The application processing fee is determined by a number of factors, but typically is about $200.

Note: Depending on the location of the proposed aquaculture site, a permit may also be needed from the U.S. Army Corps of Engineers. If it is, the Department of Environmental Protection may forward the application to the Corps for processing.

For more information concerning aquaculture research contact:

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October 1993 SGEF - 44

LIVE ROCK AQUACULTURE:

A Guide to Getting Started

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A Florida Sea Grant
College Program Publication

INTRODUCTION

Ten million North American aquarium hobbyists spend more than $1.6 billion per year for their tank systems. Among these hobbyists, saltwater tank owners are the fastest growing segment and their demand for organisms which help maintain their delicate aquarium ecosystems is virtually unbounded. The chemical and biological filters necessary to keep such mini-reef systems naturally balanced within a marine aquarium are primarily provided by "live rock" – the term for any rock encrusted with marine organisms.

The many varieties of algae and bacteria which encrust live rock are considered the hardworking "backbone" of support for a mini-reef system. In fact, each gallon of saltwater within a tank requires nearly two pounds of live rock to keep the system filtered and clean.

Live rock is also the habitat for larger invertebrate and plant formations. Anemones, tunicates, urchins, larger algae, fans, and other complex organisms lend aesthetic beauty to the tank and are often more expensive than the simpler algae-encrusted live rocks.

Tank owners typically purchase live rock with both types of growth. This allows them to employ the filtering and cleansing mechanisms of the live rock, while creating the exotic look of an actual reef system.

In the past, the demand for this essential component of a marine aquarium was primarily met by suppliers who collected live rock from state and federal waters off Florida's coast. Unfortunately, the annual removal of 200 or more tons of live rock to meet hobbyists demands was comparable to destroying two complete patch reefs each year. Because of its severe impact on reef habitats, the collection of naturally-occurring live rock is no longer permitted in Florida waters. Instead, only commercially grown live rock may be harvested.

Meeting the expanding needs of the marine aquarium industry has become a challenge for commercial aquaculturists. Fortunately, the natural elements which promote the spontaneous growth of live rock within Florida's coastal waters are also readily available for aquaculture. By applying what they learn about the rich and diverse elements of the Sunshine State's coastal waters, aquaculturists will be able grow and harvest enough live rock to meet the future needs of the marine aquarium industry.

LIVE ROCK AQUACULTURE

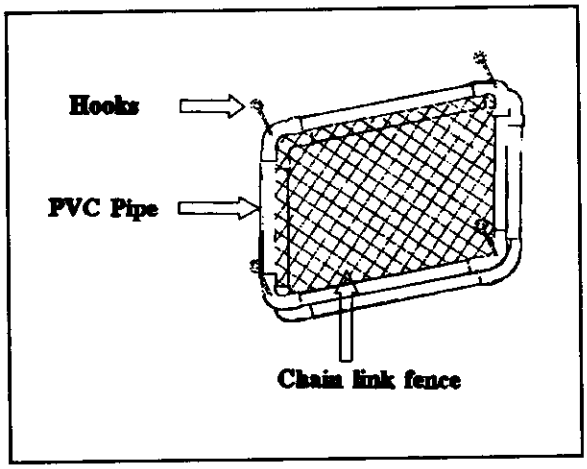
Live rock aquaculture involves placing privately-owned rocks on underwater lands leased from the State of Florida.

Aquaculturists have several types of material to select from for their live rock base. Desirable organisms have been successfully grown on porous calcium carbonate rocks such as limestone and oolite, on fossilized coral, and on the type of concrete rubble used for artificial reef production. In fact, suitable concrete pieces may be widely available at minimal cost or even inexpensively recycled from county landfills. State rules require that rocks used for live rock aquaculture must be readily distinguishable from native rock in the area. Therefore, care should be taken in selecting the proper type of rock.

The size of the seed rock used is limited only by the harvesting technique. Softball-sized substrate rocks are commonly used because they provide ample surface area for colonization without being too difficult to handle.

Reasonably priced platforms for holding the live

rock can be simply constructed out of pvc pipe and chain link fence (see figure) or the rocks may be directly placed on the sea floor. The platforms help distinguish the live rock beds from naturally occurring rock habitats and also protect the rocks from shifting sands and strong currents. In addition, they also allow space around each rock for maximum colonization of the rock surface. Of course, the platforms also make monitoring and retrieving the rocks much easier than it is to work with rocks placed directly on the bottom.



