
Unit 1 Lesson 5: Reef Protection and Preservation.

Lesson Objectives:

- Students should gain an appreciation for Marine Sanctuaries and Protected Areas and the goals of the National Marine Sanctuary Program.

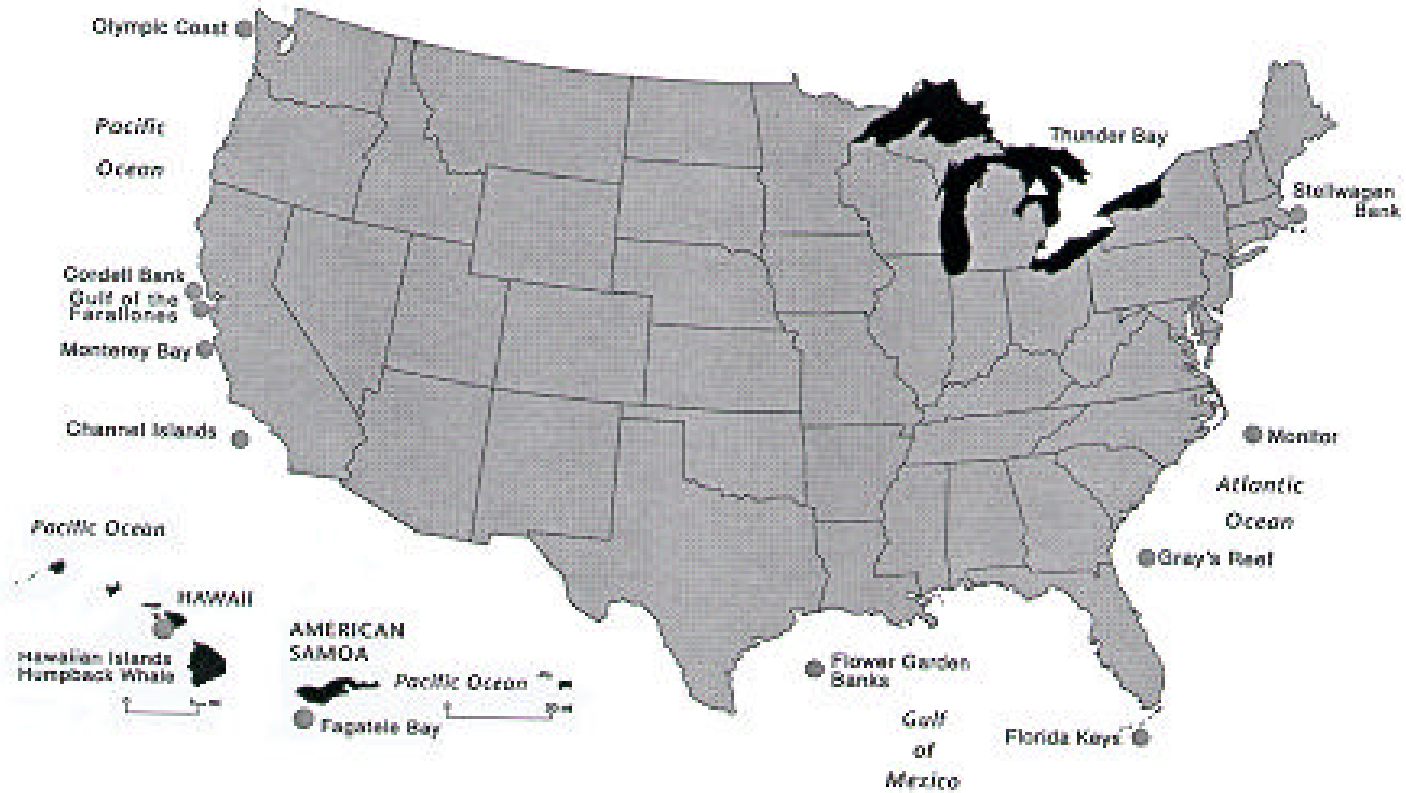
Vocabulary: Sanctuary, ecosystems, larvae, progeny, and carrying capacity

What is the Florida Keys National Marine Sanctuary (FKNMS)?

The National Marine Sanctuaries consist of 12 special underwater regions designated by the Secretary of Commerce under the authority of the Marine Protection, Research and Sanctuaries Act of 1972. This act of Congress defines marine sanctuaries as “areas of special national significance due to their resource or human use values.”

Its purpose is to promote management so as to protect “conservation, recreational, ecological, historical, research, educational, or aesthetic value.” National Marine Sanctuaries are located along U.S. coasts, the Great Lakes, Hawaii and American Samoa. They range in size from one to over 5,300 square miles.

