I'm not a bot

By Kate UnderwoodPublished June 14 2023, 3:36 p.m. ETSource: Getty ImagesArticle continues below advertisementSource: Getty ImagesStaghorn coral, NOAA Fisheries explains, is an important Caribbean coral, found largely in the Caribbean, as well as in the Bahamas and parts of Florida. These corals form thickets, or dense groups, in shallow water, providing a habitat for numerous reef fish and other creatures. Staghorn coral is often found among elkhorn coral and star coral.Article continues below advertisementHowever, the future of staghorn corals isn't quite certain. Due to ongoing climate change concerns and disease, scientists are working to conserve and recover staghorn coral populations.Although staghorn coral is one of the fastest-growing coral species, able to grow up to 8 inches per year, it is classified as a threatened species under the Endangered Species Act. Unfortunately, 97 percent of the staghorn coral population disappeared due to white band disease, per NOAA Fisheries. Disease may impact staghorn coral by killing the adult coral, reducing reproductive success rates, and hindering colony growth. Article continues below advertisementAs National Geographic reports, several factors threaten the staghorn coral's survival. Climate change, unsurprisingly, lands at the top of the list. One aspect of climate change is the higher water temperatures: this causes the staghorn coral to "evict" its symbiotic algae, which impacts the level of energy they create. Article continues below advertisementCoral bleaching is another aspect of the climate crisis harming the staghorn coral's chances. This removes the colorful pigments of the coral and makes it more vulnerable to disease — and staghorn corals are especially susceptible to the damage of bleaching. Ocean acidification is also harming the reefs, as carbon dioxide is absorbed into the ocean and reducing reef-building rates. Staghorn corals also face ocean predators, including the crown-of-thorns starfish that can take out large swaths of the coral reef. Article continues below advertisementOf course, given how crucial all coral reefs are and how integral the staghorn coral is to the overall reef ecosystem, you may want to do your part to help. A number of reputable organizations accept donations to support ocean conservation, which often includes conservation and restoration of coral reefs. Article continues below advertisementAside from contributing financially for conservancy, remember there are everyday actions to take, as the EPA notes. Be sure to reduce your waste and consumption, recycle and dispose of trash responsibly, avoid using fertilizers if possible, use eco-friendly transportation whenever possible, and minimize use of lights and electronics whenever possible — we have endless guides to reducing your impact here on Green Matters.Take care when you visit a coral reef as well. You can help protect coral reefs by not touching or anchoring onto the reefs. And of course, use a reef-safe or reef-friendly sunscreen when you're outdoors to avoid adding toxic chemicals to the water. Latest Weather & Global Warming News and Updates Federal Status: Threatened FL Status: Federally-designated Threatened FNAI Ranks: Not ranked IUCN Status: CR (Critically Endangered) Staghorn coral received its common name due to its resemblance to male deer antlers (National Oceanic & Atmospheric Administration, n.d.). Its tan-colored branches can reach a length of 6.5 feet (two meters). The staghorn coral’s upper growth is determined by wave forces, while the lower growth is determined by the availability of light and the quantity of suspended sediments (National Park Service, n.d.). Staghorn coral also contain stinging cells (nematocysts) on their tentacles that are used for capturing food. It is the fastest growing species of coral in western Atlantic waters, growing at a rate of four to eight inches (10.2-20.3 centimeters) every year (National Park Service, n.d.). Staghorn coral harbors symbiotic (depends on the host as the host depends on it to survive) zooxanthellae [autotrophic (creates own food through photosynthesis) dinoflagellates] which photosynthesize and provide energy in the form of carbon compounds (amino acids, glucose, etc.) to the colony. They also feed on zooplankton (National Oceanic & Atmospheric Administration, n.d.). Staghorn coral primarily reproduces asexually; however, they are capable of producing sexually. During asexual reproduction, or asexual fragmentation, branches of coral break off and attach to the ocean floor. Sexual reproduction occurs only once per year in August or September. Staghorn coral is a broadcast spawner - releases eggs and sperm into the water for fertilization. Larvae will live in plankton for several days until a proper habitat is located to settle in and metamorphose. Observations from recent years have supported that larvae rarely survive to metamorphose and develop colonies (National Oceanic & Atmospheric Administration, n.d.). Staghorn coral can grow anywhere from the water surface to 100 feet (30.5 meters) below the surface in marine waters (National Park Service, n.d.). This species can be found from Boca Raton, Florida, south to Venezuela (National Park Service, n.d.). As global climate change continues, all coral face the threat of bleaching, sea level rise, ocean acidification, and increased frequency and intensity of hurricanes. Bleaching occurs when the coral’s habitat is degraded enough to the point where their symbiotic zooxanthellae (dinoflagellate) are expelled by the host, thereby causing loss of pigmentation to the colony. Global climate change causes an increase in the temperature of marine waters which is detrimental to the coral. Ocean acidification, also a byproduct of global climate change, can impair coral skeleton calcification rates and erode existing reefs. Hurricanes also pose a threat as their intense storm