Envirotalk

SPRING 2020
VOLUME 84 No. 1

GOVERNMENT OF BERMUDA
Department of Environment and Natural Resources

TO PROTECT BERMUDA'S ENVIRONMENT AND RESPONSIBLY MANAGE ITS NATURAL RESOURCES

WELCOME

to our spring edition of Envirotalk..

In this issue –

- Agricultural Officer Tommy Sinclair tells us why there are presently **no local bananas.**
- Read about how the **Governor Laffan's Fern recovery project** did in 2019.
- Get an update on the ongoing **lionfish removal efforts**, and see the results of the winter tournament.
- Learn about **marine spatial planning** in Bermuda's EEZ and how you can participate.
- Also see:
  - Our **News & Notices** for reminders and upcoming events.
  - The **Environmental Calendar** to see what events are happening at this autumn.
  - The **Planting Calendar** to get a head start on what to plant this autumn.

Please contact the Envirotalk mailing list: envirotalk@gov.bm to be placed on the mailing list or for suggestions for future articles.

YES, WE HAVE NO BANANAS

'Yes, We Have No Bananas' is a novelty song from the 1920s that has the kind of silly lyrics that annoyingly stick in your mind after hearing it (Google it at your own risk!) Hard to believe the song actually spent 5 weeks as the Number One song in 1923.

Unfortunately, that particular phrase is something that I find myself having to repeat over and over again when asked if we have any local bananas available. In fact, the way it's looking, I may be singing the same tune for at least another year.

It was only last September (2019) when Hurricane Humberto struck the island as a Category 3 hurricane, leaving a trail of destruction in its path. Evidence of Humberto's visit exists today as a drive around the island still reveals a few roofs with tarps, a scattering of boats up on the rocks and vistas that didn't exist before the storm.

Like many other businesses, Bermuda's agricultural sector was hard hit. The salt laden winds of Humberto decimated most crops in the fields as well as seed beds being prepared for the next planting. Many fields were made inaccessible. Farmers had to cut their way in to fields and remove the fallen trees and scattered debris. Fields had to be cleaned and re-ploughed while new seeds had to be purchased and sown. Most farmers found themselves starting all over again and at least 6-8 weeks behind schedule. Though there were fresh local vegetables for Christmas, the variety and quantity were certainly limited. I am happy to report that this has improved tremendously and that at the time of writing there is a wide variety and abundance of local produce available.

I wish the same could be said of the local banana crop. Virtually all banana patches suffered heavy to severe damage. Even the small patch in my backyard looked as if Humberto tried to French braid my trees, as nothing was left but a tangled mess. For a short period following the hurricane, farmers were able to salvage the odd bunch of bananas from downed trees and bring them to the Agriculture Service Centre for ripening. After a few weeks there were no more bananas to be found. Typically at this time of year we would ripen approximately 120 cases of bananas per week. Unfortunately, we haven't ripened any bananas for the past couple of months. When is the last time you ate a local banana? Though some farmers are now finding the odd bunch here and there, it is estimated that it will take approximately 18-24 months to reach the level of banana production that was enjoyed prior to Humberto. This is not only due to hurricane damage but also to the amount of time it takes for a banana plant to grow and produce a bunch of bananas.

Since the hurricane, a number of growers have also reported a somewhat unusual, although not uncommon, disorder in some of their banana plants. It's called

Choke. Certain stress factors such as cold winter temperatures, erratic soil, moisture levels and severe disturbance of the roots may result in the plant not having the energy to push the bunch of bananas out the top of the plant. What can result is an abnormal swelling or pronounced bulge in the trunk of the plant, making it appear as 'pregnant.' Sometimes the bunch will poke out the side of the plant (the movie Alien comes to mind) or push straight up in the air at the top of the plant with the bananas hanging upside down. Banana plants with Choke normally don't produce great bunches of bananas and it would likely be better to cut them down and let the suckers grow in its place.

