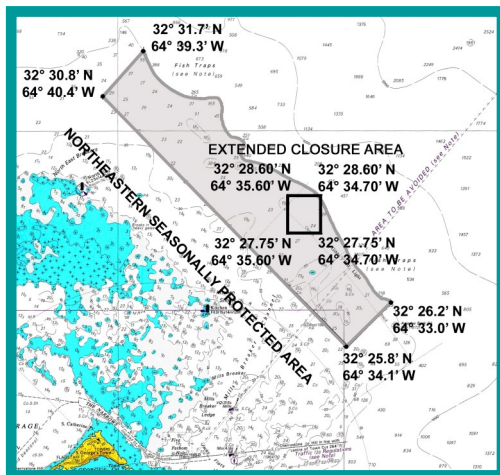


Bermuda Biodiversity Action Plan

Activity Report

2019



GOVERNMENT OF BERMUDA

Department of Environment and Natural Resources

Bermuda Biodiversity Action Plan Objectives

A: To ensure effective **coordination**, improved **collaboration** and ongoing **communication** in support of efficient biodiversity conservation such that all key stakeholders are engaged throughout the implementation of this plan.

B: To ensure that biodiversity conservation is integrated into all **Government policies, programmes and plans** by 2007.

C: To improve and strengthen **environmental education and training** programmes for every age group by 35% over the next 5 years.

D: To increase **public awareness of biodiversity**, its inherent values and conservation activities throughout the community by 100% over the next 5 years.

E: To increase the active participation of the **community** and the **private sector** in **ecologically responsible behaviours** by 25 % by 2007.

F: To provide appropriate economic and other **incentives** to effectively encourage people to **protect and enhance biodiversity**.

G: To revise and develop laws that address all key identified gaps in existing **environmental legislation** for implementation by 2007.

H: To ensure that **enforcement** effectively deters infractions against legislation such that violations decline by 50% by 2007.

I: To strengthen the level of protection, where appropriate, through the re-designation of existing **protected areas**, and to increase the area of fully protected **nature reserves** and **marine protected areas** through land acquisition or marine designation by 25% and 10% respectively; and to ensure the effective management of the protected areas network by 2007.

J: To develop new and revise existing **management plans** for all key **species and habitats** and to ensure their implementation by 2007.

K: To increase **research and monitoring** by 25% by 2007, as demonstrated by outputs, so as to support the management of Bermuda's biodiversity.

L: To secure from both public and private sources the **financial commitment** and other investment necessary for full implementation of the BSAP as required.

Bermuda Biodiversity Action Plan

Summary of Actions Completed by Partners in 2019

Compiled by Alison Copeland,
Biodiversity Officer

This report is a compilation of activities reported to the National Biodiversity Strategy and Action Plan (NBSAP) Coordinator by partners or appearing in the local news. The activities below are either directly called for in the Bermuda NBSAP or were carried out in the spirit of biodiversity conservation and met the goals of the NBSAP. The bracketed numbers and letters are references to specific lines in the 2003 Bermuda Biodiversity Action Plan. The complete plan can be viewed at http://environment.bm/s/Biodiversity-Action-Plan_March2003.pdf

In the first section activities are listed in chronological order to provide a snapshot of what was happening in Bermuda at various points in the year. Additional activities that were ongoing throughout the year or for which no time frame was reported are listed in the second section by contributor.

This document is a searchable PDF. The best way to search for specific information within the report is to search keywords in the Adobe search function. Key words have been **bolded** to aid skimming. Photos are the author's unless otherwise indicated.

Any errors or comments on this report can be submitted to the Biodiversity Action Plan Coordinator at environment@gov.bm.

Literature Reference: Copeland, Alison. 2020. Bermuda Biodiversity Action Plan Activity Report 2019. Government of Bermuda, Department of Environment and Natural Resources, Flatts, Bermuda. 37 pages.



ABBREVIATIONS USED IN THIS REPORT

BAMZ – Bermuda Aquarium, Museum and Zoo

BAS – Bermuda Audubon Society

BEST – Bermuda Environmental and Sustainability Taskforce

BIOS – Bermuda Institute of Ocean Science

BNT – Bermuda National Trust

BUEI – Bermuda Underwater Exploration Institute

BZS – Bermuda Zoological Society

DENR – Department of Environment and Natural Resources

IUCN – International Union for the Conservation of Nature

KBB – Keep Bermuda Beautiful

NOAA – National Oceanic and Atmospheric Administration (USA)

UKOT – United Kingdom Overseas Territories

KEY ACTIVITIES 2019

The public consultation period for the **Draft Bermuda Plan 2018** ran from December 3rd, 2018 until March 15th 2019. <https://www.gov.bm/draft-bermuda-plan-2018>

From March 27th to 30th, the Bermuda National Trust hosted over 80 international delegates for the **International Conference of National Trusts**.

On Wednesday June 5th a memorandum of understanding was signed between the Bermuda Government, Bermuda Institute of Ocean Sciences and the Waitt Foundation to launch the **Bermuda Ocean Prosperity Programme**. An output of the programme will be a marine spatial plan for Bermuda's 200 mile EEZ, completed by 2021

From July 16th to 22nd a team from the DENR and Chester Zoo released **14,000 *Poecilonites bermudensis* land snails** raised at Chester Zoo to establish **new populations of this endemic species** in Bermuda. The snails were released on an island at the East end, and with support from the National Trust, on the BNT's Morgan's Island nature reserve.

Category 3 Hurricane Humberto passed about 75 miles west of Bermuda on the night of Wednesday September 18th. Tropical Storm Jerry followed on September 25th.

On November 12th Government advised the public that a small aircraft would be flying at around 300m over the island in November as water depth and land elevation data are being captured to **update Bermuda's aerial imagery and nautical charts**. The project is a partnership between the Bermuda Government and the UK Hydrographic Office (UKHO) Overseas Territories Seabed Mapping Programme.



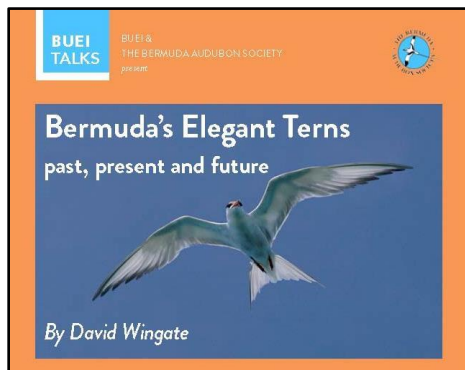
JANUARY 2019

Christmas Bird Count Week is December 26th 2018 to January 1st 2019. [The count itself is **BSAP item E3.8** and K3.5 as data is collected by the public.] <http://www.audubon.bm/news/newsletters/228-vol-29-no-4-fallwinter-2018>

The Bermuda Audubon Society held a **volunteer work party** and nature walk at the Alfred Blackburn Smith Nature Reserve on January 12th. Volunteers cleared invasive Casuarina from the coastal forest and removed invasive overgrowth covering the path to the reserve gate on South Shore Road. [E1.3 habitat restoration, E1.4 culling and planting, F3.3, I3 PA mgt].

The West End Development Corporation (WEDCO) landscape staff **installed signs** giving the common and botanical **names of plants** used in the landscaping around Dockyard in January. The project is in response to queries from visitors about the names of plants, and is also part of an education programme for the landscapers. [C5 landscapers, D2 awareness]. <http://bernews.com/2019/01/photos-signage-highlights-dockyard-plant-life/>

Dr. David Wingate and Erich Hetzel presented a talk on the **Bermuda Tern Recovery Project** at the BUEI auditorium on January 28th entitled '**Bermuda's Elegant Terns: past, present and future**'. Dr. Wingate gave a background on the historical records of tern species in Bermuda, including some historical readings by Dr. Gordon Campbell, which gave perspective on the current tern population. Dr. Wingate showed 60 years of trend data on the declining number of **Common Tern** pairs and chicks and the impact of hurricanes. He also shared the exciting news that a single pair of **Roseate Terns** nested in Bermuda in 2018, a first for this species in 170 years. [A2.4 lecture, K3.5 community data gathering].



Tern Lecture Poster (BUEI)

In January **Sol Petroleum** donated **\$5,000** to the **Ocean Academy** marine education programme at the Bermuda Institute of Ocean Sciences (BIOS). [C3.11, C3.10 outdoor learning, L5].

- <http://www.royalgazette.com/environment/article/20190114/ocean-academy-gets-5000-boost-from-sol>
- <http://bernews.com/2019/01/sol-donates-to-bios-ocean-academy-program/>

The Hamilton Princess and Beach Club announced in January that they had purchased **10,802 pounds of seafood from Bermudian fishermen** in 2018, up from 6,634 pounds in 2017. The boost is the result of a commitment by the hotel in 2018 to highlight local ingredients in its restaurants and support local farms and fishermen industries. [D2.7 role of consumer choice, E5.7 sustainable agriculture, E10.14 hotels, D3.7]. <http://www.royalgazette.com/news/article/20190111/hamilton-princess-commits-to-fishing-industry>

On the morning of January 10th a female Cahow laid an egg in the nest on Nonsuch Island fitted with the **CahowCam**. The nest video stream can be viewed here: <https://youtu.be/gTcbYff8ac> . [D2].

- <http://www.royalgazette.com/environment/article/20190111/first-cahow-egg-for-season-laid>
- <http://bernews.com/2019/01/video-cahow-lays-egg-to-start-2019-season/>

On January 23rd a **juvenile short-fin pilot whale** was reported washed ashore at Devonshire Dock on North Shore. The carcass was recovered by BAMZ staff, a necropsy was performed, histological samples were taken for analysis and the remains will be preserved for education. [E3.7 NHM specimen, B4.10 contact]. <http://bernews.com/2019/01/photosvideo-dead-whale-removed-from-dock/>

Bermuda's 5th annual **Winter lionfish derby** was held during the month of January. 67 lionfish hunters caught 849 lionfish during the month-long tournament. A social evening and prize giving was held at BAMZ to celebrate. [J.1, K3.4 research invasives, K3.5 volunteers collect data, K6.1 invasive sp., D.4 communication, D4.2 feral animal control, K1.7, E3 community monitoring, A2.5 social event].