conditions can cause damage to the coral. Staghorn coral also face the threat of disease like the white plague disease, a bacterial (Aurantimonas coralicida) disease that destroys tissue. Sedimentation of its aquatic habitat threatens the staghorn coral, as the increased sediment prevents light from reaching the lower portion of the coral preventing lower growth. Other threats include extreme variations of water temperature and salinity, and physical colony damage caused by anchors and boats. National Park ServiceU.S. Geological SurveyPrintable version of this page National Oceanic and Atmospheric Administration. (n.d.). Staghorn Coral (Acropora cervicornis). Retrieved July 20, 2011, from NOAA Fisheries Office of Protected Resources:www.nmfs.noaa.gov/pr/species/invertebrates/staghorncoral.htm National Park Service. (n.d.). Staghorn Coral. Retrieved July 20, 2011, from Dry Tortugas: Acropora cervicornis is a species of staghorn coral that is predominantly found in Florida, the Bahamas, the Gulf of Mexico and the Caribbean. Comprised of approximately 400 different species of varying shapes and colours, staghorn corals are branching, stony corals that typically inhabit shallow tropical reefs and lagoons. As well as being some of the fastest growing corals in the world, staghorn corals are incredibly important for their contribution to reef growth and their role in providing habitats for marine life. In the Caribbean, Acropora cervicornis has played a fundamental part in the construction of coral reefs over the past 5,000 years and is widely regarded as one of the most important species in the region. However, an unprecedented disease incident in the early 1980s resulted in the loss of approximately 97% of the species’ cover, abundance, and occupied range. Remaining populations are generally isolated and display low colony abundance, thus increasing their susceptibility to threats of climate change, pollution, unsustainable fishing practices, and disease. With a population trend in punctuated decline, immediate restoration, conservation and monitoring efforts are needed to prevent the extinction of Acropora cervicornis. — FamilyAcroporidaeGenusAcroporaSpeciesAcropora cervicornisPopulationUnknownIUCN StatusCritically Endangered Acropora cervicornis colonies are typically tan or light brown with white tips, deriving their colour from the zooxanthellae (algae) residing within their tissue. Stemming out from a central trunk at an upwards angle, the cylindrical branches of A. cervicornis are typically two to eight centimetres thick and can exceed two metres in length. Colonies often grow to form interlocking frameworks known as thickets, however A. cervicornis colonies tend to be more open and loosely packed than other species of Acroporidae. Although often confused for plants or rocks, largely due to their sessile nature (permanently fixed in one place; immobile) corals are, in fact, animals. Corals are made up of hundreds of soft-bodied organisms known as polyps, which attach to a solid substrate (such as a rock or the dead skeletons of other polyps) and begin secreting calcium carbonate to create hard external skeletons, or corallites. As these polyp conglomerates continuously grow and reproduce, they begin to create these incredible hard, stony coral structures. Acropora cervicornis colonies tend to be more open and loosely packed than other species of the same family. Photo: Florida Fish and Wildlife Research Institute/Flickr. Most species of coral, particularly those inhabiting shallow, tropical waters, have two sources of food. Firstly, polyps have stinging cells, known as nematocysts, which they extend from out of their corallite to capture prey with, typically plankton. However, corals in shallow, warm environments derive most of their nutrition from the mutually beneficial, or symbiotic, relationship they have with the zooxanthellae (algae) that reside within the tissue of polyps. Zooxanthellae are plant-like organisms that utilise a coral’s metabolic waste products for photosynthesis. Having received these nutrients from the coral, the zooxanthellae then pass on some of the food they make to the coral. This symbiotic relationship, whereby corals receive food and oxygen in exchange for providing zooxanthellae with nutrients and shelter, plays a fundamental part in the rapid growth rate of tropical, shallow water corals. The distribution of Acropora cervicornis spans the western Atlantic, from Mexico (Veracruz), southern Florida, and the northern Bahamas, down south across the Caribbean Sea to Trinidad and Tobago, including the insular and coastal reefs of Barbados, Venezuela, Aruba, Curaçao, Bonaire and Colombia. The species is unlikely to occur further north than Palm Beach County, Florida, or further south than Trinidad and Tobago. Acropora cervicornis requires clear, oxygenated, warm waters in order to thrive, and is therefore typically found in tropical, shallow reef ecosystems. Although the species displays a preference for upper to mid-reef slopes and lagoons in regions with low or moderate wave exposure, A. cervicornis has been observed in a range of coral reef habitats, including spur and groove formations, bank reefs, patch reefs, transitional reef habitats, limestone ridges, terraces and hard bottom habitats. Despite a depth range of one to 60 metres, the species is rarely found beyond 25 metres from the surface of the water. Acropora cervicornis is considered one of the most important reef-building species in the Caribbean. Photo: Florida Fish and Wildlife Research Institute/Flickr. Staghorn corals are simultaneous hermaphrodites, producing both eggs and sperm but not self-fertilising. Upon reaching sexual maturity, typically at around 18 centimetres tall or three to eight years, a staghorn coral will reproduce once a year by broadcast spawning eggs and sperm into the water column. Fertilised eggs will then develop into