



ATLANTIC
CONSERVATION PARTNERSHIP
BERMUDA
ZOOLOGICAL SOCIETY

**The Sargasso Sea
should be protected**



‘We saw great quantities of weed. It was coming from the West’

— Christopher Columbus, secret log, September 17, 1492

Golden Floating Rainforest

The “golden floating rainforest of the Atlantic Ocean,” as oceanographer Sylvia Earle has called the Sargasso Sea, covers nearly five-million square kilometres of an elusive, shifting ocean bounded by the Gulf Stream and other currents. Roiled by hurricanes and becalmed in the doldrums, the Sargasso Sea is one of the world’s most productive marine ecosystems, feeding, spawning and acting as both a nursery ground and migratory corridor to many endangered and commercially harvested species. There is emerging recognition of the crucial role it plays in the entire ecosystem of the Atlantic, Caribbean and Gulf of Mexico. But today this important habitat is threat-



LookBermuda

ened by a myriad of human uses—from overfishing and seabed mining to biofuel harvesting and pollution from plastics, oil and bilge. Its beauty, richness and value need protecting if we are to continue to benefit from this unique ecosystem.

Drifting just beneath the surface, the “golden jungle” is made up of *Sargassum* seaweed (mainly *S. natans* and *S. fluitans*), which spends its entire life adrift, and reproduces by simply growing and breaking apart. Branched fronds lock together to form rafts that are home to a charming bunch of camouflage-coloured creatures. To meet them, just dip some *Sargassum* up in a bucket and shake it in seawater—what looks like another bit of weed may all of a sudden crawl or scuttle away, and turn out to be a **shrimp** (*Latreutes fucorum*), a **sea slug** (*Scyllaea pelagica*), a crab (*Planes minutus*), a pipefish (*Syngnathus pelagicus*) or, most bizarre of all, the voracious **Sargassum fish** (*Histrio histrio*). Flyingfish (*Hirundichthys* spp.) build bubble nests in the weed, and the drifting carpet usually shelters the juveniles of many larger fish. At least 10 of 145 species of invertebrates and 125 fishes associated with Sargassum are found only here.



Chris Burville, LookBermuda

Sargassum shrimp

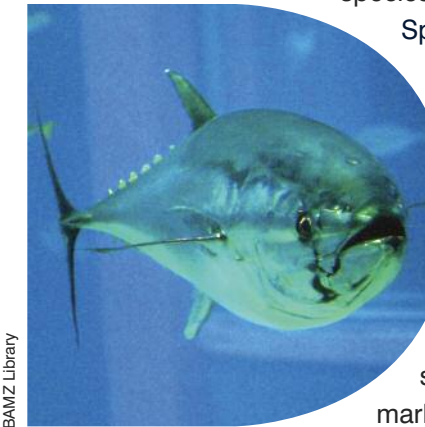


J-P. Rouja, LookBermuda

Sargassum fish

Many migrants

The Sargasso Sea is used by scores of visiting and migrant species, including the ocean’s giants—for example, the Sperm whale (*Physeter macrocephalus*), Whale shark (*Rhincodon typus*), and Leatherback turtle (*Dermochelys coriacea*)—nearly all now on CITES and/or the IUCN Red List of Threatened Species. While some, such as both eastern and western **Atlantic bluefin tuna** (*Thunnus thynnus*), are known to only pass through, others use the Sargasso Sea during a critical phase of their life cycle. Billfishes such as the White (*Tetrapturus albidus*) and Blue marlin (*Makaira nigricans*), and the Albacore tuna (*Thunnus alalunga*) spawn here. The Porbeagle shark (*Lamna nasus*) travels from as far as Canada to give birth to live young, and Tiger sharks (*Galeocerdo cuvier*) spend months at a time in the blue waters. To feed? To mate? To give birth? We do not know.