- <http://www.royalgazette.com/environment/article/20190208/divers-hunt-lionfish>
- <http://www.royalgazette.com/environment/article/20190108/winter-lionfish-hunt-under-way>
- <http://bernews.com/2019/02/photos-849-lionfish-caught-in-winter-derby/>

Ongoing biosecurity concerns with imported bananas containing mealybugs and scale insect pests, led to increased inspections by the Plant Protection Lab throughout 2019. [D4 invasive sp., K6.1 overseas data, B4.11 spp. imports, D2.7 consumer choice, B4.5, D4.4]. <http://bernews.com/2019/11/banana-price-increase-due-to-inspection-cost/>



Mealybug on imported banana (DENR)

FEBRUARY 2019

Senior Marine Conservation Officer Dr. Sarah Manuel and Natural History Museum Curator Dr. Robbie Smith attended the **UKOTs Coral Reef Initiative workshop** in Anguilla from February 4th to 7th. The meeting hosted by JNCC and the Government of Anguilla, aimed to formulate coral reef action plans for the UK Overseas Territories. [A3.2 workshop, A3.4 collaboration, A3.5, J1 mgt plan].

A **returning Longtail** was reported on February 7th, thought to be the first for the year. [E3 comm. data].

The Bermuda Audubon Society held a **tour of Sear's Cave Nature Reserve** for members on February 10th. After visiting the cave, participants moved into the woodland for bird watching. [C3.10 field trip].

In February, about 4,000 **greater Bermuda land snails** (*Poecilozonites bermudensis*) were brought to Bermuda from the UK. These snails are the descendants of *P. bermudensis* sent to ZSL in 2014, and later Chester Zoo, for **captive breeding**. The snails were **tagged and released** in the quarry at Nonsuch Island and on Hall's Island. This is the first reintroduction of this endemic snail from stock bred in the UK, but further introductions are planned. [J1, J3 ex situ, J3.11, K4 reintro, A4.3, A3.4].

- <https://www.gov.bm/articles/4000-endemic-bermuda-land-snails-repatriated-bermuda>
- <http://www.royalgazette.com/environment/article/20190211/rare-snail-returns-to-island>



A tagged greater Bermuda land snail on Nonsuch Island (Alison Copeland)

In February and April 2019, Monica Silva and Letizia Campioni (MARE-ISPA, Portugal) were in Bermuda conducting a research project on Cahows. <https://www.speciesconservation.org/case-studies-projects/bermuda-petrel/20049>. On February 11th, the two visitors, along with JP Rouja (Nonsuch Expeditions) and Jeremy Madeiros (DENR), presented a public lecture highlighting recent developments from all of their cahow projects [A2.4 lecture, K1.7 researchers]. <http://bernews.com/2019/02/feb-11-buei-talks-to-host-cahow-season-2019/>

Staff from the Cornell Lab of Ornithology were in Bermuda from February 11th to work with Nonsuch Island Expeditions and Look Bermuda on the Nonsuch Island CahowCam. [A3.4 collaboration, D2, L4.3 funding]. http://cams.allaboutbirds.org/channel/53/Bermuda_Cahows/

The BZS held several '**Weekend Warrior**' work parties on Saturdays in February and March at **Trunk Island**. Volunteers cut and chipped invasive vegetation to make way for endemic trees to be planted by corporate volunteer work parties at a later date. [E1.3 habitat, E1.4 cull and plant, C7.3 land mgt, I3 PA mgt].

Gardeners were able to purchase native and endemic plants, vegetables and vegetable plants, and ornamental species at the **Bermuda National Trust's annual plant sale** on February 16th. [E2.4] <http://bernews.com/2019/02/video-bnt-plant-bake-sale/>

The Bermuda Audubon Society held a **workshop** for members on how to use the online tools at the Cornell Lab of Ornithology's website www.ebird.org to construct lists of bird species seen. The hands-on workshop trained a number of Bermuda's birders to contribute to this valuable **online source of citizen-science data**. [A2.4 workshop, K3.5 volunteer data, E3 reporting].

Wayne Ledwell from [Whale Release and Strandings](#), a non-profit in Newfoundland, Canada, was in Bermuda in February to teach techniques to free entangled whales. An article on the course appeared in the spring Envirotalk and can be read [here](#). While in Bermuda, he also gave a public lecture on his decades of work freeing entangled whales and turtles [A3.4, A2.4 workshop, J4, C7 training, H3 training enforcement officers]. <http://bernews.com/2019/02/helping-entangled-stranded-whales-sea-turtles/>



Entanglement workshop participants (Roma Hayward)

On February 19th Paul Watson gave a lecture entitled '**Bird Banding: Hobby or Obsession**' at BAMZ. the talk explained Paul's own experiences banding both resident and migratory birds, and the importance of such programmes for conservation. [K3.5 comm spp. data, E3 comm data, E3.5photo, A2.4 lecture].

During the last week of February, the DENR hosted a visit by Gillian Key, the Overseas Territories Project Manager for the Great Britain Non-native Species Secretariat (GBNNS). The GBNNS is running a four-year project on **biosecurity in the Overseas Territories** (project website: <http://www.nonnativespecies.org/index.cfm?pageid=619>). [K6.1, B4.5, B4.11, D4.4, A3.4, D4].



Biosecurity project participants at the Hamilton cargo docks (Alison Copeland)

MARCH 2019

The public consultation period for the **Draft Bermuda Plan 2018** ran from December 3rd, 2018 until March 15th 2019. [A2.6 ngo input, I1.6 protected areas, **I2.4 update zonings**, I4.3, I4.5 new procedures].

- <https://www.gov.bm/draft-bermuda-plan-2018>
- <http://bernews.com/2019/02/development-community-conservation-strategy/>

Between January 18th and March 4th 2019, 27 immature **Governor Laffan's Ferns were reintroduced** to the wild at 3 nature reserve sites. The ferns were propagated at the Henry Doorly Zoo in Omaha, Nebraska then transported to Bermuda to be raised at the DENR until they reached planting size. Despite an active hurricane season, 56% of the plantings survived until the end of the year. These activities were called for in the species recovery plan for protected ferns. [J1 sp plan, J1.3 implementation, J2, J3 ex situ, J3.11 reintroduction, I reserve restoration]. [Linked report](#).

The **Cahow breeding season report** for 2018 was published online by the DENR on March 8th. A record 124 breeding pairs produced 71 successfully fledged chicks last year. [J1.3 implement plan, K1.5 gov priority, A3.4, D3.7 success, J2.3 gov adopted plan, J2.5 report]. <https://environment.us11.listmanage.com/track/click?u=506476588287aa7782ad7ba90&id=7f63d9e67a&e=21370acba8>

A lecture entitled “**Conservation and Restoration of Rare Plants: Why it matters to each of us**” presented by Mrs. Marge From, Director of Plant Conservation at Omaha’s Henry Doorly Zoo and Aquarium; was held at the BAMZ classroom on Wednesday March 13th. Mrs. From was in Bermuda to deliver a shipment of in-vitro Governor Laffan’s Ferns, and gave the lecture on behalf of the Bermuda Botanical Society. [A2.4 lecture].

On March 19th a **female Grey Seal** was found by members of the public at Tobacco Bay and transported to BAMZ wildlife rehabilitation centre. This is the first recorded appearance of a Grey Seal in Bermuda waters. On April 10th the seal, nicknamed **Lou-Seal**, was flown by Cargo Jet Ltd. to the US and transported to the Mystic Aquarium in Connecticut for further rehab. She was fitted with a satellite tag, and released at Charlestown Rhode Island on May 30th. [J4 rehab, A3.4, D3.7].

- <http://www.royalgazette.com/environment/article/20190319/seal-discovered-ashore-at-east-end>
- <http://bernews.com/2019/03/grey-seal-currently-being-observed-cared-for/>
- <http://bernews.com/2019/03/live-video-seal-found-east-end/>
- <http://bernews.com/2019/04/bamz-rehab-team-continue-caring-for-seal/>
- <http://www.royalgazette.com/news/article/20190413/you-picked-fine-time-to-leave-us-lou-seal>
- <http://bernews.com/2019/04/lou-seal-transported-to-usa-for-further-care/>
- <http://www.royalgazette.com/news/article/20190502/lou-seal-settles-in-to-new-home-in-america>
- <http://bernews.com/2019/05/video-lou-seal-released-back-into-ocean/>

In a press release in late March, the DENR reminded the public that it is an offence under the Protected Species Act 2003 to harass humpback whales, and reiterated the **government guidance on responsible whale watching**, including a warning not to swim with whales. [E1.7 responsible boating, D3.4 reporting, D3.3, D3.6 media, K5.6 recreational].

- <https://environment.bm/whale-watching-guidelines?rq=whale%20watching>
- <http://www.royalgazette.com/environment/article/20190409/warning-do-not-swim-with-whales>
- <http://bernews.com/2019/04/govt-please-do-not-swim-with-the-whales/>
- <https://www.gov.bm/articles/advisory-whale-watching>

From March 27th to 30th, the Bermuda National Trust hosted over 80 international delegates from 35 countries for the **International Conference of National Trusts**. The programme (<http://cloudfront.bernews.com/wp-content/uploads/2019/02/ARMS-WIDE-OPEN-PROGRAMME.pdf>) included lectures and field trips around the island. A regional meeting of Caribbean National Trusts also took place within the larger event. [A3.2 conference, A3.4, A2.5 social event, A3.5 int’l event].

- <http://bernews.com/2019/03/18th-international-conference-national-trusts/>
- <http://bernews.com/2019/02/over-100-guests-from-37-nations-expected/>
- <https://www.facebook.com/GovtHouseBDA/videos/2324846251129924/?t=0>
- <https://www.facebook.com/BermudaNationalTrust/videos/682738552143954/?t=4>
- <https://www.facebook.com/william.k.white.90/videos/10158616441932575/?t=0>



The [Spring 2019 edition of the Envirotalk newsletter](#) was published on March 29th. It contained articles on the recent biosecurity visit, the whale entanglement workshop, the winter lionfish tournament and the seasonal fisheries closures. [D2.1 articles, D7.4, D7.2, D2.5 online content, E8.1 dates, E5.3 fishing notices, J5.1 support].

Bermuda joined countries around the world in turning off unnecessary lights and electronic devices for one hour on March 30th to mark **Earth Hour**. Local celebrations were led by Greenrock, and supported by the Bermuda Electric Light Company (BELCO), and a number of local businesses. A 5K glow-in-the-dark walk and run was organised by Greenrock in dockyard this year. [E8.1 dates, D9.2 festival, D2.7 consumer, A2.5 social event].