larvae, settling on hard substrates in the region or drifting hundreds of kilometres away to form new colonies. Studies have indicated that low rates of larval recruitment are typical for this species in the Caribbean, and that recruitment by sexual reproduction is relatively rare despite high levels of gamete production and release. Nevertheless, staghorn corals can also form new colonies when fragments of a coral branch fall off, reattach themselves to a hard substrate, and continue to grow. More on the topic: Unpacking Florida’s Coral Reef Restoration Agenda As mentioned, Acropora cervicornis is regarded as one of the most important species of coral in the Caribbean due to its extensive contribution to reef growth and its role in providing a complex habitat for marine life, thus safeguarding the biodiversity of marine ecosystems in the region. In abundance, staghorn corals further provide shoreline protection from waves and storms. A. cervicornis, and coral reefs in general, also act as environmental indicators; their sensitivity to changes in the temperature, salinity, pollution levels, clarity, and pH levels of the waters they inhabit can inform scientists of any declines in the quality and health of ocean habitats. Although once found in high abundance across its endemic range, studies conducted on Acropora cervicornis have indicated a population decline of at least 80% over the past 30 years, with a current population trend in punctuated decline. As a result, the species has been classified as Critically Endangered under the International Union for Conservation of Nature (IUCN) Red List since 2008. Having suffered a staggering 98% decrease in cover, abundance and occupied range in the 1980s due to disease, and given its acute sensitivity to changes in environmental quality, remaining populations of A. cervicornis are currently isolated, display low colony abundance, and face a high risk of extinction. Major threats, which present themselves in a complex interplay, include climate change, pollution, and disease. Perhaps posing the greatest threat to coral reefs across the world is the phenomenon of climate change, as rising ocean temperatures, disrupted pH levels, increases in the severity of storms, and possible shifts in ocean circulation patterns have had disastrous effects on ocean habitats over the past decades. Acropora coral is highly vulnerable to bleaching, showing a lower tolerance for changes in water quality. Photo: Wikimedia Commons. Coral bleaching occurs when ocean temperatures rise at least 1C above the normal seasonal maximum, subjecting coral reefs to increased levels of stress. As a result, coral evict the symbiotic algae (zooxanthellae) from their tissue, causing the coral to turn white. Although the coral remains alive in this bleached state, it has lost one of its primary sources of nutrition and is thus rendered highly susceptible to disease. If exposed to prolonged heat, the coral will eventually die from starvation or disease. Staghorn corals, and Acropora cervicornis in particular, appear to have an especially low resistance and tolerance to bleaching, taking longer to recover than other species. In La Parguera National Reserve along the southwest coast of Puerto Rico, Acropora cervicornis displayed higher mortality rates due to temperature shifts and disease when compared to Acropora prolifera. After the occurrence of two global bleaching events in 1998 and 2010, the first mass, multi-year coral bleaching event took place between 2014 and 2017, where 30% of coral reefs experienced mortality-level stress. In April 2024, the National Oceanic and Atmospheric Administration (NOAA) detected evidence of a fourth, ongoing global bleaching event that commenced in February 2023. As bleaching events continue to occur with increasing frequency, coral reefs are prevented from ever fully recovering. In addition to absorbing heat, the ocean absorbs approximately 30% of atmospheric carbon dioxide, acting as a carbon sink. As carbon dioxide dissolves in seawater, the water becomes more acidic, causing a drop in its pH level. With carbon emissions steadily increasing over the past 200 years, reaching a record annual emission of 37.4 billion tonnes of carbon dioxide in 2023, oceans across the globe have become 30% more acidic as a result of absorbing this excess carbon dioxide. Commonly referred to as ocean acidification, this change in the ocean’s pH has reduced calcification rates in reef-building organisms since calcium carbonate only forms when the ocean’s pH level sits within a specific range. Perhaps of greater concern is the possibility that this increasing acidity could also prompt existing corallites and sediment platforms to dissolve away, causing entire reefs to disappear. In a study published in 2018, researchers determined that there is a specific low point in oceanic calcium carbonate levels, below which coral reefs dissolve faster than they can build. Compounding the vulnerability of coral reefs to disease and mortality is pollution. Runoff from agriculture, gardening, sewage, and costal development projects often contains toxins that affect the feeding habits, growth, reproduction, and ecological function of corals. This is particularly true of chemical and oil spills that occur in close proximity to coastal areas. Certain types of sunscreen can also cause extensive damage to coral reefs as they contain chemicals that induce coral bleaching, particularly in locations popular with snorkelling and diving. Excessive quantities of nutrients that are often found in fertilisers, such as nitrogen and phosphorus, further cause algal blooms that smother corals and affect the clarity of water. Deforestation and human development also typically intensify the process of soil erosion, which results in reefs becoming covered in silt. Since corals rely heavily on zooxanthellae to photosynthesise sunlight and supply them with