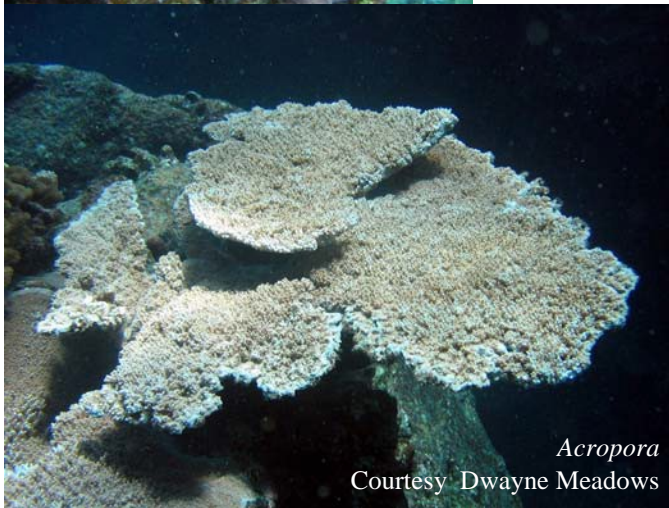




Pavona Courtesy NMFS



Acropora
Courtesy Dwayne Meadows

Marine Invertebrates

All Stony Corals

(All species listed in text)

Acroporidae

Agariciidae

Astrocoeniidae

Balanophyllidae

Caryophyllidae

Dendrophylliidae

Faviidae

Fungiidae

Pocilloporidae

Poritidae

Siderastreae

SPECIES STATUS:

IUCN Red List - Not considered
Some Endemic (see text for details)

SPECIES INFORMATION: All stony corals feed on small plankton or dissolved organic matter that is in the waters. Most corals use their nematocysts on their tentacles to capture and sting their prey and feed at night. Others such as *Pavona duerdenni* are suspension feeders. Stony corals with symbiotic zooxanthellae can get up to 98 percent of their nutrition from the sugars produced by the algae. *Balanophyllia* and *Tubastrea* lack zooxanthellae. Stony corals lack a polyp stage, but reproduce both sexually and asexually. A particular combination of day length, tide, and moonlight prompts spawning events. Other corals such as the *Pocillopora sp.* and *Porites sp.* brood their eggs and release the larvae or planulae completely formed. Asexual reproduction is achieved through budding or when pieces are broken off and grow into new colonies. *Porites spp.* are important habitat for many reef species such as juvenile fishes, shrimps and other invertebrates. All stony corals are protected under the Convention on International Trade in Endangered Species (CITES). Fenner (2005) has recently questioned the endemic status and taxonomy of many species. We have chosen to retain the taxonomy that has been in place for some time until Fenner's work can be evaluated and accepted by the wider community.

The following are the endemic stony corals of Hawaii and their common and Hawaiian names: serpentine cup coral (*Dendrophyllia serpentine*, also known as *Eguchipsammia serpentina*), Hawaiian plate coral (*Leptoseris hawaiiensis*), rice coral (*Montipora capitata*), irregular rice coral (*Montipora dilatata*), blue rice coral (*Montipora flabellata*), sandpaper rice coral (*Montipora patula*), branching rice coral (*Montipora studeri*, also known as *M. incrassata*), *Montipora verrilli* (no

common name), flat lobe coral (*Pavona duerdeni*), Moloka'i cauliflower coral (*Pocillopora molokaiensis*), Brigham's coral (*Porites brighami*), pohaku puna or compressed coral (*Porites compressa*), thick finger coral (*Porites duerdeni*), pohaku puna or Evermann's coral (*Porites evermanni*, also known as *P. lutea*), *Porites pukoensis* (no common name), and Verrill's lump coral (*Psammocora verrilli*).