- <http://www.royalgazette.com/environment/article/20190403/greenrock-pleased-with-earth-hour-turnout>
- <http://www.royalgazette.com/environment/article/20190301/earth-hour-activities-announced>
- <http://bernews.com/2019/04/fairmont-southamptons-earth-hour-initiatives/>
- <http://bernews.com/2019/04/photos-greenrock-host-earth-hour-campaign/>
- <http://bernews.com/2019/03/belco-supports-earth-hour/>
- <http://bernews.com/2019/03/greenrock-launches-earth-hour-campaign/>

On March 31st the Bermuda Audubon Society urged residents and cat owners to help keep birds safe after a **Baltimore Oriole**, injured by a cat, died at the rehabilitation facility at BAMZ [E2.7 cat ownership, J4.1 vet facility].

APRIL 2019

On Thursday, April 4th the Bermuda National Trust held its annual **Children's Nature Walk at Spittal Pond**. [D5 regulations to children, C3.10 outdoor teaching, D9 event].

- <http://www.royalgazette.com/environment/article/20190403/learn-about-environment-at-spittal-pond>
- <http://bernews.com/2019/04/childrens-spittal-pond-nature-walk-tomorrow/>

The Bermuda Audubon Society reported several sightings of a **Swallow-tailed Kite** in Southampton and Warwick, beginning on April 5th. Many good photographs were shared on social media including some of a bird carrying a large lizard. [K3.5 community spp data, E3 comm data].

On April 7th, David Wingate and a team of Audubon Society volunteers deployed a flock of **tern decoys** on **Pearl and Lambda Islands** with the hope of attracting terns to nest on these islands instead of on the precarious buoys that they have used previously. [K3.1, D2.2, D3.7 success story, D10.7 no landing sign, E1.7 boating, K2.2 key site]. http://www.audubon.bm/images/pdf/Newsletters/Vol_30_No3_2019.pdf



Decoys on Pearl Island (Alison Copeland)

Passion Fields Maintenance and Beekeeping Ltd. Offered an 8-week **course for beginner beekeepers** in April. The course was designed to teach the public how to keep their own bee hives, as well as highlighting the role of bees in the environment. [E5.5 industries, E5.7 agriculture, C4, E5.6].

<http://bernews.com/2019/02/8-week-beekeeping-course-beginning-april/>

Photographer Andrew Stevenson reported that he now has a catalogue of over **1650 individual whale IDs recorded in Bermuda** over the last 13 years. He told the media in April that he already had over 200 whales identified for 2019. His documentary film 'Secret Lives of the Humpbacks' was shown at the Specialty Cinema on April 10th. [A2.4, E5.2 art, E3 community data, K3.5 volunteer data].

- <http://www.royalgazette.com/environment/article/20190315/humpbacks-film-to-get-third-screening>
- <http://www.royalgazette.com/environment/article/20190219/bermuda-is-for-lovers-in-whale-community>
- <http://bernews.com/2019/04/stevenson-over-200-whales-identified-so-far/>
- <http://bernews.com/2019/02/secret-lives-humpbacks-tomorrow/>

The Bermuda **Report on the Convention on Migratory Species (CMS)** was submitted to the UK on April 11th with input from the Department of Environment and Natural Resources, and the Bermuda Audubon Society. The Bermuda information will be included in the **UK's national report to the CMS secretariat**, along with contributions from the other UKOTs and UK home countries. The report will be published ahead of the 13th Conference of Parties (CMS COP13) in India in February 2020. [A3.3 int'l agreements, A3.5, A3.4]. <https://www.cms.int/en/meeting/thirteenth-meeting-conference-parties-cms>

On April 11th Shane Antonion gave a public lecture for the BZS on marine plastic pollution entitled '**Microplastics and Bermuda's beaches.**' [A2.4 lecture, K1.7 researchers].

<http://www.royalgazette.com/environment/article/20190412/plastics-dangers-from-hand-to-sea-to-mouth>



Microplastics on a Bermuda beach (Alison Copeland)

The Department of Health announced that **sea water quality testing at the island's bathing beaches** had begun in April and would continue into the autumn with the results posted to www.gov.bm/seawater-monitoring-programme-bathing-beaches. [K5 water quality, K6 potential threats, K5.5 sewage monitoring].

On April 12th an article in the Royal Gazette made the public aware that **honey bees swarm** to establish new colonies in the springtime, and that beekeepers will remove swarms free of charge. Jonathan Hitchcock of Wild Island Apiaries was interviewed, and encouraged the public to call a beekeeper, not an exterminator to deal with swarms. He noted that the Government's importation of **varroa mite resistant** queen bees several years ago, coupled with mild weather in 2017 and 18, have brought Bermuda's honey bee population back to a better state. [E5.5 industries, E5.7 agriculture, D4 IAS]. <http://www.royalgazette.com/environment/article/20190412/island-may-have-turned-corner-on-bee-numbers>



Feral honeybees on a fallen cedar (Alison Copeland)

The 80th annual **Agricultural Exhibition (Ag Show)** took place at the Botanical Gardens from April 11th to 13th showcasing Bermuda-grown plants and produce, farm animals, baked goods and crafts. [E5.5 cottage industry, F6 awards, **C3.9 exhibition**, D9.2 existing events, E7.3 youth].

- <http://www.royalgazette.com/news/article/20190413/thousands-flock-to-show/8>
- <http://www.royalgazette.com/news/article/20190412/clearing-skies-usher-in-2019-ag-show>

- <http://bernews.com/2019/04/live-video-ag-show/>
- <http://bernews.com/2019/04/photos-plant-exhibits-2019-ag-show/>

The Bermuda Botanical Society set up a **display of endemic and native plant species** in the JJ Outerbridge Building during the Ag Show, which attracted attention and conversation. The display included information sheets and potted examples of plants such as Snowberry, Bermudiana, Rhacomia and Yellowwood. [J3, C3.9 display at exhibition, D9.2, E5, E2.5].



The Botanical Society display at the Ag Show (Photo: Jennifer Flood)

The Bermuda National Trust's annual **Palm Sunday walk** took place in Somerset this year. Walkers began at Cross Island and toured the Royal Naval Cemetery [D9 public event].

- <http://www.royalgazette.com/environment/article/20190415/west-end-walkers-explore-hidden-parts>
- <http://bernews.com/2019/04/photosvideo-national-trust-palm-sunday-walk/>

On April 15th the Department of Health announced that more than 300 people had attended its **'Eat, Grow, Save' home gardening workshops** over the last 2 years. The latest workshop included presentations from farmers on transplanting seedlings and one from the DENR on pest control and insecticides. [E5.6 gardening seminars].

- <http://www.royalgazette.com/environment/article/20190415/hundreds-hone-their-gardening-skills>
- <http://bernews.com/2019/04/over-300-complete-grow-eat-save-workshops/>
- <https://www.gov.bm/articles/grow-eat-save-graduation>

On April 16th the Bermuda Audubon Society held a workshop on how to use the **NestWatch** tool to monitor the breeding success of the birds in your bluebird box. www.nestwatch.org [E2.8 and E3.2 bluebird boxes, K3.5 citizen science].

To mark **Earth Day** on April 22nd the Bermuda Tourism Authority unveiled a **mural** by Bermudian artist Meredith Andrews at the Hamilton Visitor Services Centre. The art piece was made completely from **marine plastic debris** and highlighted the problem of marine pollution. Also, the boutique &Partners hosted a **pop up exhibition** of Meredith Andrews other work with marine plastics. Part proceeds from the exhibition, entitled Flotsam, were donated to Keep Bermuda Beautiful. [E8.1 dates, E8.2 int'l day, D2.7 consumer, **E5.2 art**].

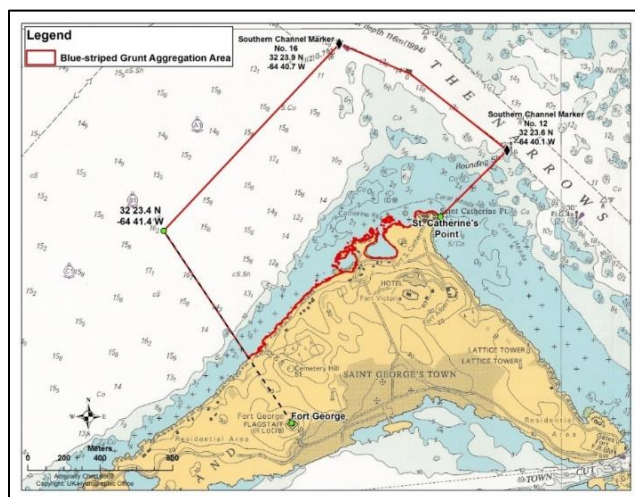
- <http://bernews.com/2019/04/mural-highlights-importance-of-healthy-oceans/>
- <http://www.royalgazette.com/environment/article/20190626/single-use-plastics-artwork-for-earth-day>

On April 23rd a **Longtail chick hatched** in the nest burrow outfitted with a live-streaming camera on Nonsuch Island. [D2, A3.4 collaboration + technology, L4.3 overseas funding, C].

- <http://www.royalgazette.com/environment/article/20190425/longtail-chick-hatches-on-camera>
- <http://www.royalgazette.com/environment/article/20190418/watch-longtail-chick-hatch>
- <http://bernews.com/2019/04/longtail-hatching-seen-live-new-webcam/>

On April 25th the final lecture of the Eco Lunch and Learn Series co-hosted by BEST and the Bermuda College was presented by farmer Tom Wadson. The lecture entitled '**Improvements in agriculture in Bermuda in the last 50 years**' discussed developments in farming practice and food sustainability. [A2.4 lecture, A3.4 collaboration]. <http://bernews.com/2019/04/final-lecture-of-eco-lunch-learn-series/>

On April 26th the Minister responsible for the Environment and the DENR issued a **fisheries notice** (Pursuant to section 4A of the Fisheries Act 1972), closing an area of north shore near St. Catherine's Point to fishing. The closure took effect on May 1st and remained in place until June 30th, to **protect an aggregation of Blue-striped grunt**. [D3.2, D3.3 news, D3.4, E5.3 fishermen, G3, J5.1 harvested, J5.2 update]. <https://www.gov.bm/theofficialgazette/notices/gn05452019>



Map of Blue-striped Grunt fisheries closure area (DENR)

The Department of Environment and Natural Resources issued a press release on April 29th advising the public not to open **drums or containers found washed ashore** as they may contain hazardous substances. [K5].