nutrition, instances of prolonged declines in water clarity can expose coral reefs to the risk of starvation and disease. Additionally, pathogens found in untreated sewage can infect entire coral reefs, spreading into significant outbreaks. Plastic pollution also poses a significant threat to oceanic habitats across the world due to the myriad of detrimental consequences it has on marine ecosystems. Large pieces of trash that wash into coral reefs from shorelines can damage coral branches or block sunlight from reaching the zooxanthellae within their tissue. Microplastics, often mistaken for food particles, are regularly ingested by corals as the smell of plastic is masked by bacteria found on the plastic. This bacteria, which is introduced to reef habitats from land or the ocean’s surface, may also carry pathogens that can cause widespread infection or mortality. Once ingested, most pieces of plastic are expelled after 48 hours, however some may become embedded within the corallite. These embedded pieces can then begin leaking toxic chemicals, affecting the health of the coral. Plastic can often smother or harm coral, leak toxins, or break down into harmful microplastics. Photo: ARC Centre of Excellence for Coral Reef Studies/Flickr. With issues of warming ocean temperatures, acidification, and pollution having deteriorated the health and vitality of coral reefs over the past few decades, coral disease has increasingly become a major threat to species worldwide. According to a 2018 study, the rising prevalence of coral disease and mortality can be linked not only to thermal stress, but also reduced water quality and clarity, nutrient enrichment, plastic pollution, and sedimentation due to dredging. The results of a survey conducted on 159 reefs across the Asia-Pacific region indicated that the likelihood of coral disease increases 20-fold once reefs are exposed to plastic. White-band disease (WBD) is thought to be the primary cause for the aforementioned Acroporid disease event that has affected Caribbean reefs since the 1980s, although the prevalence of WBD in A. cervicornis is currently low due to the limited distribution and abundance of the species. Regardless, a mere 6% of remaining A. cervicornis populations have proven resistant to WBD thus far. Other major threats to A. cervicornis include: overfishing; unsustainable fishing practices, including dynamite fishing, chemical fishing, and dredging; changes in native species dynamics; human recreation and tourism; changes in the frequency and intensity of storms and hurricanes; as well as increased predation by Stegastes planifrons (Three-spot Damselfish), Hermodice carunculata (Bearded Fireworm), and Coralliophyllia spp. (coralivorous snail). Unsustainable fishing practices can have immense, long-term consequences on marine ecosystems, quickly altering the structure of a habitat from coral-dominated reefs to algal-dominated reefs (“phase shifts”) since the fish that consume algae are no longer around to maintain reefs clean and provide space for corals to grow. A. cervicornis is also among the most popular species of coral harvested for aquariums, with legal imports in the United States doubling from 2003 to 2009. Further hindered by restricted gene flow and low larval recruitment, A. cervicornis is unlikely to fully recover and regrow viable populations across its endemic range unless effective, holistic conservation, monitoring and repopulation efforts are put into place. When given the opportunity to recover in an ideal environment, coral have proven to be incredibly resilient. In addition to being listed under Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Acropora cervicornis has been further classified as ‘Threatened’ under the U.S. Endangered Species Act, as ‘Vulnerable’ under the Venezuelan national Red List, and as “Under Special Protection” under Mexico’s endangered species list. The species is also found in various marine protected areas (MPAs), such as the Florida Keys National Marine Sanctuary, Biscayne National Park, Dry Tortugas National Park, Buck Island Reef National Monument, Hol Chan Marine Reserve and Exuma Cays Land and Sea Park. Legislative measures such as these are of critical importance for safeguarding coral habitats, as they aim to reduce fishing pressures, prohibit trawling and dredging, limit tourism, and maintain clean, balanced ecosystems within which reefs can thrive. Complimenting legislative measures are localised efforts to propagate, reintroduce and restore Acropora cervicornis within its endemic range, such as in Florida, Mexico, Puerto Rico, the Dominican Republic, Jamaica, and Honduras. Regions regularly affected by ship groundings and hurricanes have attempted to salvage damaged reefs by reattaching corals in Acrpoprid habitats, which accelerates the growth of new coral. In the Caribbean, what began as 60 Acropora restoration programmes in 2012, focusing primarily on asexual propagation or ‘coral gardening’ methods, has since grown significantly both in the number and size of programmes, now implementing larval propagation techniques in the interest of genetic diversity and adaptive capacity. In collaboration with scientists and restoration practitioners worldwide, the Coral Restoration Consortium (CRC) has developed a geo-referenced database to monitor data collected from restoration programmes across the globe, ensuring that coral conservation efforts are in sync and as effective as possible. In the Dominican Republic, the Dominican Consortium of Costal Restoration has implemented in situ nurseries, coral gardens, and sexual propagation programmes, primarily led by Fundación Dominicana de Estudios Marinos (FUNDEMAR) and Fundación Grupo Punta Cana (FGPC). In Bayahibe, novel advances in sexual propagation strategies have resulted in the seeding of hundreds of thousands of sexual recruits. Acropora cervicornis close-up. Photo: Florida Fish and