Envirotalk

GOVERNMENT OF BERMUDA

Department of Environment and Natural Resources

SUMMER 2022
VOLUME 86 No. 2

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

WELCOME

to our summer edition of Envirotalk.

In this issue –

- Dr. Mark Outerbridge tells us why every animal found in a fish's mouth may not be its dinner...
- Alison Copeland describes Bermuda's three most common land crabs
- Native Plant Spotlight on the Beach Lobelia (*Scaevola plumieri*)
- Climate wise Bermuda Seagrass Project announces an upcoming talk at BUEI

Also See:

- Our **News & Notices** for reminders and upcoming events
- The **Planting Calendar** to get a head start on what to plant this summer.

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

THE WEIRD AND NOT SO WONDERFUL TONGUE-EATING LOUSE

Here is a story to make your skin crawl; meet *Cymothoa oestrum*, otherwise known as the tongue-eating louse. Distantly related to the pill bugs (or roly polys) found on land, this parasitic marine isopod occupies a very specialized niche in nature. It enters the mouth of a fish and uses its hooked legs to attach itself to the tongue. The parasite quickly severs the blood vessels in the fish's tongue, which causes it to wither and eventually disappear altogether. The parasite then replaces the fish's tongue by attaching its own body to the muscles of the tongue stub. This happens to be the only known case where a parasite functionally replaces a host's organ, and amazingly the parasite apparently does not cause further harm to the host fish. There are hundreds of tongue-eating isopod species in the world's oceans, and most target a specific type of fish as their host. *Cymothoa oestrum* is found around Bermuda, grows to around 1.5 inches in length, and has developed a taste for local jacks. The tongue-eating louse is not harmful to humans, although it may bite if separated from a fish and handled too much. If the host dies, the louse will detach itself from the tongue stub and leave the mouth, presumably in search of another mouth…..

No, that is not dinner – it is the fish's tongue.
Internet image

By Dr Mark Outerbridge
Senior Biodiversity Officer

GETTING TO KNOW BERMUDA'S LAND CRABS

Bermuda has a myriad of crabs. They come in all shapes and sizes, and live in a variety of habitats – from the tiny Sargassum Crabs found in floating seaweed and the oddly shaped Mole Crab that lives under beach sand, to the large Sally Lightfoot that can be seen scuttling in and out of the surf along the rocky shore; and the Mangrove Crab which lives in the mud below its namesake trees. Arguably the most fascinating though are the truly terrestrial crabs. Using various strategies to keep their gills wet, land crabs have adapted to live on land after hatching from eggs floating as plankton in the ocean.

Bermuda has several species of terrestrial crabs, but it is the larger species that people most often encounter, so it is those I will briefly describe in this article.

The Red Land Crab

The Red Land Crab or Blackback Land Crab (*Gecarcinus lateralis*) was at one time one of the most commonly seen native animals in Bermuda. As a child in the late 1980's I remember seeing them squashed on South Shore Road in their hundreds. Now, when I tell students this, they look at me unbelievingly since most of them have never seen a Red Land Crab. As the name suggests, the legs and claws of the Red Land Crab are reddish brown or bright red, and the centre of it carapace (the shell of its head and back) is purple, ranging from bright violet to almost black (Fig. 1 a). They can grow up to 4 inches or 10 cm wide.

Figure 1: The back (a) and underside (b) of the Blackback or Red Land Crab (Photo b: Luke Foster)

Red Land Crabs live in burrows they dig in the sandy soil in coastal woodlands and the dunes behind beaches. They eat a variety of vegetation, will scavenge dead animals, and are active predators of smaller invertebrates (Sterrer, 1992). In the past when they were extremely abundant, the burrowing and eating habits of the Red Land Crab put it into conflict with people. They would dig holes all over our golf courses, chew on fields of crops and damage peoples gardens. Poisons were used to reduce their numbers, and in the 1980's the Yellow-crowned Night Heron was introduced as a biological control. Coastal developments in their habitat, and people collecting them to use as fishing bait have also reduced the numbers of Red Land Crabs left in Bermuda. They can still be found though. A careful exploration of vegetated sandy areas, particularly on South Shore, will yield crab burrows. The crabs are nocturnal – meaning they avoid the heat of the day in their burrows, and come out at night, or sometimes on rainy or cloudy days. They are not as active in the winter time when the temperatures drop below 70°F (21°C) (Dunstan, 1959).