- <http://www.royalgazette.com/news/article/20190429/warning-on-objects-washing-ashore>

- <http://bernews.com/2019/04/please-report-sealed-containers-found-on-shore/>
- <https://www.gov.bm/articles/all-sealed-containers-liquid-found-washed-shore-should-be-reported>

Bermuda received a large influx of **Sargassum seaweed** at the end of April. The Natural History Museum at BAMZ stated in a press release that they were collaborating with the researchers aboard the Sea Education Association's *Corwith Cramer* to study whether the variety of *Sargassum natans* that had washed ashore in large quantities in the Caribbean in recent years was present in Bermuda. [A3.4 collaboration, K2.1 critical habitat, K3.1 poorly studied taxa].

<http://www.royalgazette.com/environment/article/20190427/researchers-checking-if-seaweed-is-threat>

A scientific paper was published in April in the Environmental Biology of Fishes entitled '**the life history characteristics of invasive lionfish *Pterois volitans* and *Pterois miles* in Bermuda**'. The publication resulted in a press article on April 18th informing the public that lionfish grow faster and larger in Bermuda than elsewhere, but have great challenges breeding due to Bermuda's cooler water. The paper can be read [here](http://www.royalgazette.com/environment/article/20190418/local-lionfish-grow-faster-and-larger). [D4, J5, K3.1]. <http://www.royalgazette.com/environment/article/20190418/local-lionfish-grow-faster-and-larger>

MAY 2019

On May 4th the Bermuda Audubon Society celebrated the **Global Big Day** with an early morning birding trip to Spittal Pond. In the afternoon, members visited Nonsuch Island for a picnic and Cahow encounter. [E8.2 international day event, K3.5, community spp data, E3 comm data].

In 2018 the DENR in collaboration with Florida International University began a study using exclusion **cages in seagrass beds in Riddell's Bay**. The cages were disassembled during the first week of May 2019. [K6.2, K2.2 monitoring, K2.1 habitat, K1.7, K1.5, A3.4].

Bermuda charity **Ocean Tech** held information sessions at the Bermuda Aquarium Museum and Zoo (BAMZ) on May 6th and 7th to introduce the **Remus 100 autonomous underwater vehicle (AUV)** to local stakeholders. The AUV will arrive later in 2019 and offer ocean exploration capabilities to Bermuda-based users. <http://www.oceantech.global>. [L5, L6, A3.4, A2.5, D2].

- <http://www.royalgazette.com/environment/article/20190517/robot-reveals-hidden-depths-of-islands-seas>
- <http://bernews.com/2019/05/ocean-tech-name-robot-video-competition/>

On May 10th Minister Roban spoke in the House of Assembly about ongoing work to make the **planning process more efficient**. He noted the EnerGov system, allowing an automated paper-less workflow would be operational later in the year. The Department of Planning will also be reviewing policies and practices, and undertaking public outreach clinics. [H1 procedure review, H2].

<https://www.gov.bm/articles/streamlining-planning-processes>

Bermuda College announced that its graduation ceremony on May 16th would be a **balloon-free event**. The college was awarded an Eco-schools green flag and has committed to promoting environmentally

sustainable behaviours. [E10.9 balloons, D9 public event, E7.3 youth]
<http://bernews.com/2019/05/college-to-have-balloon-free-graduation/>

From May 17th to 21st the **Ocean Plastics Leadership Summit** was held aboard the Royal Canadian Geographical Society's vessel *Resolute* in St. Georges harbour. The seagoing conference was organised by SoulBuffalo. Attendees included representatives of NGO's, scientists, and business and industry professionals, especially from companies which manufacture plastics. An article about the conference appeared in the August issue of Outside Magazine. [A3.2 conference, E10 private sector, F2].

- <http://bernews.com/2019/05/photos-ships-visiting-st-georges-harbour/>
- <http://bernews.com/2019/08/magazine-reports-bermuda-plastics-summit/>
- <https://www.outsideonline.com/2400590/ocean-plastic-pollution-soulbuffalo>

The **documentary film 'Requiem'** was selected for the British Documentary Film Festival in London. The film by Alex Godfrey, chronicles the **disappearance of sharks in Bermuda's waters**. [D2].
<http://bernews.com/2019/05/requiem-selected-british-film-festival/>

Subtropical storm Andrea became the first named storm of the year on May 20th.
<http://bernews.com/2019/05/subtropical-storm-andrea-forms-atlantic/>

On May 22nd Minister Roban encouraged the public and businesses running beach concessions to re-think the use of **single use plastic** items, like plates, cups and cutlery. He also asked beach and park users to **dispose of litter properly**. [D2.7 consumer choice, E10.7 retailers, E10.16 beach concessions, D10.6].

- <http://www.royalgazette.com/environment/article/20190522/roban-think-twice-on-single-use-plastics>
- <http://bernews.com/2019/05/think-twice-before-using-single-use-plastics/>
- <https://www.gov.bm/articles/consider-non-plastic-items-during-bermuda-day-holiday>

Mr. Dan Gribbin, a visiting photographer from Florida, presented a slideshow of bird images captured in both Florida and Bermuda. His talk, entitled "**Longtails, Oystercatchers, and Other Shorebirds**" was part of the BZS lecture series on May 29th. [A2.4 lecture].

JUNE 2019

Onshore winds brought a large amount of **Sargassum** onto the beaches in June. [K6.1 regional trend].

- <http://www.royalgazette.com/environment/article/20190604/expert-large-amount-of-seaweed-not-unusual>
- <http://www.royalgazette.com/environment/article/20190619/seaweed-proves-difficult-to-tackle>
- <http://bernews.com/2019/06/crews-working-remove-sargassum-seaweed/>
- <https://www.gov.bm/articles/department-environment-and-natural-resources-addresses-large-quantities-sargassum-seaweed>

A man was **fined** \$500 for stealing 25lbs of sweet potatoes from a farmer, after being photographed by a Government officer in the field. <http://www.royalgazette.com/court/article/20190608/man-fined-500-for-stealing-sweet-potatoes> [F1 fines, H1 enforcement powers, E5.7 agriculture].

Photographs taken in Bermuda by photographers David Liittschwager and David Doublet appeared in the June edition of **National Geographic magazine**. They accompanied an article by James Prosek, which documented activities to protect the **Sargasso Sea**. [D2.1 magazine, E3.5 photographer].
<https://www.nationalgeographic.com/magazine/2019/06/sargasso-sea-north-atlantic-gyre-supports-ocean-life/>

Nonsuch Expeditions **launched a fourth live camera on Nonsuch Island** on World Environment Day. The new camera is an above ground surface view of translocated cahow colony A, and captured a chick named Cedar fledging on the night of June 7th. [D2.2, E3.5 photographers, E8.2, A3.4].

- <http://bernews.com/2019/06/fourth-live-cam-launched-on-nonsuch-island/>.
- <http://www.royalgazette.com/environment/article/20190607/cahow-chick-rare-footage>
- <http://www.royalgazette.com/environment/article/20190605/cahow-chicks-maiden-flight-to-air-on-camera>
- <http://bernews.com/2019/06/cahowcam-chick-fledged/>
- <http://bernews.com/2019/06/holographic-display-created-of-cahow-bird/>

In a statement marking both **World Environment Day (June 5th)** and **World Oceans Day (June 8th)**, the Minister responsible for the environment, Home Affairs Minister Walter Roban, highlighted some of the **Governments ongoing environmental initiatives** including:

1. Developing new legislation on invasive species
2. Eliminating single-use plastics
3. Revamping the Endangered Animals and Plants Act 2006 to better implement CITES
4. Incorporating green infrastructure, improved walkability and climate resilience into the Draft Bermuda Plan
5. The LED bulb exchange initiative
6. Encouraging aquaculture
7. Launching the Bermuda Ocean Prosperity Programme

[E8.1 int'l date, E8.2, F2 plastic and bulbs, G1 int'l obligations, G2 legislation review, G3, J5 fishery, A3.4, F4.6 walkability, I2.4, E10 plastic].

- <http://bernews.com/2019/06/world-environment-day-world-ocean-day/>
- <https://www.gov.bm/articles/ministry-home-affairs-celebrates-world-environment-day>

On Wednesday June 5th a memorandum of understanding was signed between the Bermuda Government, Bermuda Institute of Ocean Sciences and the Waitt Foundation to launch the **Bermuda Ocean Prosperity Programme**. An output of the programme will be a marine spatial plan for Bermuda's 200 mile EEZ, completed by 2021. Stakeholders attended a reception at BAMZ in the evening to celebrate the launch of the programme and World Environment Day. [E8.2 int'l day activity, A3.4 collaboration, A2.5 social event, A2.6, B1, B4 govt, C7.4 GIS, E1.7 boating, E5.3 fishing, H4.1, H4.2, I1.1. I2.4 mpa, I2 coverage, I3 mpa mgt, I4, J1 plans, J5 economically important, K1.3, K1.5, K3.3 econ important, K6, L4].

- Minister Walter Roban’s comments from the MOU signing can be read here: <https://www.gov.bm/articles/ministry-home-affairs-partners-waitt-institute-and-bios-unveil-bermuda-ocean-prosperity>
- <https://www.waittinstitute.org/bermuda>
- <http://bernews.com/2019/06/bermuda-ocean-prosperity-programme-formed/>
- <http://www.royalgazette.com/environment/article/20190606/film-highlights-marine-efforts>
- <http://www.royalgazette.com/news/article/20190605/marine-sanctuary-planned-for-island>
- <http://bernews.com/2019/06/leonardo-dicaprio-highlights-bermudian-initiative/>



MOU Signatories (L-R) Dr. William Curry (BIOS), Minister Walter Roban (Bermuda Government) and Mr. Ted Waitt (Waitt Institute). (Photo: Waitt Institute).

The Catholic Diocese of Bermuda recognised **Stuart Hayward’s** many contributions to protecting Bermuda’s environment when he was presented with the **Peace and Justice Award** in a ceremony on June 6th. [D3.7, E6 religious leaders, F6.3 indiv contributions].