Wildlife Research Institute/Flickr. Due to the ever-growing threats of climate change, ocean acidification and disease, scientists have also shifted their focus towards more drastic interventions that aim at increasing the resistance of restored coral populations to thermal stress and disease. In Northwestern Australia, scientists have been studying a species of staghorn coral (Acropora aspera) that inhabit tidal areas and experience temperature swings of 7C as the tide goes in and out, enduring a maximum temperature of 32C. By studying the genetic profile of coral species that display an incredible resistance towards environmental stressors, researchers hope to transplant this coral globally to restore reefs in afflicted regions, or breed them with other species of coral to create offspring with better resistance to thermal stress. In addition to the genetic makeup of coral, another factor that appears to affect resilience to thermal stress and bleaching is the specific type of symbiotic bacteria that reside within the tissue of coral. As a result, scientists are attempting to apply topical probiotics that contain specific, beneficial strains of bacteria to protect coral species that are particularly susceptible to bleaching. You might also like: Exploring Costa Rica’s Trailblazing Efforts to Save Coral Reefs An artificial propagation technique known as cyrofreezing, or cyropreservation, has also gained traction as a potentially important tool for conservation. Pioneered by researchers at the Smithsonian National Zoo, technology typically utilised for human sperm banks has been applied to the preservation of coral sperm and stem cells. By retaining genetic material that can remain viable for years, conservationists hope that frozen gametes can be used to breed new coral colonies in the future, restoring populations with low abundance and genetic diversity. Continued advancements in stem cell research further present the possibility of regenerating frozen stem cells into mature individuals. The sperm of Acropora cervicornis has been preserved within coral bio-repositories in the United States. To further improve the efficiency and efficacy of conservation actions, continued research into Acropora cervicornis is of critical importance. Areas of research include: taxonomy; biology, behaviour and ecology; population; abundance and trends; habitat status; threats and resilience; restoration efforts; methods of identification; establishment and management of protected areas; recovery management; disease, pathogen and parasite management; and the success of current conservation strategies. In the US, the NOAA conducts research projects that track individuals to better comprehend population trends and causes of death, as well as testing the effects of temperature and acidification on eggs, sperm, larvae and newly settled colonies. With the continued collaboration of scientists and conservationists across the world, efforts to prevent the extinction of Acropora cervicornis have the potential to restore the species’ once immense abundance, cover, and occupied range. Practice ethical tourism. When snorkelling or scuba diving, take care when wearing flippers or swimming near to coral reefs as coral branches may break easily when kicked or stepped on. Do not touch any marine life, as you may be carrying foreign bacteria, and do not take anything from the ocean (aside from rubbish). Use reef-friendly sunscreen. Next time you go swimming in the ocean, make sure to apply a “reef-safe” or “reef-friendly” sunscreen which does not contain any oxybenzone and octinoxate, as these are two common UV-blocking chemicals. When coral come into contact with such chemicals, symbiotic bacteria are unable to photosynthesise, and the coral suffers from bleaching. Donate your time with beach and ocean clean ups. Plastic pollution in oceans and along beach fronts is incredibly harmful to the health and vitality of coral reefs. Donate your time to beach and ocean clean ups in your local area, or volunteer abroad to discover the various species of coral across the world. Acropora cervicornis staghorn coral. Credit: NOAA Fisheries Acropora cervicornis staghorn coral. Credit: NOAA Fisheries Staghorn coral is one of the most important corals in the Caribbean. It, along with elkhorn coral and star corals (boulder, lobed, and mountainous) built Caribbean coral reefs over the last 5,000 years. Staghorn coral can form dense groups called “thickets” in very shallow water. These provide important habitat for other reef animals, especially fish. In the early 1980s, a severe disease event caused major mortality throughout its range and now the population is less than 3 percent of its former abundance. The greatest threat to staghorn coral is ocean warming, which causes the corals to release the algae that live in their tissue and provide them food, usually causing death. Other threats to staghorn coral are ocean acidification (decrease in water pH caused by increased carbon dioxide in the atmosphere) that makes it harder for them to build their skeleton, unsustainable fishing practices that deplete the herbivores (animals that feed on plants) that keep the reef clean, and land-based sources of pollution that impacts the clear, low nutrient waters in which they thrive. NOAA Fisheries and our partners are dedicated to conserving and recovering the staghorn coral populations throughout its range. We use a variety of innovative techniques to study, protect, and restore these threatened corals. We engage our partners as we develop regulations and management plans that foster healthy coral reefs and reduce the impacts of climate change, unsustainable fishing, and land-based sources of pollution. World map providing approximate representation of the Staghorn coral's range Staghorn coral reaches reproductive maturity at about 7 inches tall. Staghorn coral is a simultaneous hermaphrodite, meaning