The Giant or Blue Land Crab

The Giant Land Crab (*Cardisoma guanhumi*) can be distinguished from other terrestrial crab species in Bermuda by its large size, and the significantly different sizes of the two major chelipeds (the large front claws). These crabs can be either right or left 'handed' i.e. the bigger of the two claws is equally likely to be on the right or left. The last time I had to relocate a full grown Giant Land Crab his largest claw was bigger than my hand, and would easily have fit around my wrist. They can weigh up to 500 grams or just over a pound, and the body or carapace can grow up to 6 inches wide (15cm). When they are adults, Giant Land Crabs vary in colour from dark bluish purple, to bright blue, lavender or a light grey (Fig. 2). The colour depends on the gender and age of the crab and will change over its lifetime.

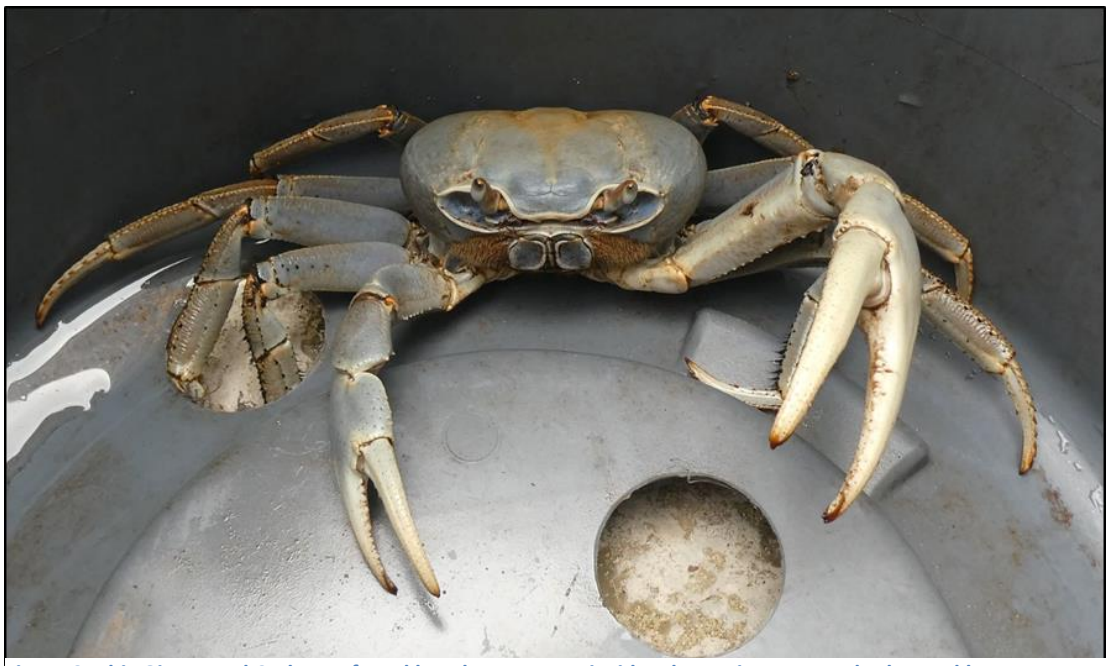

Figure 2: This Giant Land Crab was found by a homeowner inside a house in Paget and relocated by DENR (Photo: Alison Copeland).

Like the Red Land Crab, the Giant Land Crab is a burrow-dweller; but its holes are substantially bigger. Giant Land Crabs dig down through muddy soil until they reach the water table to create a pool at the bottom of their burrow where the crab can keep its gills wet, and maintain a constant temperature. Giant Land Crabs eat all kinds of plant material including fruits, flowers, grasses and leaves; as well as scavenging dead animals and eating insects. They are fond of Red Mangrove and Buttonwood leaves.