- <http://www.royalgazette.com/environment/article/20190523/catholic-church-honours-hayward>
- <http://www.royalgazette.com/news/article/20190613/captain-bermuda-honoured-by-catholic-church>

On June 13th an article on the reintroduction of *Poecilonites bermudensis* appeared on the BBC website, and was picked up by various online news outlets. The reintroduction in February was a collaboration between Chester Zoo and the Bermuda Department of Environment and Natural Resources. [D2.2 newspaper, A2.4]. Some of the articles:

- The original article: <https://www.bbc.com/news/science-environment-48527398>
- <https://www.bbc.co.uk/newsround/48611337>
- <http://www.msn.com/en-xl/latinamerica/latinamerica-top-stories/bermuda-land-snail-zoo-releases-4000-rare-snails-considered-extinct-into-the-wild-after-conservation-project/ar>

[AACPgAx?ocid=spartanntp&fbclid=IwAR0R2_1Ucl5y9eWt7LXCpl295gMKvva5LQ9_n-oUL7NUVokMH3UsEy43ZXI#image=1](https://www.chesterzoo.org/news/thousands-of-rare-snails-return-to-the-wild/)

- <https://www.chesterzoo.org/news/thousands-of-rare-snails-return-to-the-wild/>

At a launch event on June 18th the Bermuda Underwater Exploration Institute announced that they had partnered with Greenrock to take over delivery of the **Eco-schools Programme**, which Greenrock had operated for the past 6 years. BUEI are now the official FEE partner in Bermuda. The programme has successfully engaged 300 students from 22 schools under Greenock’s leadership. [C3.11 BUEI, E7, C2, C3]. <http://bernews.com/2019/06/buei-taking-over-eco-schools-bermuda-initiative/>

The **Bermuda National Trust’s annual awards** were presented at Whitney Institute on June 18th. A number of individuals were recognized for their service to the Trust, and awards were given for architecture, preservation and cultural awareness. The environmental awardees were:

Education – School Programme	Bermuda College	For their aquaponics initiative
Education – School Programme	East End Primary & Heather DeSilva	For Mrs. DeSilva's green initiatives at the school
Education – School Programme	Warwick Academy	For their Warwick Academy Natural History Club
Wee Environmentalist Awards	Devonshire Preschool	For their butterfly garden, trash free lunches and other green initiatives
Deforest Trimmingham (Top Awareness Award)	BE Solar, Greenrock and Etude	For The Bermuda Better Energy Plan
Environment	Lee Petty, Scott Kitson and Venessa Daniels	Landscape design of the front gardens and lawn enhancing the historic boutique hotel, Rosedon
Environment	Adam Harbutt and Jessica Marwick	For enhancements and routinely cleaning trash, large and small, at the Belmont Ferry Stop

[Annual awards F6.1, recognition operational activities F6.2, individual awards F6.3, celebrate youth involvement E7.3, A2.5 social event].

- <http://www.royalgazette.com/environment/article/20190620/awards-handed-out-by-national-trust>
- <http://bernews.com/2019/06/bnt-present-environmental-awareness-awards/>

On June 20th Taylor Gorham gave a talk at BAMZ as part of the BZS lecture series on **reef shark population densities** across the tropics, comparing Bermuda to other countries. Taylor is a Bermudian

PhD candidate at Dalhousie University working with the Global Fingerprint project. [A2.4 lecture, K1.7 researchers].

On June 20th the Bermuda Institute of Ocean Sciences announced that it had taken on 10 **Bermudian interns** through the **Bermuda Program** for the summer of 2019. The students range in age from 16 -30, and include high school students, university students and recent graduates. The students will be working on projects in the field and in the lab with their assigned BIOS faculty mentors. [C3.11, C6, C7].

- <http://bernews.com/2019/06/bios-announces-2019-bermuda-program-interns/>
- <http://www.bios.edu/education/bermuda-program>

On June 29th the Ministry of Legal Affairs and Ministry of Public Works (Parks Dept.) teamed up with community volunteers from the Mirrors Programme and Royal Bermuda Regiment to remove invasive plants and debris from the **Southlands National Park**. Four additional clean-up events from July – November are planned. [E1.4 culling invasives, F3.3 NGO, I3 protected area mgt activity, A3.4,B1.6, E1.5 cleanup, E7.2 youth].

- <http://www.royalgazette.com/environment/article/20190704/praise-for-clean-up-volunteers>
- <http://www.royalgazette.com/environment/article/20190620/southlands-property-to-be-spruced-up>
- <http://bernews.com/2019/07/successful-1st-community-clean-southlands/>
- <http://bernews.com/2019/06/mirrors-department-parks-clean-efforts/>
- <https://www.gov.bm/articles/successful-1st-community-clean-southlands>
- <https://www.gov.bm/articles/mirrors-and-department-parks-partner-sustain-clean-effort-southlands>

JULY 2019

The Bermuda National Trust held a series of **children's summer camps** in July and August, including 'Crack the Code Camp', 'Awesome Trails Camp', 'Pirates, Boats and Forts Camp' and 'Lego Camp'. A suite of other environmental summer camps were held in July and August including the BZS's Aqua Camps and Conservationist Camp at Trunk Island, the BUEI's camps on themes such as sharks, and the deep sea, and the Waterstart programme at Burt's Island. [C2.7, C2.8, C3.11].

On July 3rd, the online Royal Gazette featured a **gallery of bird images** taken at Spittal Pond and photo tips from staff photographer Blaire Simmons. [D2].

<http://www.royalgazette.com/news/article/20190703/birds-eye-view-at-spittal-pond>

In July numerous photos appeared online and in the media of **Spittal Pond which had turned pink** due to a seasonal phytoplankton bloom. A similar bloom took place at Spittal pond in 2015. The appearance of the pond is similar to that of Seymour's Pond which turned pink in the summer of 2012, when dinoflagellates, chrysophytes and bacteria were found in water samples from the pond. [E3 reporting, D2 news]. <http://bernews.com/2019/06/photos-video-spittal-pond-turns-pink/>

In July the results of the **genetic analysis of Bermuda's bait fish populations** was published (Goodbody-Gringley G, Strand E, Pitt JM. 2019. Molecular characterization of nearshore baitfish populations in Bermuda to inform management. PeerJ 7:e7244 <https://doi.org/10.7717/peerj.7244>). The results

indicate that Bermuda's baitfish population is well mixed at the local level, with no genetic isolation between bays; however genes do not flow between Bermuda and the Caribbean. This publication is one of several components of a Darwin-Plus funded study of Bermuda's baitfish led by the Bermuda DENR, BIOS and BZS. [J5.2, K3.1 poorly studied, K3.3 economically important].

<http://www.royalgazette.com/environment/article/20190816/bios-study-into-baitfish-in-bermuda-waters>

On July 4th a **Trindade petrel** was released into the Cahow-cam burrow on Nonsuch Island after being brought to BAMZ by a member of the public, who found it trying to nest at Spittal Pond on July 2nd. This species usually nests in Brazil, but was reported in Bermuda on 6 previous occasions, including earlier this year. The bird was banded and left the burrow on its own on July 6th. [E3.5 photograph, E3 community data].

- <http://www.royalgazette.com/news/article/20190723/bird-from-brazil-drops-in-on-bermuda>
- http://audubon.bm/images/pdf/Newsletters/Vol_30_No2_Summer_2019.pdf

In an **opinion column** appearing on Bernews.com on July 6th, Minister of Home Affairs Walter Roban reflected on the value of Bermuda's marine environment, recent developments in moving Bermuda towards a marine spatial plan, and the need to apply best practice from around the world to Bermuda's blue initiatives. <http://bernews.com/2019/07/column-protecting-managing-bermudas-ocean/>

On July 11th the Epidemiology and Surveillance Unit of the Ministry of Health, and the DENR advised the public in a press release that they were investigating a case of **Ciguatera Fish Poisoning**. The fish involved in the suspected case was a large amberjack. Ciguatera poisoning was rare in Bermuda prior to 2016, but local cases have been reported every year since then [K6 threat monitoring, B4.10 contacts, J5 fish]. <https://www.gov.bm/articles/health-advisory-ciguatera-fish-poisoning-cfp>

On July 18th and 19th the BUEI offered members and the public the opportunity to take a boat trip to look for **Bermuda Fireworms** ('glow worms') performing their summer mating ritual. [C3.10 field trip]. <http://bernews.com/2019/08/bueis-weekend-glow-worm-cruises/>

In July the proposed **subdivision and rezoning of the former Riddell's Bay Golf Course** property generated a number of objections, press articles and an online petition. The Riddell's Bay golf course closed in March 2016. The application to the Department of Planning proposed to subdivide and rezone parcels of land from recreational use to residential and nature reserve. [I4, I4.3, I4.4, A2.6, K6.4].

- <http://www.royalgazette.com/news/article/20190722/riddells-bay-objector-criticises-plan>
- <http://www.royalgazette.com/news/article/20190722/riddells-bay-responds-to-criticism>
- <http://www.royalgazette.com/news/article/20190720/owners-submit-riddells-bay-development-plan>

The Department of Planning launched the **Energov file management system** at the end of July to streamline the planning process, and move the department towards a paperless system. All Planning applications submitted after August 5th should be submitted, tracked and paid through the new system.

- <http://www.royalgazette.com/environment/article/20190729/new-electronic-system-at-planning>
- <https://www.gov.bm/articles/department-planning-launch-new-file-management-system-energov-5-august-2019>

Amber Flewitt, a zookeeper from Chester Zoo, was on the island from July 16th to 22nd working with the DENR biodiversity team. She brought to Bermuda **14,000 *Poecilozonites bermudensis* land snails** raised at Chester Zoo to establish **new populations of this endemic species** in Bermuda. The snails were released on an island at the East End, and with support from the National Trust, on the BNT's Morgan's Island nature reserve. [K4 reintroduction, K3.2 and K3.4 biocontrol and IAS monitoring, K3.1, K1.9 spp. Maps, K1.5 gov't support, K2.1 critical habitat, J3.11 reintroduction, A3.4]
<https://www.facebook.com/BermudaNationalTrust/posts/1932242426876677>



Amber Flewitt (Chester Zoo) and Dr. Mark Outerbridge (DENR) releasing *Poecilozonites bermudensis*. (Photo: Alison Copeland)

A **climate change awareness rally** was held in Hamilton on July 19th, organised by Fridays for Future Bermuda and Greenrock's newly formed Youth Council. The event was held in conjunction with the international movement #FridaysForFuture, which started in Sweden in 2018. Further rallies in Bermuda were held on August 23rd and September 20th. [E7, D9,].