Bermudians love their local bananas. Codfish breakfast without local bananas just isn't the same. Nor is a peanut butter and banana sandwich or a homemade loaf of banana bread. The waiting game for a good banana harvest has started.

We all had to wait after Hurricane Emily, Fabian, Nicole, Gonzalo, Fay and others, now we'll have to wait again. Until then, 'yes, we have no bananas today!'

Tommy Sinclair
Agricultural Officer

A STATUS UPDATE ON GOVERNOR LAFFAN'S FERN

The International Union for the Conservation of Nature (IUCN) considers a species to be 'extinct in the wild' when no known naturally occurring specimens remain in the species' original habitat. One species that has been given this designation is Bermuda's own Governor Laffan's Fern (Diplazium laffanianum). This endemic fern was discovered in the Walsingham area in the 1880s, and was last seen growing wild in 1905. Despite numerous searches for over 100 years, no wild specimens have been found and it survives only as a potted plant.

Multiplying the few remaining potted ferns, to have sufficient numbers to begin returning some to the wild, has been one of the aims of the Governor Laffan's Fern Recovery Project since 2003. Thanks to our project partners at Omaha's Henry Doorly Zoo, we now have many immature ferns and have conducted out-planting trials since 2014. Last year was our biggest planting effort yet. Between January and March 2019, 27 immature Governor Laffan's Ferns were planted at 3 sites; the Bermuda Audubon Society's nature reserve at Sear's Cave and two caves in the Walsingham Trust's property (aka Tom Moore's Jungle).

Survivorship was highest at Sear's Cave, with 11 of the 12 ferns planted there currently surviving. The ferns planted at Walsingham did not fare well

Gov. Laffan's Fern planted at Sear's Cave in 2019.

during last September's Hurricane Humberto. None of the ferns planted at one of the caves survived, while only 4 survived at the second cave. Humberto delivered salt spray to the island for several days, and only 2-4 inches of rain fell during the storm, resulting in salt damage to vegetation island-wide. The combination of salt on their fronds, and burial by dead Fiddlewood and Suriname Cherry leaves following the storm, are probably what killed the ferns.

At present there are 16 immature Governor Laffan's Ferns surviving in the wild in Bermuda, including 15 from 2019 and 1 that was planted in 2015. More plantings are planned in 2020. This species will continue to be considered 'extinct in the wild' until the wild ferns mature and produce offspring that survive. Only after a few generations will its future truly look secure. So let's all cross our fingers for no hurricanes this year!

Alison Copeland,
Biodiversity Officer

A THREE-PRONGED APPROACH TO LIONFISH CONTROL

Back in 2000, Bermuda was the first place outside of U.S. waters to detect invasive lionfish, and these mid-sized predators from the Indo-Pacific have since spread throughout the Caribbean and Gulf of Mexico. Studies have shown that lionfish eat anything and everything, and have the potential to impact fish and invertebrate populations in invaded reef ecosystems where they are not recognized as predators. The Bermuda Lionfish Culling Program officially began in 2008 with the goal of minimising these impacts by training and licensing cullers to remove lionfish from our reefs. However, as lionfish sightings became more common and their presence on deep reefs below 30 metres (100 feet) was discovered by the technical diving community in 2009, it became clear that more needed to be done. In 2012, a workshop was convened to develop a formal control plan and the Bermuda Lionfish Task Force (BLTF) was created to help co-ordinate the variety of stakeholders involved in the three aspects of lionfish control: research, education and

Photo: Stuart Joblin

Figure 1. Lionfish at a 'hotspot' down at 60 m / 200 ft. (Photo: Alex Chequer)

Figure 2. Dr Gretchen Goodbody-Gringley of BIOS conducts a prey fish survey. (Photo: Alex Chequer)

removal efforts.