The Land Hermit Crab

The Land Hermit Crab (*Coenobita clypeatus*) can be easily distinguished from other crabs because it is the only land crab in Bermuda that uses the shell of another animal to protect the soft parts of its body. Hermit crabs have narrow heads and five pairs of jointed legs, with the first three pairs visible outside of its shell.

The front pair end in large claws used for eating and other tasks, and the other pairs are used for walking. The legs and claws vary in colour depending on the age of the crab. They can be red, orange, grey, peach or bright purple. In Bermuda Land Hermit Crabs are most often seen wearing the shell of the West Indian Topshell as their shelter (Fig. 3), but they also use the shells of smaller marine snails like the Beaded Periwinkle and various types of Nerites. Occasionally they will pick up the shells of land snails like the Milk Snail (Fig. 4).

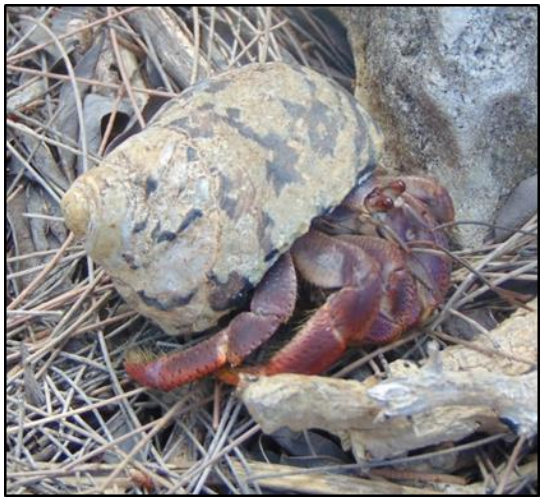

Figure 3: Land Hermit Crab wearing a West Indian Topshell (Photo: Alison Copeland)

Figure 4: A young land hermit crab wearing the shell of the terrestrial Milk Snail, south shore Bermuda. (Photo: Andrew Dobson).

Historically land hermit crabs would have roamed the coastal forests, beaches and rocky coasts of Bermuda. Today they are typically found in undeveloped areas of shrubby coastal vegetation adjacent to the rocky shore, and in the vegetated dunes at the back of sandy beaches. The population of *Coenobita*

clypeatus has never been calculated for Bermuda but was estimated at 150 in the early 1990's (Walker, 1994). The local population is unlikely to be larger than a few hundred crabs.

Both the Giant Land Crab and Land Hermit Crab are legally protected in Bermuda under the Protected Species Act 2003. Management plans for these species have been written, which contain more information, and these can be found at https://environment.bm/species-recovery-plans.

Despite being mostly terrestrial, or 'land-based' animals, all three of Bermuda's land crab species must return to the ocean to breed. The female crabs make their way down low rocky shores or onto beaches at night in the summer months to release their eggs into the sea. The eggs float in the plankton and hatch into tiny crabs, which then make their way back onto land again. It is during these summer breeding migrations that people are mostly likely to encounter the Red, Giant or Land Hermit Crabs. They are undertaking a vital part of their life cycle, and should be left alone to get on with it. Occasionally people report to us that they have found a crab in the road, or inside their house or garage. If at all possible, give the crab an escape route, and let it go about its business. If it is trapped, or in immediate danger you can contact DENR for advice (phone 293-2727 / weekday email: environment@gov.bm).

References

- Dunstan, A. G. January 1959. Land crabs and their control. Bulletin Bermuda Department of Agriculture. BAMZ # 128.
- Sterrer, W. 1992. Bermuda's Marine Life. Bermuda Zoological Society. pp307.
- Walker, S.E. 1994. Biological Remanie: Gastropod fossils used by the living terrestrial hermit crab Coenobita clypeatus, on Bermuda. Palaios Vol. 9, pp 403-412. BBSR#1347.

NATIVE PLANT SPOTLIGHT: BEACH LOBELIA (*Scaevola plumieri*)

Welcome to the native plant spotlight. In the upcoming editions, we will be using this space to highlight plants that are endemic or native to Bermuda, and encouraging their use in gardens and landscape designs.