- <http://www.royalgazette.com/news/article/20190720/protesters-there-is-no-planet-b>
- <http://bernews.com/2019/07/video-climate-change-rally-in-hamilton/>
- <http://bernews.com/2019/07/climate-change-rally-july-19/>
- <http://bernews.com/2019/08/teen-environmentalists-plan-climate-rally/>
- <http://bernews.com/2019/09/fridays-for-future-bermuda-climate-change-march/>
- <http://www.royalgazette.com/environment/article/20190920/making-stand-against-climate-change>
- <http://www.royalgazette.com/environment/article/20190917/students-join-global-wave-on-climate-change>

On July 19th the Minister responsible for the environment, Walter Roban, commented on the climate change rally, saying he encouraged everyone to find out about government's environmental initiatives and looked forward to meaningful conversations.

- <http://bernews.com/2019/07/minister-comments-environmentalist-protest/>
- <https://www.gov.bm/articles/minister-home-affairs-comments-environmentalist-protest>

On Wednesday July 24th the **summer edition of the Envirotalk** newsletter was published. It contained articles on keeping ducks out of your pool, keeping giant centipedes out of your house, making seaweed tea for your garden, traveling to Europe after Brexit with your pet, reports of snakes at the beach, and illustrated the species discovered on Bermuda's deep reefs. [K1.7 sharing research, D2.1 articles, D2.5 online content, E8.1 dates, D4 feral animals, E3.7 NH Museum].
https://environment.bm/s/Envirotalk-832-Summer-2019_r.pdf

On July 26th the Ministry of Home Affairs announced that **Ms. Victoria Pereira** had been appointed as **Director of the Department of Planning**. Ms. Pereira holds a Bachelor's Degree in Geography and a professional designation from the Canadian Institute of Planners. She joined the Department of Planning as a Trainee Planner in 2004.

The DENR reduced the number of **recreational spiny lobster diver licences** available for the upcoming 2019/2020 season to a total of 375 available licenses, down from 450 last year. Despite the number of licenses available, only 354 divers obtained licenses last year. The management measure, announced in July, was in response to ongoing concern from the Marine Resources Board that inshore lobster stocks are being overharvested. [J5 marine sp., K3.3, E5.3 fishing practices, K5.6 recreational users].

- <https://www.gov.bm/articles/ministry-home-affairs-sets-cap-375-recreational-lobster-diver-licences-2019-2020-spiny>
- <http://www.royalgazette.com/environment/article/20190731/recreational-lobster-diver-licences-cut>
- <http://www.royalgazette.com/environment/article/20190829/recreational-lobster-fishing-licences-cut>
- <http://bernews.com/2019/07/cap-of-375-recreational-lobster-diver-licences7281/>

Minister Walter Roban urged the public to **eliminate single-use plastic items** from their Cup Match holiday celebrations. He encouraged shoppers and those running food concessions to enquire about alternatives to plastic bags, containers, cups, plates, cutlery and straws [D2.7 consumer choice, E10.7 retailers, E10.16 beach concessions, D10.6, D8.3].

- <http://www.royalgazette.com/environment/article/20190730/robans-plea-on-cup-match-plastics>
- <http://bernews.com/2019/07/consider-alternatives-single-use-plastics/>



Plastic straw on Whalebone Bay beach (Alison Copeland)

AUGUST 2019

The **Bermuda Turtle Project** was active in August, and supplied this summary:

An intense and successful sea turtle research field season concluded in August in conjunction with the Bermuda Turtle Project **23rd In-Water Course** on the Biology and Conservation of Marine Turtles. Young biologists from Argentina, Bermuda, Cuba, Mexico, Portugal, Turks & Caicos Islands and the US studied marine turtle biology and conservation and gained practical experience with in-water turtle research under the leadership and instruction of Jennifer Gray, Dr Daniel R. Evans, Rick Herren, Dr Anne Meylan, Dr Peter Meylan and Dr Gaëlle Roth.

The team deployed a capture net at **seventeen sites** on the Bermuda platform and captured a total of **189 green turtles** from which morphometric data were collected before they were released back onto their capture site. 31% of the turtles captured were already tagged from previous field sessions and we had many long-term recaptures: 4 after 11 years, 1 after 12 years, 1 after 14 years and 1 after 15 years. This information helps us to understand where our sea turtle come from, how long they stay in Bermuda's waters and how they move about the platform.

Two satellite transmitters were deployed this year. A 54.7 cm green turtle named Yertle by our sponsors at AXA XL, was first tagged in Somerset Long Bay in 2012 and captured this year in King Charles' Hole. A 55.9 cm green turtle named Rafael by our sponsors at RenRe, was first tagged in Tuckers Town in 2005 and captured this year at Hawkin's Island. The movements of these two turtles can be tracked live at <https://conserveturtles.org/sea-turtle-tracking-active-sea.../> by simply searching the list of active turtles by their names.

Since 1968 the Bermuda Turtle Project has been studying the little understood juvenile stage of the green turtle. The project is a collaboration between the Bermuda Zoological Society and the Sea Turtle Conservancy, and our work would not be possible without the kind support of many individuals and corporate sponsors. [K3 sp, A3.2, A3.4, E3.9 feedback, C7 training].

<http://bernews.com/2019/08/turtle-projects-2019-field-trip-underway/>

On August 12th Minister of Home Affairs, Walter Roban, announced a **series of clinics** offered to the public by the **Dept. of Planning**. Planners will meet with attendees to answer questions related to applications, permits and processes. The clinics will be held quarterly in future. [D3.8 landowner meetings, F3.1 advice to landowners].

- <https://www.gov.bm/articles/announcement-department-planning-host-free-planning-clinics>
- <http://www.royalgazette.com/politics/article/20190812/planning-department-process-to-be-explained>

Rick Herren, Project Manager for the Sea Turtle Conservancy, gave a public lecture at BAMZ entitled **"Green Sea Turtle Demographics and Habitat Use in Florida's Nearshore Waters"** on Thursday, August 15th. [A2.4 lecture, K1.7 researchers].

The Bermuda Lionfish Taskforce held its annual **Heatwave Lionfish Tournament** on August 18th at Robinson's Marina in Somerset. [K3.4 distrib invasives, K6.1 trends in invasive sp, E1.5 marine clean-up, A2.5 social event, D4 feral control, J1 mgt plan, K3.5 comm spp. data, E3 community data].

<http://bernews.com/2019/07/heatwave-lionfish-tournament-on-august-18/>

In mid-August a **MOTUS bird tracking station** was set up in Bermuda to track tagged birds through a series of stations in North America [K3.1, A3.4, L6, K3, F3.3].

The international conservation organisation **Greenpeace** was in Bermuda for 3 weeks in August, with their vessel *Esperanza* cruising the **Sargasso Sea** to study the impact of plastic and to document the areas unique biodiversity. The voyage is part of Greenpeace’s Pole to Pole expedition aimed at highlighting the threats facing international waters – from the Arctic to the Antarctic – and the urgent need for their protection under a new Global Ocean Treaty. Bermudian graduate student Shane Antonition was among the crew members studying plastic on the *Esperanza*. [E10, L4.3, A3.4, K5.3, D2.7, K6 global trends, A3.3 int’l agreements, I4.7].

- <http://www.royalgazette.com/environment/article/20190814/greenpeace-issues-dire-warning-on-plastics>
- <http://www.royalgazette.com/environment/article/20190813/sargassos-plastics-higher-than-expected>
- <http://www.royalgazette.com/environment/article/20190808/ocean-plastics-under-spotlight>
- <http://www.royalgazette.com/environment/article/20190726/greenpeace-ship-to-visit-st-georges>
- <http://bernews.com/2019/08/greenpeaces-expedition-sargasso-sea/>
- <http://bernews.com/2019/08/nonsuch-expeditions-sargasso-role/>
- <http://bernews.com/2019/09/shailene-woodley-discusses-bermuda-visit/>
- <https://time.com/5667887/shailene-woodley-saving-our-seas/>
- <https://environment.bm/s/Envirotalk-833-Fall-2019.pdf>

On August 12th Greenpeace, in collaboration with the Bermuda Marine Debris Taskforce, Keep Bermuda Beautiful and the Bermuda Government, co-hosted a **public forum** at the World Heritage Centre, where they gave quick results of last week’s trip into the Sargasso Sea, and a panel of local experts and Greenpeace researchers discussed waste management in Bermuda and fielded questions from the 100+ attendees. [D2.7, A3.4, A2.4 lecture, A2.6, E3.9 visiting scientists, K1.7 forum].



Greenpeace’s Esperanza at Pennos Wharf (Shane Antonition)

In August the Department of Health reminded residents to check their properties for **standing water** where **mosquitoes** might be breeding, and to empty containers, plant pots, tires, plastic tarps and other water sources regularly. The Public Health Act requires mosquito control as they are vectors of diseases. [D4.2]. <http://www.royalgazette.com/health/article/20190810/dengue-alert-mosquito-control-advisory-issued>

In August the **Garden Club of Bermuda** presented their **annual scholarship** award to Lucas Bridges, who is studying horticulture at North Carolina State University. Lucas has been training with local farmer Junior Hill of J&J Produce, and wants to return to Bermuda and pursue a career as a farmer. [C6, C7, L]. <http://www.royalgazette.com/news/article/20190826/theres-always-more-to-learn--teen-earns-garden-club-scholarship>

In early August the **Bird Photographer of the Year (BPOTY)** contest organisation announced it was donating £500 to the Bermuda Audubon Society (BAS) towards the Cahow Recovery Programme. The BPOTY website published an article with words and photos by Paul Sterry, telling the story of the Cahow's recovery and inviting BPOTY members to donate funds to the BAS. [L4.1 overseas funding, L4.3,L6].

- https://www.birdpoty.co.uk/conservation-news/bird-photographer-of-the-year-and-the-bermuda-petrel-by-paul-sterry?fbclid=IwAR0X_jeUSfSxeuZCFVBJC1hhNp9ZsNBHPFNo8ifZYMIpu2YJ3Z_UwtBuioo
- <http://bernews.com/2019/08/bpoty-support-bermuda-cahow-initiative/>

On August 15th a press release from the fisheries division of the Department of Environment and Natural Resources advised the public that the red hind aggregation areas were open for fishing. The DENR reminded fishermen that the extended closure boxes within the **seasonally protected areas** will remain closed to all fishing until December 1st to protect black grouper spawning aggregations. [D3, D3.2, D3.3 news, D3.4, E5.3 fishermen, G3, J5.1 harvested, J5.2 update, K3.3]. <https://www.gov.bm/articles/red-hind-ground-opening>

The Bermuda Audubon Society undertook a **tern recovery project** over the summer for both Common and Roseate Terns. [K1.3 info gap, K2.2 critical habitat, K3.1 poorly studied, K3.5 comm. volunteers].