A research team from the Bermuda Aquarium Museum and Zoo (BAMZ), the Bermuda Institute of Ocean Sciences (BIOS), the Department of Environmental Protection (now DENR – the Department of Environment and Natural Resources) and the University of Massachusetts Dartmouth began studying the local lionfish population in 2013, with the support of a Darwin Plus grant (the very first one!) awarded by the Department for Environment, Food & Rural Affairs (DEFRA) in the UK and hosted by the Bermuda Zoological Society (BZS). At that time, lionfish were uncommon on shallow reefs, but a few 'hot spots' down at 60 metres (200 feet) had lots of them (Figure 1). The dive team also surveyed the small fishes (both small-bodied adults and juveniles of larger species) that might constitute prey items for lionfish (Figure 2). The main thing that stood out from the data was that, at a given depth, more lionfish were found at sites where there were more potential prey fishes available.

Last summer the BLTF, Atlantic Conservation Partnership and BZS supported follow-up surveys by BIOS and BAMZ researchers at many of the same places surveyed previously. This study found that lionfish are still not commonly seen during daytime surveys on shallow reefs, but are now more abundant across a wider range of deep reef areas, particularly on the northern reefs at depths of 30 metres and 60 metres. However, it is important to remember that lionfish are most active at dawn and dusk, so daytime surveys on complex, shallow reefs are unlikely to detect them. On a more positive note, the surveys of potential prey fishes on both deep and shallow reefs indicate that invasive lionfish have not had a noticeable impact on the relative abundance of small and juvenile fishes – at least so far.

When the Nekton Mission submersibles investigated Bermuda's deep slope areas in 2016, lionfish were observed down to depths of 350 metres (1,000 feet). The range of depths where lionfish occur means that a variety of approaches are

needed to help control them. Lionfish are caught as bycatch in commercial lobster traps, and special lionfish traps and even a remotely operated underwater robot – Atlantic Lionshare's Reef Sweeper - have also been used to remove them from our reefs.

However, the volunteer culling program administered by DENR is the mainstay of removal efforts, and was responsible for removing more than 2,300 lionfish during 2019. Cullers capture lionfish while freediving or SCUBA diving, and some even do both. Starting with the Groundswell tournament in 2012, the BLTF has worked with various partners to organize tournaments to engage cullers and educate the public, and a committee was recently formed to focus on this. Different tournaments reflect the different types of cullers: casual cullers hit a wide range of areas, usually in the warmer months of the year, but a small number of avid cullers are responsible for the majority of the culling.

This was clear when the results of the 6th Annual Winter Lionfish Derby were tallied, with a total of 1,072 lionfish captured during January this year. The top SCUBA team (Figure 3) captured 250 lionfish between them, while the top freediving team captured 242 lionfish. The prize for the most culls during the tournament went to freediver Chris Cabral, who personally captured 133 lionfish (Figure 4). In addition, the Lionfish King and Queen awards went to the male and female culler who reported the most culls over the past year: Kweshon Hollis and Robyn Vincent, both instructors from Dive Bermuda. Lionfish tournaments would not be possible without the generous donations of many sponsors, and we are grateful for their support (Figure 5). The next lionfish tournament, the Spring Splash, will run from March 20th through 28th.

The reporting of lionfish culls is an important aspect of the culling program, because it helps DENR track the status of Bermuda's invasive lionfish population, and the BLTF recently funded an upgrade to the online reporting system. Since catch reporting started in 2013, the number of lionfish culled annually has increased from year to year, although this is affected by the amount of culling effort taking place. Importantly, the number of culls from the 2020 winter derby represent a 26% increase over the 849 fish caught during the same month last year, and 72% more than the 624 fish caught in January of 2018, despite similar numbers of active participants from year to year. This tournament is

Figure 3. Winners of the 6th Winter Lionfish Derby, including the 2019-20 Lionfish King and Queen. (Courtesy of RYZE photography)

Figure 4. Chris Cabral, who captured the most lionfish during the derby, with BLTF co-chair Paul van Pelt. (Courtesy of RYZE photography)

Figure 5. Sponsors of the 6th Winter Lionfish Derby, taken from the tournament hoodie.

therefore a useful way to track changes in the local lionfish population. As with last summer's surveys, continuing increases in lionfish catches support the conclusion that Bermuda's invasive lionfish population is still expanding.