As it is summer time, we are going to start our series with a beach plant. The Beach Lobelia is found along the back of many of the South Shore beaches, where it forms large single-species patches, growing from the beach sand (Photo 1). It is also found further up the shore, mixed with other coastal herbs and grasses in vegetated sand dunes and coastal hillsides (Photo 2). A good place to see it is along the back of Horseshoe Bay beach.

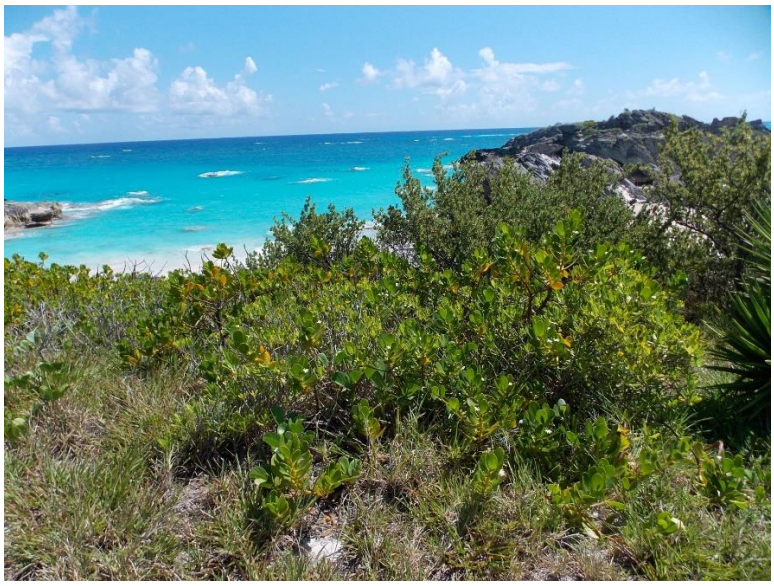

Photo 1: Beach Lobelia on the footpath at Horseshoe Bay, and Photo 2: Beach Lobelia among grasses and shrubs above Chaplin Bay.

Beach Lobelia is a succulent plant that is adapted to salt spray and sandy soils, with low nutrients and little available water or shade. These traits allow it to survive in harsh coastal habitats, and make it a good choice for a low maintenance planting. Appropriate uses would be planters in sunny places like car parks, as well as in coastal gardens. The Beach Lobelia flowers from spring to autumn. The flowers are a unique fan shape, with all 5 of the white petals on one side (Photo 3). The flowers are popular with bees, who pollinate them to produce round juicy berries which turn from green to black as they ripen (Photo 4). It is due to the black berries that this plant is also sometimes called 'inkberry'.

Beach Lobelia is native to Bermuda, with the seeds likely first arriving on our shores by floating on ocean currents. Beach Lobelia is also native to the shores of the Caribbean Sea and Gulf of Mexico. Unfortunately in Bermuda we also have another related plant, the Beach Naupaka. Beach Naupaka is native to the Pacific, but has become invasive in the Caribbean where it outcompetes the native Beach Lobelia. Anyone wishing to use Beach Lobelia in their planting scheme should consult our visual guide to telling these two plants apart to be sure they are not planting the invasive Beach Naupaka. The main differences are that the berries of the invasive are white, while on the native they are black; and the leaves of the invasive roll

down at the sides, while in the native they roll up. The two species can be seen growing together on the footpath behind Chaplin Bay, Stonehole Bay and Jobson's Cove.

Photo 3: The fan-shaped white flowers of Beach Lobelia. Photo 4: Unripe green berries, and ripe black berries on Beach Lobelia.