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Bluefin tuna



Andrew Stevenson, Whales Bermuda

Humpback whale

Of 30 species of whales and dolphins living in the Sargasso Sea, **Humpback whales** (*Megaptera novaeangliae*) are best known for their elaborate courtship songs, first recorded off Bermuda in 1953. But they are also among the longest-distance travellers anywhere. Named “Big-winged New Englanders” for their long pectoral fins, their North Atlantic population spends summers feeding on plentiful krill and herring along the northeastern American coast, but in the fall migrates to the Caribbean where calves are born. As whales return north in the spring, they faithfully pass Bermuda using the island as a beacon, and maybe a first feeding stop.

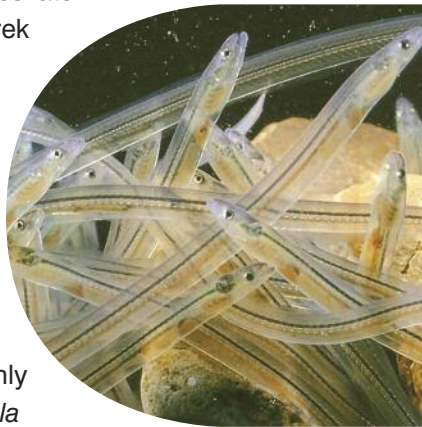
Sea turtles

The Sargasso Sea is home and nursery ground to all five Atlantic **sea turtles**—all on the *IUCN Red List*. Heading to deep water immediately after hatching from their native beach, baby Green turtles (*Chelonia mydas*) literally get lost until, a few years later, they reappear, 10 pounds heavier, in the shallows of islands at the periphery of the Sargasso Sea. It is now clear that during these “lost years,” juveniles shelter, feed and grow in *Sargassum* until they settle on islands such as Bermuda to mature. Several decades later they embark on yet another long-distance trek that will take them home to their breeding grounds, usually off the very beach on which they were born themselves.



Green Turtle

Chris Burville, LookBermuda



Atlantic eel larvae

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Yet the most elusive long-distance voyager is the **Atlantic eel**, both as a fat adult and a minute translucent larva—but despite its economic importance, and more than a century of research, its life cycle is only sketchily known. Both the European (*Anguilla anguilla*) and the American eel (*A. rostrata*), which differ slightly but consistently, are born in the Sargasso Sea—yet questions such as where, how, and at what depth are still a mystery. After one to three years of travel, the larvae (glass eels) reach the shores of Europe and North America, respectively, where they are caught in huge numbers as they enter river estuaries, to migrate into freshwater streams and lakes. Steep declines in the stock size and recruitment levels of the European eel from the 1980s on may be caused by overfishing as well as changes in oceanographic features and food availability in the Sargasso Sea.



Cahow

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Seabirds

At least 27 **seabird** species—petrels, tropicbirds, and terns—are associated with *Sargassum*, including the iconic **Bermuda cahow** (*Pterodroma cahow*). This pigeon-size relative of the albatross once bred in Bermuda by the millions, but proved to be no match for

people, hogs and rats. It was considered extinct only 10 years after human colonisation. Yet 300 years later, a few breeding pairs were discovered, and the species has now been nurtured back from the brink of extinction in one of the most spectacular rescue efforts in animal conservation.

Surface to Deep Sea

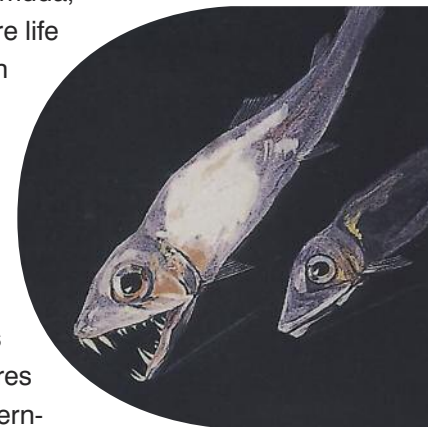
The *Sargassum* community is suspended among a myriad of other organisms large and small, from the surface, where the formidable Portuguese-Man-o'-War jellyfish (*Physalia physalis*) is stalked by the **Blue ocean slug** (*Glaucus atlanticus*), to schools of lantern fish (*Myctophum* spp.), **gulpers** and anglers in mid-depths, down to the abyssal plains at 4,000 metres where the elusive **Giant squid** (*Architeuthis dux*) roams.