DENR has established a vendor program that allows some of the most active lionfish cullers to sell their catch to restaurants and grocery stores. This serves to both motivate and reward this group, and also increases the supply of lionfish to the market. A recent outreach event held in partnership with the Bermuda Tourism Authority saw celebrity chef Eric Adjepong prepare lionfish hors d'oeuvres for a delighted crowd in the BAMZ hall. The public appetite for lionfish is definitely there!

So, the take home message is that Bermuda must be committed to lionfish control for the long haul and we need as many people as possible to contribute to this effort in whatever way they can, be it culling or consuming. For more information on lionfish in Bermuda, go to www.lionfish.bm. If you are interested in becoming a lionfish culler, please visit the Bermuda Lionfish Culling Program Facebook page: www.facebook.com/BermudaLionfishCullingProgram/.

Joanna Pitt, Marine Resources Officer and Robbie Smith, Natural History Museum Curator

BERMUDA OCEAN PROSPERITY PROGRAMME

On June 5th, 2019, the Bermuda Ocean Prosperity Programme was launched. The Government of Bermuda renewed its commitment to support the sustainable growth of marine activities and use of resources in Bermuda's exclusive economic zone (EEZ) and at the same time, committed to fully protecting at least 20% of Bermuda's waters by 2022.**What is the Bermuda Ocean Prosperity Programme?**

This programme is a collaboration between the Government of Bermuda, Blue Prosperity Coalition (on behalf of the Waitt Institute), and Bermuda Institute of Ocean Sciences (BIOS).

The Bermuda Ocean Prosperity Programme is about economic growth, social inclusion and improved livelihoods while at the same time ensuring environmental sustainability of our EEZ.

The goals of the programme include:

1. a healthy and productive ocean;
2. marine spatial planning for long-term sustainable management, economic growth and conservation of ocean resources;
3. a full-scale economic development plan with scientifically sound conservation goals;
4. sustainable fisheries policies and programmes that create positive incentives to ensure responsible fishing;
5. assessing and operationalizing Bermuda's *Department of Environment and Natural Resources'* 2018 *"Fishery Data Improvement and Assessment Action Plan"*;
6. durable government, financial and human capacity to carry out the above; and
7. durable civil society, financial and human capacity to rebuild fisheries where needed and grow a sustainable *Blue Economy* through a myriad of industries.

The Programme will include assessments of current marine industries, such as tourism, maritime transportation, and commercial and recreational fisheries to best understand their status and how to address the needs of all marine users. Then, through the marine spatial planning process guidelines for all ocean use will be developed to optimize sustainable economic growth across all marine sectors while also setting aside 20% of our EEZ as fully protected marine protected areas.

Photo: Thad Murdoch

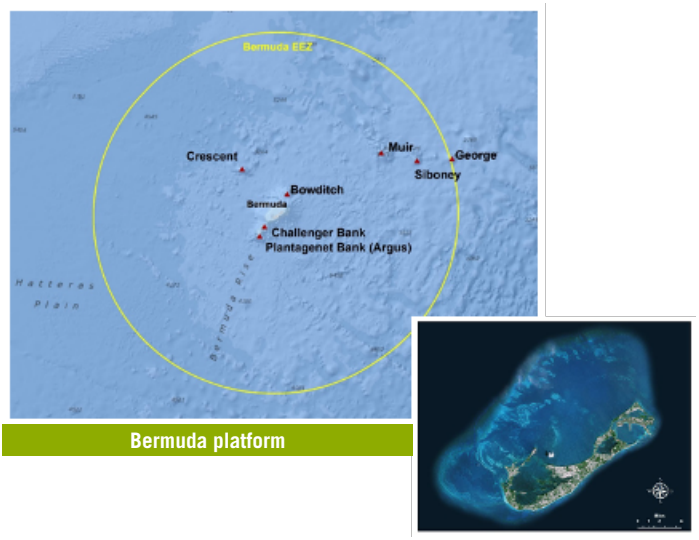
The most important aspect of the Bermuda Ocean Prosperity Programme is that it is led by the Government of Bermuda and will include comprehensive consultations with the public throughout the process.