Gardeners looking for help with plant identification are welcome to email the Department at environment@gov.bm

Resources for further reading

*Link to 'Beach Naupaka or Beach Lobelia' poster on www.environment.bm
*Link to An illustrated guide for Bermuda's indigenous and invasive plants on www.gov.bm

Upcoming events

Join Dr. James Fourqurean and learn about
The Links between Bermuda's Seagrass, Carbon Storage, and Global Warming
Thursday 4th August 2022 at 6pm, BUEI Auditorium

Dr. Fourqurean is a seagrass ecologist and professor at Florida International University. He is a lead scientist in the International Blue Carbon Scientific Working Group of the International Blue Carbon Initiative, and scientific representative to the International Blue Carbon Policy Working Group. Dr. Fourqurean was instrumental in initiating the Bermuda Department of Environment and Natural Resources Seagrass Monitoring Program in 2007.

The talk is open to the public and entry is FREE
Talk starts at 6pm
Come early and enjoy the BUEI Seagrass Restoration Exhibit.
For more information contact smanuel@gov.bm

climate wise
Bermuda
Seagrass Project

GOVERNMENT OF BERMUDA
Ministry of Home Affairs
Department of Environment and Natural Resources

FIU FLORIDA INTERNATIONAL UNIVERSITY

News & Notices

Lobster Statistics Reminder

Recreational lobster divers are reminded that their catch statistics for the 2021-22 season must be submitted online (using the portal at www.fisheries.gov.bm) **by the end of April**. 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 2022-23 lobster season. Please call 2935600 or email fisheries@gov.bm if you are having difficulties accessing the portal.

Spearfishing Reminder

The annual licensing period for recreational spearfishing runs from September 1 through August 31 of the following year, and DENR will be taking applications for 2022-23 licences from Monday, August 1, 2022. Recreational spear fishers are reminded that their spearfishing statistics should be submitted monthly using the online portal at www.fisheries.gov.bm. Statistical reports must be up to date before applying to renew your licence. Please call 2935600 or email fisheries@gov.bm if you are having difficulties accessing the portal.

Recreational lobster diving licences

The **2022-2023** lobster season will begin on Thursday, September 1, 2022. DENR will be taking applications for recreational lobster diving licences for the upcoming season at the main offices in the Botanical Gardens from Monday, August 1, 2022. As with the last few seasons, there will be a cap on the number of licences, which will be issued on a first come, first served basis.
Please note that if you held a lobster diver licence for the 2021-22 season and did not submit any statistics then you will NOT be granted a licence for the upcoming season. This decision has been made at the ministerial level, in consultation with the Marine Resources Board, and exceptions cannot be granted by DENR staff. Anyone who acts in an abusive manner towards any staff member will be given a two-year suspension.

Seasonally closed protected areas

The North Eastern and South Western Seasonally Closed Areas, also known as 'the hind grounds,' are currently closed to fishing, and will remain closed through the 14th of August 2022 (the first day they can be fished is August 15th). Also, the extended closure areas, known as the 'grouper boxes', within the seasonally closed areas are currently closed to fishing, and will remain closed through the 30th of November 2022. The coordinates for these areas can be found at: https://www.gov.bm/bermudas-nofishing-areas

Planting Calendar – What to plant in the summer…

VEGETABLES

June
Beans, Cucumber, Squash, Tomato

July
Beans, Carrots, Tomato

August
Beans, Broccoli, Brussels sprouts, Cabbage, Carrots, Kale, Leeks, Mustard Greens, Pepper, Radish, Rutabaga, Tomato

September
Beans, Broccoli, Brussels Sprouts, Cabbage, Carrots, Cauliflower, Celery, Chard, Cucumber, Eggplant, Kale, Leeks, Mustard Greens, Parsley, Pepper, Potatoes, Radish, Rutabaga, Tomato, Turnip.

FLOWERS

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

July
Celosia, cosmos, gazania, globe amaranth, impatiens, marigold, salvia, snow-on-the-mountain, vinca and zinnia.

August
Celosia, cosmos, gazania, globe amaranth, impatiens, marigold, salvia, snow-on-the-mountain, vinca and zinnia

September
Celosia, cosmos, gazania, globe amaranth, impatiens, marigold, salvia, snow-on-the-mountain, vinca and zinnia.

GOVERNMENT OF BERMUDA

Department of Environment and Natural Resources

ON HER MAJESTY'S SERVICE

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