- <https://environment.bm/s/Envirotalk-834-Winter-2019.pdf>
- http://www.audubon.bm/images/pdf/Newsletters/Vol_30_No3_2019.pdf

On August 30th the Bermuda Monetary Authority released the first coin in a series of 6 **commemorative coins depicting Bermudian flowers**. The first coin features the Bermudiana. [E5.4 symbols, E5.2 art].

- <http://bernews.com/2019/08/bma-release-special-commemorative-coins/>
- <https://www.bma.bm/coin-catalogues/bermudiana-2019>



Bermudiana coin (image: www.bernews.com)

Calm weather in the last week of August led to particularly noticeable accumulations of **coral spawn** in the water along the South Shore. Photos of the event were featured in the Royal Gazette and online. <http://www.royalgazette.com/environment/article/20190829/acres-of-coral-spawn-shocks-veteran-conservationist>



Coral spawn at Clearwater Beach (Photo: Alison Copeland)

SEPTEMBER 2019

Category 3 Hurricane Humberto passed about 75 miles west of Bermuda on the night of Wednesday September 18th. Figures from the Bermuda Weather Service indicate:

- Humberto's top sustained winds around 9pm at the airport: 83mph, gusting to 116mph
- Top winds from 7pm to 10pm: 92mph at the Maritime Operations Centre, gusts of 144mph
- Pearl Island Automated Weather Observing System in the Great Sound clocked 123mph at 9pm
- The Crescent Channel Automatic Weather Observing System picked up gusts of 130mph at 9pm
- Estimated total rain was 2 to 4 inches for the whole event
- Highest seas associated were 48ft off to Bermuda's north, 42ft in the north marine area
- Storm surge recorded at Esso Pier was a maximum of 2 to 3 feet

<https://www.gov.bm/articles/hurricane-humberto-update-bermuda-weather-service>

<https://www.gov.bm/articles/disposing-horticultural-waste>

On Wednesday September 25th **Tropical Storm Jerry** brushed over the island and dissipated as it passed.

<https://www.gov.bm/articles/post-tropical-cyclone-jerry-update-1230-pm-sept-25>

Grease balls from fats and oils disposed of via the Seabright Outfall washed up on Grape Bay and other South Shore beaches in mid-September. [K5.5 sewage, B4.12].

<http://www.royalgazette.com/environment/article/20190914/grease-balls-make-return>

On September 27th Minister Walter Roban laid before the House bills for consultation on submarine cables. The **Submarine Cables (Protected Areas) Act 2019** provided rules for establishing new protected areas and the **Submarine Cables (Protected Areas) Order 2019**, identified the cable protection zone (including a map) and laid out activities constituting an offence within that zone. While the protected area is primarily protecting infrastructure, some biodiversity protection may also result. [G2, I4.5 corridor, K6.3 infrastructure].

The Minister's complete remarks can be read here: <https://www.gov.bm/articles/submarine-cables>

The Bermuda Audubon Society held several field trips in the autumn, including participation in the **World Shorebird Day** in September. The society's annual Paget Island **Bird Camp** scheduled for October was cancelled due to damage to Paget Island from hurricane Humberto and loss of the Government boat servicing the island. [E8.2 international day event, K3.5 community spp data, E3 comm data, C3.10 field trip].

- <http://bernews.com/2019/10/audubon-society-photo-field-trip-sunday/>
- <http://bernews.com/2019/09/audubon-society-mark-shorebirds-day/>

OCTOBER 2019

A report on the population of the critically endangered **Bermuda skink** (*Plestiodon longirostris*), published on October 1st, concluded that the remaining population is still vulnerable. "Although we identified two relatively large populations, the fluctuations we observed suggest they remain vulnerable and may not be viable in the long term without management (eg. creation of artificial burrows for both seabirds and skinks, predator control and habitat restoration), especially during periods of low abundance or when population growth is slow." (Turner et al., 2019). The report recommends that monitoring and conservation efforts continue. A copy can be downloaded [here](#). [K3.1, E2.1 skink habitat clean-up, K3.2, K4.2 habitat, J1, J3]. <http://bernews.com/2019/10/major-new-report-skink-population-numbers/>



Adult (L) and Juvenile (R) Bermuda Skinks trapped during the study. (Photo: Alison Copeland)

In October, DENR Senior Marine Conservation Officer Dr. Sarah Manuel presented a lecture as part of the BZS lecture series entitled “**A Conservation Dilemma: Seagrass and Green Turtles**”. She discussed seagrass species, the communities they support, the current status of Bermuda’s seagrasses and the impact of green turtle grazing on seagrass habitat. [A2.4, K1.7].

The **Bermuda Botanical Society held a plant sale** at Windy Bank Farm on Saturday October 12th. Offerings included a selection of ornamental plants and succulent gardens, along with native and endemic trees, shrubs and ferns. [E2.4 native and endemic plants].

- <http://bernews.com/2019/09/bermuda-botanical-society-plant-sale-on-oct-12/>
- <http://bernews.com/2019/10/photos-video-botanical-society-plant-sale/>

The Department of Environment and Natural Resources **autumn Envirotalk newsletter** was released on October 4th. It contained articles on conservation of endemic land snails, animal import considerations following natural disasters, and a summary of this summer’s Greenpeace voyage to the Sargasso Sea. It is available at: <https://environment.bm/envirotalk?rq=envirotalk>. [D2.1 articles, D2.5 online content, E8.1 dates, D7, J2 species, K5 plastic, J3 ex situ].

Several press articles resulted from the release of the Envirotalk newsletter:

- <http://www.royalgazette.com/news/article/20191011/bermuda-land-snail-thriving-on-nonsuch-island>
- <http://bernews.com/2019/10/bermuda-snail-came-back-dead/>
- <http://bernews.com/2019/10/bermuda-researcher-describes-sargasso-sea-trip/>

A short column on the Cahow Recovery Project was featured in the October edition of American Airlines in-flight magazine ‘American Way’. [D4.5 in-flight magazine].

In October, a website honouring the late ocean explorer Teddy Tucker was launched at www.teddytucker.com. The site contains historical underwater photos and observations. [K3.5 comm data].

In the October edition of the BEST lunch and learn lecture series at the Bermuda College, Chris Faria gave the audience a presentation on **bio-intensive, organic agriculture** and backyard farming. [E2.2 backyard conservation, E5.6 gardening seminar, E5.7 techniques, A2.4 lecture].

- <http://www.royalgazette.com/environment/article/20191113/grow-your-own-and-save-planet>
- <http://www.royalgazette.com/environment/article/20191025/eco-lunch-and-learn-series>
- <http://bernews.com/2019/10/eco-lunch-learn-tackles-environmental-issues/>

In October the results of the XL Catlin Deep Ocean Survey, which took place off Bermuda in 2016, were highlighted online. The results include 9 research papers and the identification of a hundred new species. [E3.9].

- <http://bernews.com/2019/10/video-researchers-dive-islands-depths/>
- <https://gue.com/blog/new-ocean-zone/>
- <http://bernews.com/2019/10/axa-xl-launch-ocean-protection-education/>

On October 30th 150 delegates attended the first **Bermuda Climate Risk Forum**, presented by the Bermuda Tourism Authority, BIOS and the PGA tour. Presenters, including keynote speaker Michael

Bloomberg and Premier David Burt, discussed reducing carbon emissions, climate change, infrastructure, sea level rise and the global insurance and reinsurance industry. [E10.4, E10.5, K6.3, A3.4, A3.2, A2.5, A2.4, K5 impacts, K6.2 climate change, B4].

- <http://bernews.com/2019/10/photos-first-bermuda-climate-risk-forum/>
- <http://bernews.com/2019/10/bermuda-climate-risk-forum-wednesday/>

NOVEMBER 2019

Boat trips to watch **returning Cahows** at sea operated over several weekends in November by the Bermuda Audubon Society in collaboration with the Bermuda Zoological Society [C3.10 field trip].

- <http://www.royalgazette.com/news/article/20191112/watch-cahow-mating-ritual-at-sea>
- <http://www.royalgazette.com/environment/article/20191023/cahow-continues-comeback-from-near-extinction>
- <http://bernews.com/2019/11/offshore-boat-trips-to-view-bermuda-cahows/>

On November 28th Dr. Dörte Horsfield presented a lecture at the Bermuda College entitled '**Island biodiversity and the movement of species**', as part of BEST's eco lunch and learn series. The talk highlighted some of Bermuda's endemic species, as well as invasive species, and discussed how both had arrived on the island. [A2.4 lecture, C3 biodiversity literacy]. <http://bernews.com/2019/11/dr-horsfield-to-speak-at-eco-lunch-learn/>

In November Vector Control reminded businesses that have dumpsters or storage for food waste that they needed to clean and empty them regularly **to avoid attracting rats**. [D4]. <http://www.royalgazette.com/health/article/20191112/vector-control-to-monitor-stores-rat-problem>

On November 9th, choy Aming, the senior aquarist at the Bermuda Aquarium, Museum and Zoo, and director of the Bermuda Shark Project, participated in the **Sea Stories 2019** event at the Explorers Club in New York City. As one of five speakers, he gave a presentation entitled '**Secrets of the Tiger Shark Highway**'. [A2.4 lecture, K1.7 researchers].

- <http://bernews.com/2019/10/aming-discuss-tiger-shark-research-nyc/>
<https://www.eventbrite.com/e/explorers-club-sea-stories-2019-tickets-73425753405>

On November 12th the **Department of Planning** announced a new series of **free clinics** where the public can learn about Planning applications and processes. [D3.8 landowner meetings, F3.1 advice to landowners]. <https://www.gov.bm/articles/department-planning-announces-second-series-free-planning-clinics>

On November 12th Government advised the public that a small aircraft would be flying at around 300m over the island in November as water depth and land elevation data are being captured to **update Bermuda's aerial imagery and nautical charts**. The project is a partnership between the Bermuda Government and the UK Hydrographic Office (UKHO) Overseas Territories Seabed Mapping Programme. [I1.7 aerial photo survey, H4 detecting infractions, A3.4, K1.9 habitat maps].