Key terms relating to the Bermuda Ocean Prosperity Programme

Bermuda's Exclusive Economic Zone (EEZ) – what is it?

Bermuda's EEZ, approximately 464,993 sq. km of the Atlantic Ocean, is the area that extends approximately 370 km (200 nautical miles) from our coastline. It encompasses the Bermuda Platform and surrounding deep ocean, including 6 other seamounts: Challenger and Plantagenet (also called Argus) Banks, and Bowditch, Crescent, Muir and Siboney Seamounts. The Bermuda Platform is the largest and the highest feature.

Interesting fact: The Bermuda Platform, where most of our activities occur, is approx. 623 sq. km - 0.13% of our EEZ.



Bermuda platform

What is marine spatial planning (MSP)?

Marine spatial planning is a way to organize marine space and manage the interactions between its different uses and users. It aims to balance development, social and economic uses, with the need to protect the marine environment.

Why is marine spatial planning important?

The marine environment is important to everyone living in Bermuda, in one way or another. It is important to the economics of the island. It also contributes to our quality of life as we use it for recreation, inspiration and aesthetic enjoyment.

It helps to attract international business, and others depend on it more directly to make their living through tourism, fishing, shipping, etc. It is important that we use this resource wisely. The development of a marine spatial plan will help us to balance our current activities, allow for new and emerging uses, such as renewable energy and mariculture, while protecting the marine ecosystem that makes it all possible.

In our EEZ we have over-exploited some resources, particularly those close to shore, and underexploited some resources. We have competing interests, for example motorized vessels vs non-motorized vessels and other passive recreation. We have no integrated decision-making process for development in the marine environment. A marine spatial plan will help with all of these issues. It will also help to attract new businesses, which will mean more jobs.

Blue Economy

The Blue economy is all the economic activities related to the sea, e.g. fisheries, tourism, shipping, offshore wind energy, ocean energy, mariculture, desalinization, biotechnology, etc. However, in order for the marine environment to continue to be able to sustain these marine-based economic activities, it is essential that they be carried out with conservation and ocean health in mind.

Bermuda Ocean Prosperity Programme – next steps

- SeaSketch surveys to gather information on ocean uses

  SeaSketch is a user-friendly interactive mapping tool which allows stakeholders to map the areas of ocean that they use, thus providing valuable information for the marine spatial planning process.

  Let the BOPP team know how you use the marine environment by completing the SeaSketch survey, to be launched on 25 March 2020, online https://www.seasketch.org/#projecthomepage/520d37a7674659cb7b33c1ba/forum, or you can set up an appointment with one of the BOPP team (wwade@waittinstitute.org) who can help you. There will also be students at some at public venues conducting surveys.

- Focused working groups to provide input to BOPP's activities, with specific input to the marine spatial plan

  Focused working groups will be created based on ocean-use themes including commercial fishers; recreational fishers; diving, snorkelling, and swimming; aquaculture; tourism, boating, and sports (jet skis, powerboats, and water taxis); utilities, infrastructure, and development; passive recreation and conservation.

  Membership for each stakeholder working group will be comprised of representatives from relevant associations or other interested groups, but members of the public can volunteer to participate on a working group. However, for purposes of manageability numbers will be limited.

