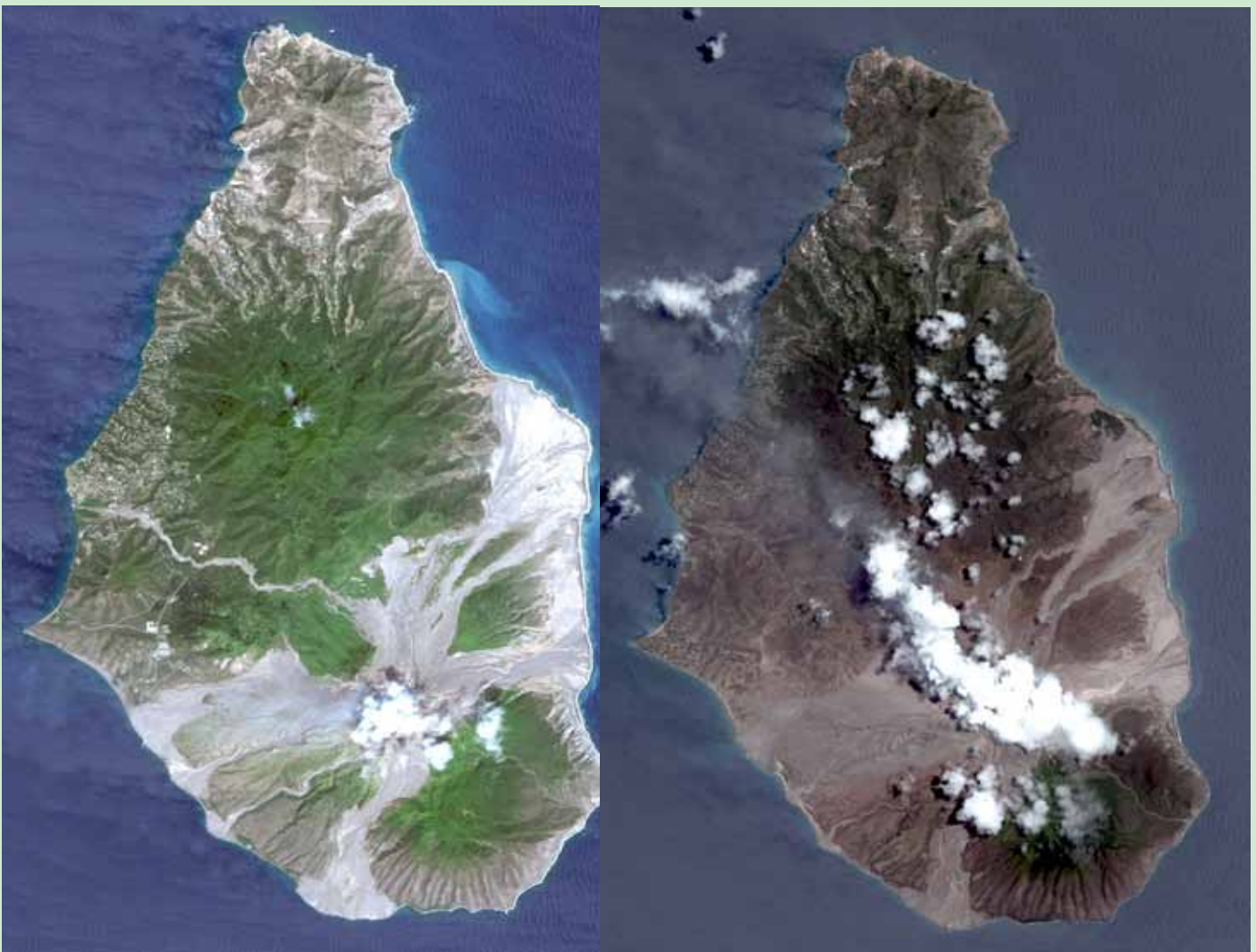
create a composite aerial image of anywhere on Earth.

Through his work with the Forestry Department, James 'Scriber' Daley occasionally visits the south. He often posts images of the forest on social media. At first sight it appears to have been replenished following volcanic activity. However, apart from his observations and those of a few colleagues, little is known about the vegetation types found there.

As it would be impractical to conduct adequate surveys on the ground due to access, satellites can be used to provide a vast amount of information about the Earth from space. For example, multi-spectral imagery can capture light from frequencies beyond the visible light range such as near infra-red (NIR).

NIR is useful when looking at the vegetation in an area as the strength of the signal from the ground (or a tree) is related to the structure of a leaf. Green light is reflected from the top surface of a leaf, whereas red and blue light are absorbed and used in photosynthesis. NIR passes through the top surface of the leaf, but is generally reflected from the lower surface. This means that the most fleshy and thus productive leaves give a higher NIR reading.

In order to relate information collected about the south to Montserrat's endemic species, the DigitalGlobe Foundation awarded a satellite imagery grant to this project, through the



Satellite image of Montserrat on 29 March 2015 (left), and 14 May 2006, in a very dry period (right). Copyright © 2016 DigitalGlobe Foundation

Montana State University. Especially in view of the very high commercial costs of such images, this has provided a significant contribution to the project.

In order to use this grant most effectively, support was needed to assist the team to process the imagery. This support comes from time and expertise donated by Duncan Hutt, Head of Land Management at the Northumberland Wildlife Trust. Together with his wife Sally and son Fraser, they have been hugely supportive of other UKOTs, by volunteering through UKOTCF. This has involved taking part in on-the-ground projects and organising talks to raise awareness of the UKOTs in the UK. Duncan has a background in use of remote-sensing and habitat management. Preliminary results, using NIR, indicate that the vegetation found in the south is similar to that found in the Centre Hills when compared with other areas of Montserrat such as Silver Hills and Garibaldi Hill.

Further analysis will be conducted and then reported in later newsletters. In the meantime, on the previous page, are two of the stunning images obtained with the grant. That on the right was taken in 2006, and shows very clearly how different Montserrat looks when it is experiencing times of extreme drought.

The WorldView-2 satellite in a clean room prior to launch. This was the third of DigitalGlobe's state-of-the-art high-resolution commercial imagery satellites launched in 2009. With a grant from the DigitalGlobe Foundation www.digitalglobe.com, it is possible for our project to look at the vegetation of Montserrat in areas that are difficult to access.

Photo: © DigitalGlobe www.digitalglobe.com



Did you know...?

***Heliconius charitonius*, the zebra butterfly** (below)

Although this species has a very wide distribution in South and North America, the form pictured here at the MVO, belongs to a subspecies found only in Saint Kitts, Antigua and Montserrat: *Heliconius charitonius punctatus*. It is a reminder that biodiversity occurs also within a species, as well as between them!



***Rhabdodryas trite watsoni* (*Phoebis trite*)** (below) feeding on a Barbados pride flower *Caesalpinia pulcherrima* at the MVO. The males of this species are often found in groups close to the ghaunts, where they collect mineralized moisture.



Photos: all butterflies by Richard Robinson Askew. In October 2016, Montserrat National Trust received a visit by this expert entomologist. Mr Askew has published work on a lot of different categories of insect around the world. He notably published a book presenting the butterfly fauna of the Cayman Islands. During his stay in Montserrat, Mr Askew prospected for butterflies and found 28 species at 17 sites. Butterflies are usually great travellers. So, none of the species of butterflies found on-island is strictly endemic (i.e. is found only on Montserrat). However, several of them are local (Caribbean) variations.