

Coral Reefs: Devastating Declines from Human Activities

Brittni Latterell

Environmental Studies Department
The College of Saint Benedict/Saint John's University
Faculty Advisors: Dr. Derek Larson and Dr. Troy Knight

Introduction:

Coral reefs are in danger. Since the late 1960s more than 35 million acres of coral reefs have been destroyed by human activity. Current estimates are that 10% of all coral reefs are degraded beyond recovery, and 30% are in critical condition and may die within 10 to 20 years. Millions of people rely on the reefs for many different reasons including income, food, and protection. How can human threats imposed on coral reefs be better understood to reveal a way to protect them for the future? In order to learn how reefs are threatened from direct and indirect human activities, it is significant to know the reefs function in the ecosystem they live in and how they are affected. This is a global issue, the solutions available now are not effective; since the threats are numerous and come from many different activities an Integrated Management Plan (IMP) is necessary to decrease their decline. If solutions are executed separately they will be less effective in the long run than they would be combined and put into a balanced practice.

Methods:

- Initial information is from a literature review of "The Biology of Coral Reefs" by Charles Sheppard (and other books), which include the biology of the corals, how they function, their structure, and where they are located. This provided information as to why the corals are declining from human impacts.
- Threats come from direct human activities (overfishing, destructive fishing, and tourism) and indirect human activities (deforestation, terrestrial run-off, pollution, and coastal development). Nine specific reefs are analyzed by a table to asses the extent of the damage of the threats. The reefs are evaluated on a scale from 1-5, 4 and 5 being the most threatened. The most threatened include the reefs that have a very slim chance of recovering. The scale was designed by researching which reefs are affected by certain threats and how fast they are declining.
- Original research is from a trip to the Bahamas. First hand experience showed how human activities have destroyed corals and how there is no local effort to protect them. One example is when the local fishermen go out to fish they throw their anchors at random. If it gets caught on a coral and rips it up they just throw the anchor back in again.

Acknowledgments: Special thanks to Derek Larson, Troy Knight, Gordon Brown, Larry Davis, The Gerace Research Centre San Salvador, Bahamas and my peers for helping me in the research, writing, and revisions of this project.

Locations of Coral Reefs in the Tropical Zone



Picture 2. Location of reefs, the tropical zone is the region lying between the Tropic of Cancer and Capricorn. The corals survive in this warm water zone, which range from 21°C to 35°C. The trade winds blow all year round, which carry with them warm water. (Source: The Coral Reefss, a blog site, www.thecoralreefss.com/coral-reefs-locations/)

Assessment of Anthropogenic Threats Coral Reefs

Location	Threat Rating	Indirect	Direct
Australia Great Barrier Reef	3	Deforestation Terrestrial run-off (agricultural)	Trawling Overfishing
Mesoamerican	3	Terrestrial run-off Coastal Development Pollution (settlements)	Overfishing
Bahamas	4	Pollution (garbage) Coastal Development Terrestrial run-off	Tourism Destructive fishing
Hawaii	3	Terrestrial run-off (farming)	Overfishing
Indonesia	5	Export and trade Terrestrial run-off Pollution Coastal Development	Overfishing Destructive fishing Tourism
Philippines	3	Terrestrial run-off	Overfishing Destructive fishing
Maldives	1		Tourism
Bermuda	1	Terrestrial run-off (domestic)	
Florida	4	Coastal Development Terrestrial run-off (ag. / sewage)	Grounded vessels Overfishing

Table 1. Information about the magnitude of the decline in coral reefs on a scale from 1 to 5, 4 and 5 being the most threatened from anthropogenic disturbances. It also states which threat is most endangering that specific reef. (Source: Author)



Picture 1. This is healthy coral on an Indonesia reef from 1992. (Source: dsabophoto.com, Dennis Sabo)

Results:

As seen in Table 1 there are many different threats imposed on reefs from human activities. For successful protection an Integrated Management Plan would have to be implemented. The IMP includes long-term plans that will focus on public education, community development, economic incentives, regulation and enforcement of exploitation, management of land-based incentives, and ecotourism. The emphasis on these activities will create a better understanding throughout coastal regions as to why reefs are important. One part of the IMP is to implement No-Take Zones (NTZ) which are areas set aside by the government where no extractive activity is allowed for 5 years. Extractive activity is any action that removes, or extracts, any resource. The 5 years will give the area time to rejuvenate and be able to sustain safe fishing while other areas are put under this protection.

Conclusion:

It is important to protect coral reefs because they are a significant part of how people of the world live their lives. Many people depend on them for survival. The most threatened coral reefs which are indicated by a number 4 or 5 in the table are the reefs that need more attention because they have a smaller chance of being restored. This IMP will be a set standard that every coastal region participating will have to follow. The barriers the current plans are facing are lack of appropriate policies, protection mechanisms, zoning, and infrastructure to support tourism. The more effective, long-term plan will have a balance that will incorporate coral reefs that are declining at an alarming rate. If the IMP is not implemented they may disappear forever; they will continue to decline past the point of preservation.

Unhealthy Coral



Picture 3 (top) is a coral reef after the event of blast fishing which is when a fisherman uses dynamite to bomb and kill fish so they rise to the surface. (Source: www.wri.org, Sue Wells)