each colony produces both eggs and sperm, but usually does not self-fertilize. Staghorn coral sexually reproduces once per year after the full moon in late summer by “broadcast spawning” eggs and sperm into the water column. Fertilized eggs develop into larvae that settle on hard surfaces and form new colonies. Staghorn coral can also form new colonies when broken pieces, called fragments, re-attach to hard surfaces. Staghorn coral is one of the fastest growing corals—when healthy, it can grow up to 8 inches in branch length per year. Life cycle of Acropora spp. Credit: NOAA Fisheries Animalia Cnidaria Anthozoa Scleractinia Acroporidae Acropora cervicornis Home › Sea Life › Coral Ecosystems › Staghorn Coral [Phylum: Cnidaria] [Class: Hexacorallia] [Order: Scleractinia (stony corals)] [Family: Acroporidae] Several global factors (e.g. climate change) threaten the survival of most corals found in shallow tropical reefs and lagoons because it interrupts the symbiotic relationship they have with algae. This section contains detailed facts and information about staghorn coral and the significance of healthy 'bush-like' coral species for fish families and other reef organisms. The common name used for this particular species of coral comes from its resemblance to the branching antlers of male deer. From solid bases anchored to ocean floors, staghorns start to produce cylinder-shaped branches, almost shrub-like in appearance. In some places, dense thickets of staghorn coral can reach almost two metres in height (6 feet) and ten metres in lateral growth (30 feet). Not many coral reef ecosystems grow faster than staghorns. In fact, it has an impressive growth rate of up to twenty centimetres per year (8 inches). These fast-growing reef-builders usually have a pale brown or dark grey colouring. But, other species can have a more vibrant appearance, including blue, pink, or even purple. Important: Staghorn corals found at dive sites in Southeast Asia have the scientific name of Acropora muricata (previously called Acropora formosa). But, Acropora cervicornis is a variety that is native to areas in Florida and the Caribbean. Is Staghorn Coral a Plant or Animal? In fact, all corals are animals - even though some actually look like they are a plant or a solid rock. These tiny reef producing corals are called polyps and they are examples of marine invertebrates that can create large underwater structures as they grow. Reef polyps vary in size, but many are as tiny as a pinhead. Even so, they often form large colonies by secreting a hard calcium carbonate shell to create a hard limestone skeleton. Note: In a nutshell, staghorn coral is an animal. It is alive and, unlike plants, it does not make its own food. Check out another section that answers the popular question of 'what is coral made of' in greater detail. What Does Staghorn Coral Need to Survive? Unfortunately, most staghorn species (such as elkhorn corals) start to die without clear, oxygenated, warm water - and limited wave action. Thus, you will find these animals more often in sheltered, shallow areas around five metres (15 feet). Nonetheless, healthy species can survive even at depths around thirty (30) metres (98 feet). Corals belonging to the Acropora genus use minute, stinging tentacles (cnidocytes) to eat their regular diet 'zooplankton'. In short, they hunt at night and feed by snatching these tiny aquatic animals that drift in the water column. Symbiotic Relationships for Extra Nutrition Most corals can enhance their diet through the absorption of nutrients created by zooxanthellae (single-celled algae). Algaes convert sunlight into energy, providing additional nutrients for corals to eat. Sequentially, Symbiodiniaceae (photosynthetic symbionts in cnidarians) are happy to use the tissues as a 'safe' place to live. Interesting Fact: The prefix 'phyto' defines the main difference between zooplankton and phytoplankton, as it refers to small plants (e.g. algae and diatoms). What Eats Staghorn Coral? In the main, there are two animal species that prey upon staghorn corals - butterfly fish and nudibranchs (a soft-bodied mollusk). Furthermore, large parrot fish species create another threat to staghorn's existence. They will bite off parts of the branches to get at its prey sheltering within. Staghorn Coral Reproduction Process Being hermaphrodites (bisexual animals) means they have male and female reproductive organs. Hence, staghorn corals can reproduce sexually and asexually. They will reproduce sexually one time per year, usually towards the end of summer. This is when they release huge clouds of eggs and sperm all together into the water column. Here's the thing: Staghorn coral colonies do not self-fertilise. Thus, they will need the sperm from a different colony for a successful fertilisation. Some of the fertilised eggs will develop into coral larvae (called planula) before they eventually settle in the benthic zone (seabed) and start to form new colonies themselves. Because they are one of the fragile coral species, it is common for a broken 'branch' of staghorn to attach itself to the substrate and start to grow after 'asexual reproduction'. Global Threats to Staghorn Corals The IUCN Red List of Threatened Species cites staghorn coral as being 'Critically Endangered'. Research shows that climate change and rising sea temperatures create the biggest threat to its survival (through coral bleaching). These fragile ecosystems are also susceptible to fatal coral diseases (e.g. pathogens, fungi, and bacteria). Some of the most severe spread at an alarming rate, killing entire colonies. Several other major threats include: Staghorn Coral Lifespan One of the lesser known facts about staghorn coral is that it has a low resistance and tolerance to bleaching. So much so that it often takes longer to recover than other classifications. Bleaching results in the removal of algae, which turns