- Public Launch

  The public launch event planned for March 25th 2020 has been cancelled due to the COVID-19 pandemic. The public will be advised when it is rescheduled and are encouraged to attend.

This information will all be used to develop the first draft of the marine spatial plan for Bermuda's EEZ by the end of November 2020. This draft will then go out for public consultation. The BOPP team want to make sure all stakeholders have a voice and participate in planning the future of our EEZ. The success of this project depends on you.

BOPP website BOPP Facebook

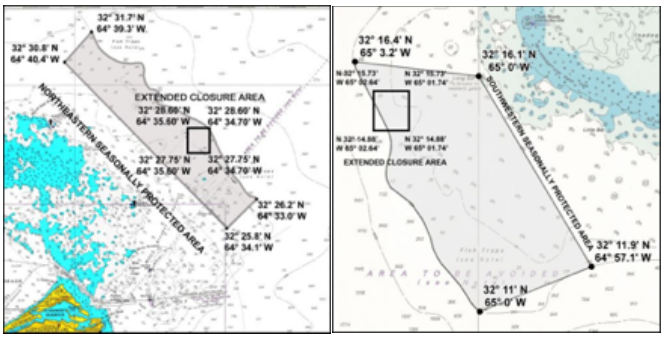
NEWS & NOTICES

LOBSTER DIVING STATISTICS REMINDER

Recreational lobster divers are reminded that their catch statistics for the 2019-20 season must be submitted online (using the portal at www.fisheries.gov.bm) by April 30th. There should be an entry for each date / location that you fished, and a "No fishing" entry for any month in which you did not fish. Anyone failing to submit catch statistics for the season will not be issued a recreational lobster diver licence for the upcoming 2020-21 lobster season. Please call 293-5600 or email fisheries@gov.bm if you are having difficulties accessing the portal.

SEASONAL FISHING CLOSURES TO PROTECT SPAWNING FISHES

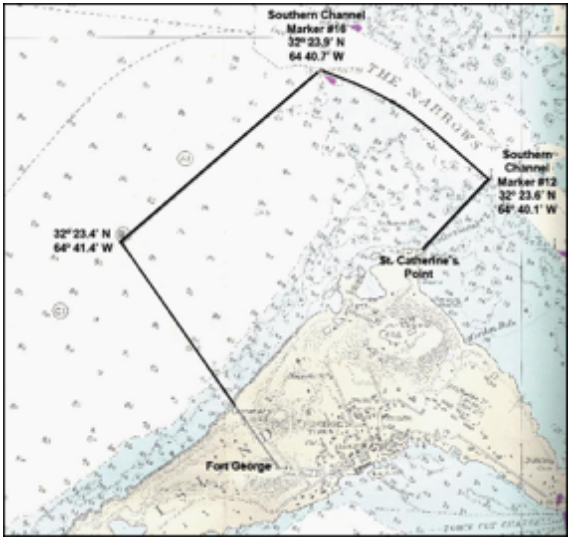
Please remember that fishing is prohibited in the northeastern and southwestern Seasonally Protected Areas (the 'Hind Grounds') from April 15th through August 14th. Within each of these areas there is an extended closure box that aims to protect Black groupers, and these two areas are closed to fishing through the end of November.



The Hind Grounds Maps

Fishing is also prohibited in the Blue Striped Grunt Aggregation Area, off Fort St. Catherine, for the months of **May and June.**

Blue striped grunt aggregation closure area map



ENVIRONMENTAL CALENDAR SPRING 2020

MARCH 2020

The **Spring Splash Lionfish Tournament** will run from March 20th through 28th

Saturday, March 21st: **World Forestry Day**.
World Forestry Day promotes awareness of the value of forests across the globe by providing information on the protection, production and recreation of forests. The theme for 2020 is 'forests and biodiversity'.
https://www.un.org/en/events/forestsday/background.shtml

Sunday, March 22nd: **World Water Day**.
The UN General Assembly declared March 22nd World Day for Water to promote awareness of rapidly depleting water sources and the links between clean water, social well-being and economic productivity. The theme for 2020 highlights the links between water and climate change. https://www.worldwaterday.org/

Saturday, March 28th: **Earth Hour**. Turn your lights off for 1 hour beginning at 8:30pm. https://www.earthhour.org

APRIL 2020

Wednesday, April 22nd: **Earth Day**.
April 22nd 2020 marks the 50th anniversary of Earth Day. This year's celebration is focusing on climate change. More information and videos can be found at: https://www.earthday.org/earth-day-2020/.