See the map of the National Marine Sanctuaries on the following page.





The word sanctuary is derived from a Latin word meaning “sacred,” and is most often thought of as a place of worship. It has also come to mean “a reserved area in which birds and other animals, especially wild animals, are protected from hunting or molestation.” The word takes on a special meaning in relation to marine sanctuaries, where the wild animals include whales, sea turtles, coral reefs, seals, fish, kelp forests, tide flats, and mangrove

communities. Some of the sanctuaries also protect historical monuments, like shipwrecks, lighthouses, and Native American relicts.

The sanctuary has a different meaning and purpose for each citizen. Recreational divers, fishermen, tourism business people, scientists, and school children all have different interests in how these valuable resources are managed and how activities within their boundaries are regulated.

Each marine sanctuary has its own unique set of habitats, species, and cultural resources. Each must also have its own management strategy to insure protection of the interests of all users for generations to come.

To try and protect this unique marine environment for many years, a **management plan** has been established. There are 10 issues and areas addressed in this plan:

1. Channel/Reef Marking
2. Education and Outreach to the Public
3. Enforcement of Laws
4. Zoning
5. Regulated usage
6. Active researching and monitoring
7. Submerged cultural resources
8. Volunteer action
9. Water Quality improvements
10. Mooring Buoys used for scientific studies



While there is strict regulation of some activities in the FKNMS to protect the resources, multiple uses such

as careful recreation, commercial fishing and responsible shipping are encouraged.

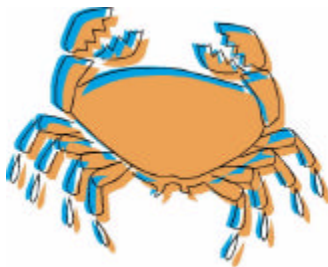
Moving Coral Out of Harms Way

Ship groundings, when ships get stuck in the bottom, are not the only cause for coral reef restoration. Coral reef often find themselves in the way of marine construction projects. Unlike ship groundings, planned projects can plan to move marine organisms to safe locations before they are destroyed. For example, large-scale coral transplants have

been conducted in order to minimize damage to coral reefs from construction of a ship pier in Mexico, a navigation channel in Thailand, and a small boat harbor in Kawaihae Bay, Hawaii. Although the success rates of large-scale coral transplants have varied, transplanting is becoming an important tool in the effort to save coral reefs.

Marine Protected Areas – Marine Sanctuaries

Technological advances in marine electronics make it possible to find fish in all corners of their environment. To curb over-fishing, and



hopefully provide areas where populations of some animals

can rebound, some areas with restrictions on hunting, fishing, and recreational activities have been set aside as protected areas. The idea behind a marine protected area is to provide a refuge of sufficient size to protect the ecological structure and function of reef communities. Regulations and their enforcement enable the ecosystem to rebound, and the **progeny**, or offspring, of reef organisms will eventually



multiple so successfully that the population will surpass the **carrying capacity** of the marine protected area. When populations reach these levels,

animals will move on to colonize other adjacent areas, forming and colonizing new reefs.

Issues of Marine Protected Areas

- Fishermen: They don't want to give up the right to an area they have traditionally fished.
- Divers and snorkelers: Like the idea of having unique areas to visit, although some are unhappy that they can not take home a 'souvenir'.
- Commercial vs. tourism industries: some will favor and some will not
- Marine management: protected areas need a lot of support, energy and care. They need to gain a majority of public support.



For more information and great pictures,
visit: www.fknms.nos.noaa.gov
www.sanctuaries.noaa.gov



Activity 5-1: Grow your own Coral Reef

Background: Now that the students have learned about coral reefs, the environment they live in, what affects them, and their beauty, have the students grow their own reef. It is a fun project, and will give the students some appreciation for the time that it takes for the reef to grow, and that constant care will only keep it thriving.

Materials:

piece of string
water
sugar
toothpicks
small gumdrops or hard candies
food coloring
small container



Method:

1. Make a saturated solution of water and sugar in container, by adding sugar until it will no longer dissolve in the solution. Add food coloring to make it an attractive color.
2. Suspend a piece of string from a short popsicle stick or toothpick over container so the string is suspended through the sugar solution.
3. Leave the string and sugar water for a few days and observe crystals growing up the string.
4. Place gumdrops or other hard candy on the bottom, and allow crystals to form on them.
5. When the solution is gone, mix another sugar water solution of another color. Drop the same string into that solution and allow crystals to 'grow'.

You now have your own "reef!"