corals white. Despite being 'alive', this state renders it less resistant to stress and disease. In general, it takes three to five years of growth for the staghorn coral to mature. Studies suggest the generation length is around ten (10) years. In fact, healthy polyps can live for over one hundred years. Divers also enjoyed reading about... Staghorns are some of the fastest growing and most exceptional reef building corals. The number of staghorn species is unknown at this time, but it is estimated that there could be as many as 400 of various shapes and colors. Small, soft-bodied coral polyps, related to jellies and anemones, are the reef builders. Nematocysts or stinging cells help them capture prey. These corals are found in warm, sunny, clear tropical waters. They have a unique symbiotic relationship with zooxanthellae (photosynthetic algae) living within their tissues. Considered environmentally sensitive, these corals are affected by pollution, silting, ocean warming and ocean acidification. Originally published: May 17, 2018Last updated: June 04, 2024 A stand of staghorn coral in Netherlands Antilles, Bonaire. Credit: Bonaire 2008: Exploring Coral Reef Sustainability with New Technologies.; NOAA/OAR/OER Acropora sp. CONSERVATION STATUS: Data deficient CLIMATE CHANGE: Vulnerable At the Aquarium Staghorn corals are found in our Live Coral exhibit in the Tropical Pacific Gallery. Geographic Distribution These corals are found in the Indo-Pacific and Atlantic Oceans, mostly between 25 N to 25 S in suitable habitats. The Indo-Pacific corals are distributed from the west coast of Central America to the Red Sea and East Africa, with the most concentration in the “Coral Triangle” area of the Solomon Islands, Papua New Guinea, Indonesia, East Timor, Philippines, and Malaysia. The Atlantic group consists of two distinct species and one hybrid, found in the Bahamas, south-western Gulf of Mexico, and Caribbean coasts of Central and South America. Habitat Staghorn corals require clear, oxygenated, warm tropical waters and they can live to a depth of approximately 98 feet (30 meters) with gentle wave action. Physical Characteristics Staghorn corals form various shapes, from staghorn or upright branches to flat, plate-like structures and round, mounded clumps. Coral structures are built by many small animals known as polyps. These soft-bodied polyps have tentacles used for capturing prey. Each polyp will attach to a hard substrate and build its calcareous outer skeleton known as a corallite. The polyps live inside their corallite, extending their tentacles to capture prey. They have a symbiotic relationship with zooxanthellae, or photosynthetic algae, living within their tissues. Photosynthesis by the zooxanthellae provides the majority of the corals’ food, with food caught in its tentacles providing the remainder. These brightly colored corals may be green, blue, pink, or purple. They may also be red, brown, yellow, or cream colored. Tentacles tend to be white. Their zooxanthellae are a golden brown color. Size A single corallite may be less than 0.12 inches (3 millimeters). Staghorn coral branches can grow to over 6.5 feet (2 meters). Diet They receive the majority of their nutrition from photosynthetic zooxanthellae living within their tissues, with the remainder from plankton captured with their tentacles. Reproduction Staghorn corals reproduce both sexually and asexually. Sexual reproduction occurs when conditions are optimal. Eggs and sperm are released into the water where fertilization takes place. The high volume of gametes released often turn the water a milky white. Most Great Barrier Reef staghorns sexually reproduce soon after the full moon, from October to December. After fertilization takes place, the resulting larvae may settle quickly onto the reef or drift hundreds of miles away before settling on a substrate. Once settled, they secrete a calcareous material that will build their skeleton. Asexual reproduction occurs when a branch breaks off, reattaches to a substrate, and continues growing. Behavior Acroporas grow fast in order to out compete other corals and take over more reef space. Longevity Coral polyps can live from two years to hundreds of years. Conservation Coral reefs are in trouble worldwide from silting, bleaching, ocean acidification, climate change, disease and human activity. Deforestation and building activities on land cause soil to be washed from the land into the water, covering the reef. When a reef becomes silt covered, the zooxanthellae are no longer able to photosynthesize. Staghorn corals are very sensitive to water temperature. When water temperature rises, corals may expel their zooxanthellae on which they depend for much of their nutrition, a phenomenon known as bleaching. Ocean acidification, caused by the ocean absorbing massive quantities of carbon dioxide, is changing the ocean’s pH to become more acidic. A more acidic ocean has a direct impact on animals that make calcareous skeletons or shells. Climate change is causing more impacts on corals such as sea level rise, damage from increased storm frequency or intensity, and possible change in ocean circulation patterns. Any or all of the above serve to weaken the coral which opens the way for various disease causing pathogens or invasive species. Destructive fishing practices, anchoring on a reef, and trawls dragging across reefs serve to further destroy reefs. CONSERVATION STATUS: Data deficient CLIMATE CHANGE: Vulnerable GEOGRAPHIC DISTRIBUTION PHYSICAL CHARACTERISTICS Staghorn corals form various shapes, from staghorn or upright branches to flat, plate-like structures and round, mounded clumps. Coral structures are built by many small animals known as polyps. 