MAY 2020

Friday, May 22nd: **International Day for Biodiversity**.
In 2020 the celebration of biodiversity will be expanded into a week from May 18th to 22nd. The theme is "Our Solutions are in Nature", highlighting that biodiversity is the answer to many challenges that face us today, including food security, water security, sustainable livelihoods and climate change.
https://www.cbd.int/idb/2020

JUNE 2020

Friday, June 5th: **World Environment Day.**
World Environment Day is the UN's major celebration day to motivate environmental action and awareness. The theme for 2020 is biodiversity. More about the 2020 celebration here.
http://worldenvironmentday.global/

PLANTING CALENDAR – WHAT TO PLANT IN THE SPRING...

VEGETABLES

March: Beans, Beets, Broccoli, Cabbage, Carrots, Cassava, Cauliflower, Chard, Christophine, Collards, Corn, Cucumber, Eggplant, Kale, Leeks, Lettuce, Muskmelon (Cantaloupe), Mustard Greens, Okra, Pepper, Potatoes, Pumpkin, Radish, Rutabaga, Squash, Sweet Potato, Spinach, Tomato, Turnip, Watermelon.

April: Beans, Beets, Broccoli, Cabbage, Carrots, Cauliflower, Chard, Christophine, Collards, Corn, Cucumber, Eggplant, Kale, Muskmelon (Cantaloupe), Okra, Pepper, Pumpkin, Radish, Rutabaga, Spinach, Squash, Sweet Potato, Tomato, Turnip, Watermelon.

May: Beans, Cucumber, Okra, Pumpkin, Radish, Squash, Sweet Potato, Tomato.

June: Beans, Cucumber, Squash, Tomato.

FLOWERS

March/April: Acrolinium, ageratum, alyssum, antirrhinum, aster, aubrietia, baby blue eyes, bachelor's buttons, bird's eyes, blanket flower, begonia, bells of Ireland, calendula, candytuft, carnation, centaurea, chrysanthemum, cineraria, coreopsis, dahlia, African daisy, dianthus, forget-me-not, geranium, gerbera, globe amaranth, globe gilia, godeita, gypsophila, hollyhock, impatiens, larkspur, lathyrus, marigold (African), marigold (French), nasturtium, nicotiana, pansy, petunia, phlox, phlox (annual), red tassel flower, rose everlasting, rudbeckia, salipiglossis, salvia, scabiosa, statice, snow-on-the-mountain, spider flower (cleome), star-of-the-veldt, stock, sweet pea, sweet William, verbena and viola.

May: Amaranthus, balsam, calendula, celosia, coreopsis, cosmos, gaillardia, gazania, globe amaranth, hollyhock, marigold, portulaca, rudbeckia, vinca and zinnia.

June: Amaranthus, balsam, calendula, celosia, coreopsis, cosmos, gaillardia, gazania, globe amaranth, hollyhock, marigold, portulaca, rudbeckia, vinca and zinnia.

ON HER MAJESTY'S SERVICE

GOVERNMENT OF BERMUDA
Department of Environment and Natural Resources

PUBLISHED BY: GOVERNMENT OF BERMUDA • DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES • BOTANICAL GARDENS • 169 SOUTH ROAD • PAGET • DV04 • BERMUDA • DESIGN: DEPARTMENT OF COMMUNICATIONS