The following are the non-endemic stony corals from shallower waters of Hawaii: table coral (*Acropora cytheria*), *Acropora gemmifera* (no common name), finger staghorn coral (*Acropora humilis*), branching staghorn coral (*Acropora nasuta*), fuzzy table coral (*Acropora paniculata*), bushy staghorn coral (*Acropora valida*), *Anacropora sp.* (no common name), oval cup coral (*Balanophyllia sp.*, also called *Cladopsammia eguchii*), Wells' coral (*Coscinaraea wellsii*), fragile mushroom coral (*Cycloseris fragilis*, also called *Diaseris fragilis*), humpback coral (*Cycloseris hexagonalis*, also called *C. vaughani*), ocellated coral (*Cyphastrea ocellina*), distorted mushroom coral (*Diaseris distorta*), granulated mushroom coral (*Fungia granulosa*), mushroom coral (*Fungia scutaria*), *Fungia sp.* (no common name), honeycomb coral (*Gardineroseris planulata*), Bewick's coral (*Leptastrea bewickensis*), *Leptastrea bottae* (no common name, also known as *L. hawaiiensis* and *Cyphastrea agassizi*), spotted coral (*Leptastrea pruinosa*), crust coral (*Leptastrea purpurea*), transverse coral (*Leptastrea transversa*), foliose coral (*Leptoseris foliosa*), swelling coral (*Leptoseris incrustans*), ridge coral (*Leptoseris myctoseroides*), papyrus coral (*Leptoseris papyracea*), rough plate coral (*Leptoseris scabra*), tube coral (*Leptoseris tubulifera*), hidden orange coral (*Madracis pharensis*), *Montipora tuberculosa* (no common name), lumpy rice coral (*Montipora turgescens*), *Pavona pollicata* (no common name, also known as *P. maldivensis*), corrugated coral (*Pavona varians*), Lace coral (*Pocillopora damicornis*), antler coral (*Pocillopora eydouxi*), thin cauliflower coral (*Pocillopora ligulata*), cauliflower coral (*Pocillopora meandrina*), nodule coral (*Porites cf. annae*), false lichen coral (*Porites bernardi*), plate and knob coral (*Porites convexa*, also known as *P. monticulosa*), lichen coral (*Porites lichen*), lobe coral (*Porites lobata*), plate and pillar coral (*Porites rus*, also known as *Porites irregularis*), solid coral (*Porites solida*), deep lobe coral (*Porites studeri*), flat coral (*Psammocora explanulata*), Haime's lump coral (*Psammocora haimeana*), Nierstrasz's coral (*Psammocora nierstraszi*), stellar coral (*Psammocora stellata*), superficial coral (*Psammocora superficialis*), Verrill's lump coral (*Rhizopsammia verrilli*), tiny cup coral (*Tethocyathus minor*), colonial cup coral (*Tubastraea coccinea*), and black cup coral (*Tubastraea diaphana*).

The following are deep water scleratinian corals from Hawaii (none have common names): *Anisopsammia ampeiliodes*, *Anthemiphyllia pacifica*, *Balanophyllia desmophylloides*, *Balanophyllia diomedae*, *Balanophyllia hawaiiensis*, *Balanophyllia laysanensis*, *Bathyactis hawaiiensis*, *Caryophyllia alcocki*, *Caryophyllia octopalli*, *Ceratotrochus laxus*, *Cyathoceras diomedae*, *Deltocyathus andamanicus*, *Dendrophyllia oahensis*, *Desmophyllum cristagallis*, *Endopachys oahensis*, *Flabellum deludens*, *Flabellum pavoninum*, *Gardineria hawaiiensis*, *Madracis kauaiensis*, *Madrepora kauaiensis*, *Paracyathus gardineri*, *Paracyathus mauiensis*, *paracyathus molokensis*, *Paracyathus tenuicalyx*, *Placotrochus fuscus*, *Stephanophyllia formosissima*, and *Trochocyathus oahensis*.