- <https://www.gov.bm/articles/airborne-hydrographic-survey-bermuda-project>
- <http://www.royalgazette.com/news/article/20191112/survey-aircraft-to-scan-island>
- <http://bernews.com/2020/01/minister-desilva-meets-ukho-surveyors/>

The **Farmer's market** at the Botanical Gardens began their winter 2019/20 season on November 16th with vendors selling locally made products and fresh produce. [E5.5].

<http://www.royalgazette.com/news/article/20191114/farmers-market-returns>

On November 21st Choy Aming of the Bermuda Shark project gave a **public lecture at BAMZ on Bermuda's Sharks**, with proceeds going to support students traveling to Borneo for a biodiversity expedition. [A2.4 lecture, K1.7 researchers].

In mid-November the Bermuda National Trust, Bermuda Audubon Society and Mid-Ocean Club **objected to a DAB ruling that would allow slate quarrying** at the site of a proposed residential development on Judkin Lane in Hamilton Parish. The appeal also resulted in several letters to the Editor appearing in the Royal Gazette. [D2.2 newspaper, I4.4 planning appeal, I4.6, K6.4 dev't].

- <http://www.royalgazette.com/environment/article/20191129/government-accused-of-pushing-quarry-plan>
- <http://www.royalgazette.com/news/article/20191114/bnt-fights-quarry-operation>
- <http://www.royalgazette.com/letters-to-the-editor/article/20191129/protecting-our-conservation-zones>
- <http://www.royalgazette.com/opinion/article/20191202/we-must-protect-our-woodland-reserves>
- <http://www.royalgazette.com/environment/article/20191228/wingate-slams-quarry-plan>

There was **no Throne Speech** this year, instead the Premier acknowledge accomplishments from past years in the House. There were no environmental items.

<https://www.gov.bm/articles/throne-speech-2018-and-beyond-charting-path-future-while-challenging-status-quo-build>

DECEMBER 2019

In December Bermudian photographer Meredith Andrews created an eye-catching **advent calendar** on Instagram, which for the second year in a row, comprised **photos of marine plastic** collected from Bermuda's beaches. This year's calendar included a '5' made from pens and pen caps, a '2' made from plastic balls and a '1' outlined in cigarette lighters. [D2.7, E5.2 art]. <http://bernews.com/2019/12/ocean-plastic-advent-calendar-raises-awareness/>

In early December the Department of Planning stated in a press release that as part of the **streamlining** of the **planning process**, all planning and subdivision application notices are advertised in the online Official Gazette at <https://www.gov.bm/official-gazette> . The public are able to access present notices, as well as an archive of past advertisements.

- <https://www.gov.bm/articles/planning-application-notices-available-online-monday-through-friday>
- <http://www.royalgazette.com/environment/article/20191211/planning-applications-online>
- <http://www.royalgazette.com/environment/article/20191216/concerns-over-planning-rule-change>

On December 9th PartnerRe hosted a showcase evening at the BUEI to celebrate the participation of students from 8 secondary schools in the **Dollars for Hours programme**. This year's environmental projects include the Bermuda Institute partnering with the Bermuda Audubon Society to build bluebird nest boxes, and CedarBridge Academy partnering with the National Trust on a project at the Gladys Morrell Nature Reserve. [E2.8 bluebird box, F3.3 sponsor, E7.3 youth involvement].

<http://bernews.com/2019/12/video-partnerre-dollars-hours-showcase/>



Presentation Display at Dollars for Hours Showcase (Photo: Bernews.com)

On the weekend of December 14th and 15th the Ministry of Public Works partnered with KBB to promote a **2-day community clean-up of horticultural waste**. The Government has waived dumping fees at the Marsh Folly facility for the two days, and the Sunday permits for truckers are also being waived for Dec. 15th. [F1 incentives, F2 economic, A3.4 collaboration].

- <https://www.gov.bm/articles/2-day-horticultural-community-cleanup>
- <http://www.royalgazette.com/news/article/20191228/public-pitch-in-for-island-clean-up>
- <http://bernews.com/2019/12/successful-horticultural-community-cleanup/>

The winter edition of the **DENR newsletter Envirotalk** was published on December 18th. It contained an updated from the Bermuda Audubon Society on their work with **Common and Roseate Terns**, and information for visitors and tourism businesses on why **taking seashells**, sand and other beach items is harmful to the environment and may be illegal [D2.1 articles, D2.5 online content, E8.1 dates, D7, J2.4 tern project, K1.3 informed mgt, K1.7 researcher communication, D6 info to visitors, E10, D6.1 tourists, F1 fines]. <https://environment.bm/s/Envirotalk-834-Winter-2019.pdf>

The DENR undertook work in December to **clear invasive plants** from around the protected Yellowwood trees on **Paynter's Hill**. Pothos vine was also removed from the cave within the government nature reserve. [E1.3 habitat restoration, E1.4 culling, I3 PA mgt, B, J1, K3.4].

The Bermuda Audubon Society began work at their Somerset Long Bay Nature Reserve in mid-December to **remove invasive vines** that had been smothering the mangroves and covering the fences at the

reserve. Further restoration is planned in the New Year. [E1.3 habitat restoration, E1.4 culling, I3 PA mgt]. http://www.audubon.bm/images/pdf/Newsletters/Vol_31_No1_2020.pdf



Somerset Long Bay reserve before clearing (Alison Copeland)

A new environmental group, the **Bermuda Climate Action Network (Bermuda CAN)** emerged in early December. Their first initiative will be to facilitate the planting of 2,020 trees in Bermuda in 2020 in a project called Vision 2020. [..].

- <http://bernews.com/2019/12/vision-2020-bermuda-climate-action-network/>
- <http://www.royalgazette.com/environment/article/20191212/group-will-tackle-climate-change>

New Scientific Papers at BAMZ library this year

(Thanks to Alison Green, the [BAMZ librarian](#) who formatted and shared most of this information).

Avila, S. P. et al., **Towards a ‘Sea-Level Sensitive’ dynamic model: impact of island ontogeny and glacio-eustasy on global patters of marine island biogeography**, *Biological Reviews*, 2018. (BAMZ #3265)

Ballou, T. C., S. C. Hess, R. E. Dodge, A. H. Knap & T. D. Sleeter, **Effects of Untreated and Chemically Dispersed Oil on Tropical Marine Communities: A Long-Term Field Experiment**, *International Oil Spill Conference Proceedings*, 1989(1): 447-454, 1989. . (BAMZ #3308)

Bijak, A L., K.j. van Dijk & M. Waycott, **Population structure and gene flow of the tropical seagrass, *Syringodium filiforme*, in the Florida Keys and subtropical Atlantic region**, *PLOS One*, 13(9): e0203644, 2018. (BAMZ #3351)

Borden, W. C., T. C. Grande & M. V. H. Wilson, **Phylogenetic relationships within the primitive acanthomorph fish genus *Polymixia*, with changes to species composition and geographic distributions**, *PLOS One*, 30 pp., 2019. (BAMZ #3305)

Conte, M. H., **The elemental composition of the deep particle flux in the Sargasso Sea**, *Chemical Geology*, 511: 279-313, 2019. (BAMZ #3367)

Copeland, A., [Bermuda Biodiversity Action Plan Activity Report 2018](#), Department of Environment and Natural Resources, Government of Bermuda, 2019. (REF BDA GOVT. REPORTS / BAMZ #3363)

Copeland, A., [Determining the habitat preferences of the Bermuda Land Snail \(*Poecilozonites bermudensis*\) on Port’s Island, Bermuda](#), Field Project for: Postgraduate Certificate in Ecological Survey Techniques, University of Oxford, 48 pp, 2018. (BAMZ #3302/REF BDA GOVT REPORTS)

Copeland, A. [Re-introduction of Governor Laffan’s Fern \(*Diplazium laffanianum*\) into the wild. Report on plantings for calendar year 2019](#). Bermuda Department of Environment and Natural Resources. BBP#281. (BAMZ#3378/ REF Bda GOVT REPORTS)

Cortes, J. et al., **The CARICOMP Network of Caribbean Marine Laboratories (1985-2007): History, Key Findings, and Lessons Learned**, *Frontiers in Marine Science*, 5: 18 pp., 2019. (BAMZ #3266)

Eddy, C. et al., **The life history characteristics of invasive lionfish (*Pterois volitans* and *P. miles*) in Bermuda**, *Environmental Biology of Fishes*, 14 pp., 2019. (BAMZ #3299)

Fourqurean, J. W. et al., **Decadal Monitoring in Bermuda Shows a Widespread Loss of Seagrasses Attributable to Overgrazing by the Green Sea Turtle *Chelonia mydas***, *Estuaries and Coasts*, 42: 1524-1540, 2019. (BAMZ #3340)

Garcia, G., M.E. Outerbridge and K. Ovaska. [Back from the brink – recovery efforts for endemic land sanils of Bermuda](#). Tentacle No. 27 – February 2019.

Goodbody-Gringley, G., E. Strand & J. M. Pitt, [Molecular characterization of nearshore baitfish populations in Bermuda to inform management](#), PeerJ, 7: e7244(18 pp.), 2019. (BAMZ #3339)

Goodbody-Gringley, G. et al., **Assessment and Management of Invasive Lionfish Populations in Bermuda**, Proceedings of the 71st Gulf and Caribbean Fisheries Institute, November 5-9, 2018. (BAMZ #3373)

Goodbody-Gringley, G., T. Noyes & S. R. Smith, **Bermuda**, In: Y. Loya et al. (eds.), Mesophotic Coral Ecosystems, Coral Reefs of the World 12, 2019.

Hearty, P. J. & S. L. Olson, **Environmental Stress and Iterative Paedomorphism in Shells of *Poecilozonites* (Gastropoda: Gastrodontidae) from Bermuda**, Palaios, 34: 32-42, 2019. (BAMZ #3272/BBP #272)

Kemp, A. C. et al., **Testing the Utility of Geochemical Proxies to Reconstruct Holocene Coastal Environments and Relative Sea Level: A Case Study from Hungry Bay, Bermuda**, Open Quaternary, 5(1):1-17, 2019. (BAMZ #3362/BBP #273)

Madeiras, J., [Cahow Recovery Program for Bermuda's Endangered National Bird 2017-2018 Breeding Season Report](#), Department of Environment and Natural Resources, Government of Bermuda, 30 pp., 2019. (BAMZ #3285)

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