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CoralsSPS CoralsStaghorn CoralScientific name: Acropora carduus (Dana, 1846)Gallery Acropora carduus, commonly known as Staghorn Coral, is a species of small polyp stony (SPS) coral renowned for its intricate, antler-like branches. This coral is highly sought after by reef aquarium enthusiasts for its striking appearance and the structural complexity it adds to the reef aquascape. Staghorn corals are fast-growing and can come in a variety of colors, including shades of brown, green, purple, and blue. Staghorn Coral requires stable water conditions and intense lighting to thrive in captivity. It is essential to maintain high water quality with low nutrient levels to prevent algae overgrowth on its branches. Strong water movement is also crucial to mimic its natural reef environment, which helps in delivering nutrients and removing waste. Calcium, alkalinity, and magnesium levels should be monitored and maintained to support its rapid skeletal growth. Symbiosis Acropora carduus does not have any specific symbiotic relationships that are unique or particularly noteworthy in the context of home aquariums. However, like many corals, it houses symbiotic algae known as zooxanthellae within its tissues, which provide the coral with energy through photosynthesis and contribute to its coloration. Habitat In the wild, Acropora carduus is typically found in shallow, sunlit reef environments where water flow is strong. It is a reef-building species that plays a crucial role in the structure and health of coral reefs. This species is distributed across the Indo-Pacific region, often forming extensive colonies that provide habitat for a diverse range of marine life. Common Name: Staghorn coralsScientific Name: Acropora muricataSize: Up to 20 inches longLike its name suggests, staghorn coral is a species of coral that looks a bit like the antlers of a male deer. Capable of growing into thickets up to five feet high and more than 30 feet across, staghorn corals produce long, cylindrical branches out of bases anchored to the ocean floor.Staghorn corals can grow up to two inches a year, making it relatively fast-growing. Colors range from dark gray and brown to more vibrant pinks, purples, and blues.Acropora muricata was formerly known as Acropora formosa. It should also be noted that there are other species commonly referred to as “staghorn coral,” including Acropora cervicornis, which is native to Florida and the Caribbean.Habitat and dietStaghorn corals occur in shallow tropical reefs, slopes, and lagoons from Israel and Jordan to the eastern coast of Africa and all the way out to islands in the Pacific, such as Vanuatu and Kiribati. The animals prefer water depths between 15 and 100 feet.Like other corals in the Acropora genus, staghorn corals use tiny, stinging tentacles to snatch and eat small aquatic animals known as zooplankton. Staghorn corals are also nocturnal predators, waiting until the sun goes down before they unfurl their tentacles and start hunting.Acropora corals are also known to harbor Symbiodiniaceae, a family of algae that creates nutrients for the coral by converting sunlight into energy by way of photosynthesis. In exchange, the algae get a place to live and protection from predators. This is what scientists call a symbiotic relationship.Threats to survivalClimate change is one of the biggest threats facing all coral species today, and staghorn corals are no exception.Higher than normal water temperatures cause coral to evict their symbiotic algae, which affects how much energy they can create. Removal of algae also turns corals white, a phenomenon commonly known as bleaching. While the coral remains alive in this ghostly state, bleaching renders it more susceptible to stress and disease.Unfortunately, staghorn corals seem to have a particularly low resistance and tolerance to bleaching and can take even longer to recover than other species.To make matters worse, coral diseases are also on the rise in the Indo-Pacific. Some studies have found links between warming surface temperatures and disease outbreaks.Staghorn corals are also vulnerable to certain predators, like the crown-of-thorns starfish (Acanthaster planci), which have proliferated since the 1970s. In large numbers, crown-of-thorns starfish can mow down wide swaths of coral reef.The International Union for Conservation of Nature (IUCN) reports that Acropora species are in the top three genera collected for the aquarium trade. This suggests unsustainable harvesting could also harm the species.Localized threats include invasive species, development, pollution, agricultural runoff, dynamite fishing, and tourism.ConservationThe IUCN considers staghorn corals to be near threatened. The good news is that at least one study has found that this species can be successfully transplanted to new areas. In the future, this could mean scientists may be able to help reestablish the species in areas where it has disappeared.While this species is not the focus of any targeted conservation plans, staghorn corals do occur in areas that have already been designated as protected. Researchers like National Geographic grantee David Obura, founding director of Coastal Oceans Research and Development—Indian Ocean (CORDIO) East Africa, are also investigating the threats facing all reef-building corals. Scientists recommend future research focus on the staghorn’s life cycle, habitat, and ability to withstand all of the numerous threats it faces. Captive breeding techniques may also one day be critical to the species’ survival, should staghorn coral populations continue trending downward.Furthermore, better regulation and oversight of the aquarium trade could help prevent too many staghorns being removed from the wild.Coral Reefs 101What are coral reefs? Coral can be found in tropical ocean waters around the world. But how much do you know about reefs and the tiny animals—polyps—that build them? Learn all about coral and why warming waters threaten the future of the reef ecosystem.

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