Blue ocean slug

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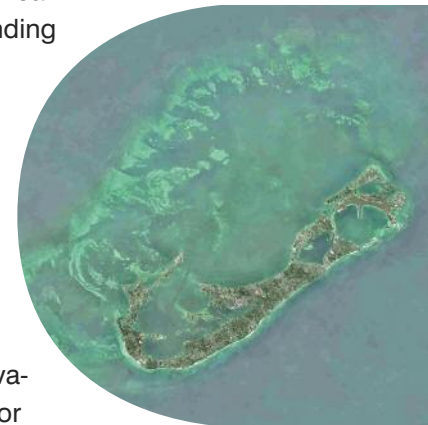
William Beebe in 1932 pioneered the first *in situ* observations of deep-sea animals off Bermuda, drawing attention to the diversity of bizarre life forms and their daily vertical migrations in search of sunlight and food. Much of the life along the flanks of the seamount and the microcosms of the surrounding deep sea is still awaiting discovery.



Deep sea fish

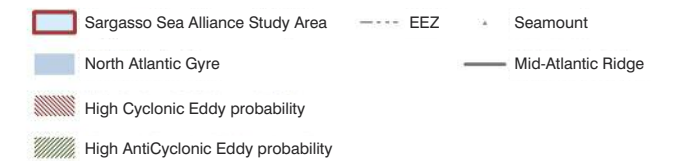
Eisa Bostelman

Lone *terra firma* in the Sargasso Sea, the 50-square-kilometre island of Bermuda is surrounded by some 500 square kilometres of **shallow coral reefs**, the world's northernmost. Recorded in more than 8,000 publications, Bermuda's natural history continues to reveal significant environmental insights. The finding of pernicious DDT in the eggshells of the open ocean-feeding cahow, for example, led to the pesticide's ban in the 1960s. A decade later, chronic oil pollution on Bermuda's beaches was traced to tanker operations, which brought about cleaner shipping practices. Just south of Bermuda, “Hydrostation S,” the world's longest time-series of deep-ocean observations, has provided significant evidence for global climate change. And *Prochlorococcus*, dubbed “the most important microbe you've never heard of,” was discovered in the Sargasso Sea only 20 years ago but is now considered the most abundant photosynthetic organism on Earth; it produces 20 percent of the oxygen in the atmosphere and plays a major role in the emerging view of the Sargasso Sea as probably the most productive region in the world's oceans.



Bermuda reefs

Bermuda Zoological Society



Sargasso Sea: Marine Protected Area and Global Watchtower

Being furthest from coastlines and urban centres, the Sargasso Sea is paradoxically also the ultimate destination and integrator of wastes and changes generated by human civilisation, and hence the most sensitive “canary in the global coal mine.” Bermuda, with its long and distinguished record of ocean and climate research, is well positioned for assuming stewardship of the Sargasso Sea, both as the first oceanic Marine Protected Area, and as a vital indicator of the global environment's state of health.

Launched in 2010, the **Sargasso Sea Alliance** is a partnership led by the Bermuda government in collaboration with scientists, international marine conservation groups and private donors who share the vision of protecting the Sargasso Sea. The **Bermuda Alliance for Sargasso Sea (BASS)** is supporting efforts by the SSA to establish the Sargasso Sea as a high seas protected area through research, education and community awareness. BASS members are Atlantic Conservation Partnership; Bermuda Underwater Exploration Institute; Bermuda National Trust; Greenrock;

Bermuda Institute of Ocean Science; Bermuda Sloop Foundation; LookBermuda Education Foundation; National Museum of Bermuda; Bermuda Audubon Society; and Bermuda Zoological Society.



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