The location of the aquaculture site should be precisely documented by Loran or GPS coordinates. A well-reinforced marker system, both above and below the water line, will help locate the submerged plots. Care must be taken to avoid disturbing existing sea grasses and other natural habitats, as well as to avoid removing any seed rock which has been settled by living hard corals.

Depending on the characteristics of the water, colonization of the rock takes place within three to twelve months. A rotating harvest system may produce two or more live rock harvests per year and provide a continuous supply of standing—yet renewable—habitat for indigenous marine organisms.

Once harvested, live rock must be treated as other ornamental living marine organisms for the tropical aquarium industry—by using proper tank and aeration equipment to transport and distribute the organisms. Because Florida is the hub of North America's tropical fish industry, numerous distribution options exist for both wholesale and retail marketing of the cultured live rock.

CHOOSING A SITE

Perhaps the most important consideration of an aquaculture venture is its site location. Here are some characteristics that make an ideal site for aquaculture:

- Minimal boat traffic - Site should be well outside major boat channels to prevent disruption of boat traffic and disturbance of the aquaculture plot.
- Shallow depth with ample light penetration - Depths of one to three meters allow sufficient light to pass through the photic zone, thereby producing important algal and bacterial growth.
- Absence of strong currents - Strong waves and shifting sands may bury seed rock or prevent colonization from occurring.
- Low turbidity - Clear water with a Secchi disk visibility reading of two or more meters provides the most hospitable environment.
- Minimal sedimentation development - Sand, silt, or other debris may collect on and decrease the surface area of the live rock and prevent full establishment of desired organisms.

- Salinity - An optimal salinity range of 30 to 33 parts per thousand (ppt) is desirable.

Additional location considerations - The knowledgeable aquaculturist may be able to grow specific desirable organisms on live rock by placing the seed rock within conditions and at locations known to produce those organisms.

SUMMARY OF PRINCIPAL RULES

The Florida Marine Fisheries Commission Rules 46-42.008 govern the collection and harvesting of live rock in State waters. "Harvest of live rock in state waters, with the exception of aquacultured live rock from leased submerged state lands, will continue to be prohibited..."

Paragraph 3, Subsection 1 of the above rule allows the harvest and commercial sale of live rock by "any person possessing a Saltwater Products license with a marine life endorsement who is harvesting and landing live rock cultured on state submerged lands leased from the State of Florida." The rock used for such culture must be geologically distinguishable from rock native to the area or be marked or tagged to differentiate the cultured rock from the naturally occurring live rock. Only the lease holder to the lands, or one who is authorized in writing by the leaseholder, may place the rock on the lands.

Additionally, Marine Fisheries Rule 46-42.0035 provides that anyone harvesting any tropical ornamental marine plant or animal life shall land such organisms alive and that the vessel used for collecting and or transporting the organisms shall be equipped with a circulating live well or aeration system sufficient to maintain the harvested organisms in a healthy condition.

STATE RULES CONCERNING SPECIFIC ORGANISMS

Some organisms found on live rock are considered endangered (or restricted) and cannot be legally removed from state and/or federal waters. Collection, damage or sale of stony corals, many soft corals, sea anemones, feather-duster worms, and many other species is prohibited under Chapter 370.114 Florida statutes. A complete listing of species that cannot be legally collected may be obtained from the Department of Environmental Protection. A list of species excluded from collection is also provided with each saltwater products license.

LICENSES AND PERMITS

To grow and harvest live rock from Florida's coastal waters, an aquaculturist must obtain both a Saltwater Products License and a lease for the submerged lands where the live rock is to be grown.

For an application for a Saltwater Products license, with a Marine Life endorsement, write to:

The Department of Environmental Protection
Saltwater Licenses and Permits Section,
MS 655
3900 Commonwealth Boulevard
Tallahassee, FL 32399

For information on applying for a lease for live rock aquaculture on submerged state lands, write to:

The Department of Environmental Protection
Division of State Lands
Submerged Lands Section
3900 Commonwealth Boulevard
Tallahassee, FL 32399