DISTRIBUTION: *A. cytheria* is found in the Northwestern Hawaiian Islands (NWHI) around French Frigate Shoals and a few colonies were identified off Kaua'i, but are no longer there. Fossils show that historically it was widespread throughout the islands. *Acropora gemmifera*, *Acropora humilis*, *Acropora paniculata*, *Acropora valida* and *Montipora turgescens* are known only from the NWHI. *Anacropora* has only been found off Maui. An unnamed *Fungia sp.* has been found off of the island of Hawai'i. *Gardineroseris* is found only from the island of Hawai'i

through O'ahu. *Leptoseris foliosa* is only known from Maui. *Montipora dilitata* is found only within Kane'ōhe Bay. *Porites annae* is known from Maui. *Porites duerdeni* is found only in Kane'ōhe Bay and possibly South Maui. *Porites lichen* is only common near Kure Atoll and O'ahu. *Porites pukoensis* is found only near Moloka'i. *Psammodora verrilli* occurs off O'ahu and Moloka'i only. No reliable distribution data exists for the deep water corals. Distribution of the other species is statewide.

ABUNDANCE: The stony corals are extensively monitored by the Division of Aquatic Resources, National Marine Fisheries Service, and the Coral Reef Assessment and Monitoring Program partnership including the University of Hawaii. All groups maintain data accessible to managers. There is no evidence of widespread decline for any species, though localized declines from habitat alteration, shipwrecks, runoff, and coral bleaching in the NWHI have been documented.

LOCATION AND CONDITION OF KEY HABITAT: Readers should refer to the coral guides below for specific information on the location of key habitat for these corals. *Leptoseris papyracea* and *P. studeri* occurs in water over 30 meters (100 feet) deep. The really deep water corals that occur over 91 meters (300 feet) deep are listed in a special paragraph above.

THREATS: Threats vary in character and severity between the Main Hawaiian Islands (MHI) and the NWHI. Primary threats to the coral reefs of the MHI are the following:

- Pollution such as high levels of nutrients, sediments, and freshwater all negatively impact coral reefs in nearshore areas. Water pollution results from urbanization, stream channelization, paving of coastal and upland roads and inadequate land-use practices;
- Tourism activities can lead to coral damage when tourists trample and walk on the coral and when boats anchor on reefs or spill fuel;
- Alien species such as macroalgae or snowflake coral (*Carijoa*) can quickly dominate coral reef habitat and form floating mats;
- Marine debris gets stuck on coral reefs and can break off large pieces of colonies. Corals also are important to the aquarium trade;
- Taking or harvesting stony corals is prohibited by law; however, they are still removed;
- Marine debris is a threat to coral, especially in the NWHI. The debris, primarily derelict fishing gear, entangles pieces of coral and it scours the reef as it moves around in the waves;
- Climate change may be linked to recent events of coral bleaching in the NWHI in 2002 and 2004;
- Disease is a potential threat in all areas but has not yet caused serious mortality of corals in Hawai'i.

CONSERVATION ACTIONS: The goals of conservation actions are to not only protect current populations, but to also establish further populations to reduce the risk of extinction. Stony corals are protected under Appendix II of the Convention on International Trade in Endangered Species (CITES). Many organizations work to protect coral reefs in Hawai'i through research and conservation such as the Hawaiian Coral Reef Initiative. In addition to common state-wide and island conservation actions, specific actions include:

- Work with partners to minimize nutrient loading and other pollution from land-based sources;

- Increase education and outreach effort, specifically to tourists and tourism programs on the effects of trampling and walking on corals;
- Continue to remove alien species, specifically alien algae using established effective techniques;
- Prevent alien species from entering the ecosystem by preventative measures, education, and rapidly responding to new intruders;
- Enforce existing regulations and educate public on regulations that prohibit the collection and trade of aquarium species;
- Expand on existing MPAs and look for priority areas for new MPAs;
- Restore habitat where feasible;
- Establish rapid response team to deal with shipwrecks, oil spills, disease, hurricanes, and other acute impacts;
- Continue working to remove marine debris.

MONITORING:

- Monitor alien macroalgae and removal operations to determine impacts on coral;
- Implement comprehensive disease monitoring statewide;
- Continue monitoring coral populations and expand to unsurveyed areas such as is being done with the new MHI RAMP cruises in partnership of DAR and NMFS.

RESEARCH PRIORITIES:

- Research the compounded effects of threats such as water pollution, harvesting of coral, and alien species on coral health;
- Continue researching most effective means for removing invasive macroalgae.

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