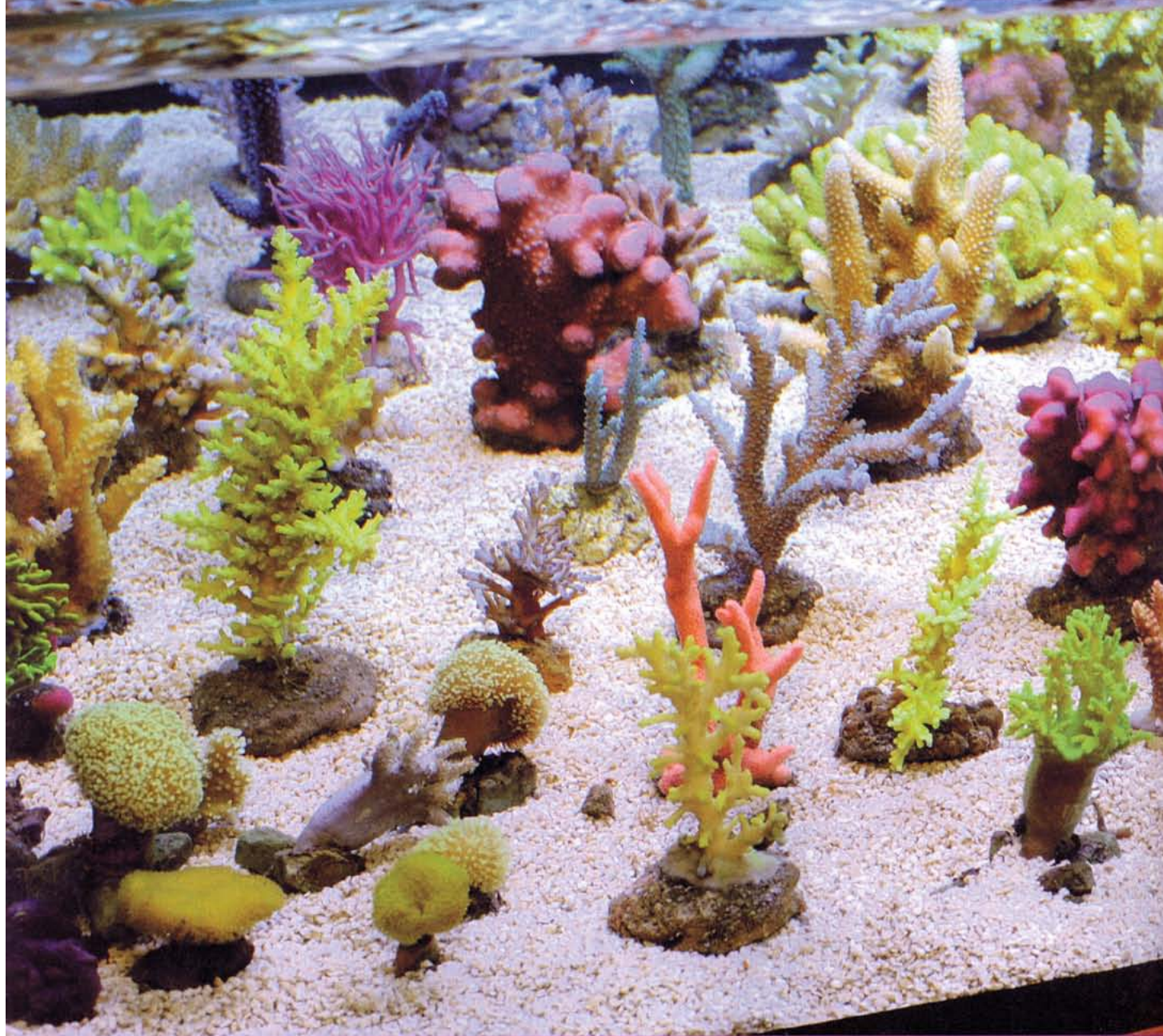


Doing The Impossible





Reefkeeping has seen various technological improvements, but the most exciting parts may be yet to come.

BY PATRICIA KNIGHT

Since reefkeeping became a reality, reef aquarists have been very aware and very passionate about their hobby. If we look at the reef hobby over the last 15 years, it has seen various changes, from more energy-efficient methodologies to new technology in general. Fifteen years ago, people were keeping clams and using plenums, just as they do now — but they lacked the benefit of LED lighting, for example.

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Fragging helps to make more corals available and preserves wild corals.

Today, it's obvious that reef hobbyists' awareness and passion have led to (among other things) more nano tanks and fragging, though the aforementioned LEDs are probably the most obvious technical advancement. LEDs offer enough light to keep reef inverts without putting out a bunch of heat, and they are energy-efficient. And there is no doubt that more efficient skimmers and other equipment have improved the hobby greatly. Skimmers themselves, like most equipment, actually started in reef aquaria many years ago.

Interestingly, when asked about the strides and advancements made in the reef hobby for the past 15 years, many experts place the most importance on the animals that they can now keep and hopes for a more sustainable hobby in the future. Also, though reefkeeping is a growing segment of the hobby, more fellow reef aquarists to participate also makes the list.

Success With Challenging Animals

A lot of animals once thought to be too difficult to keep in captivity are now a possibility for aquarists. With many animals, nutrition has been the pivotal factor. Scott Michael, photojournalist and aquarium service technician, cites anthias and zooplanktivores that were once thought of as difficult to keep.

"There are better foods for these fishes on the market, and we now are trying harder to feed them more often, i.e., mimic their natural feeding patterns." He also notes inoculating aquariums with live microcrus-

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The Toledo Zoo breeds boarfish. This one is 12 days post-hatch.

COURTESY OF JAY HEMDAL

Although patience is a virtue, it is not everyone's forte — and with reefkeeping, it needs to be.



The Internet is both good and bad because the information found on it might be reliable, or it might not. Aquarists beware!

taceans, which can help aquarists succeed with some of the challenging fishes.

In addition, captive-rearing has helped make animals available that are used to eating prepared foods. Steven Pro, president of MASNA (the Marine Aquarium Societies of North America), is now considering keeping a Mandarinfish in a nano, due to the captive-reared individuals that will accept prepared foods. "In the past, I would have never considered it," he said, "as one used to need a large, mature reef tank teeming with live food."

Moon jellies are another example of previously impossible-to-keep animals. Although these animals are not for beginners, home aquarists with a kriesel tank can attempt these translucent inverts. In cases like this, it has more to do with the types of systems available for housing the animals, or for an aquarist to have the right tools to create the necessary system.

"The entire system that I keep would have been unthinkable 15 years ago," said Steve Bitter, senior biologist at the Florida Aquarium in Tampa, Fla. "A small

reef tank such as the 30 gallon that I maintain was considered much too small for housing a reef aquarium, let alone one with light and flow-demanding corals."

The Future Of Fragging

Fragging obviously makes sense. Nearly all reef aquarists are familiar now with the idea of taking pieces of coral off a colony to grow on their own, thus propagating more corals. Not only does fragging take pressure off of wild corals, but the frags are less expensive and therefore more accessible to more reefkeepers. Jay Hemdal, curator of fishes and invertebrates at the Toledo Zoo, said that getting all soft and SPS corals as frags is perfectly feasible.

The future of fragging is promising, but it looks like not all corals will be available as fragments, unfortunately. Though fragging seems practical overall, there are some corals that grow too slowly, such as LPS corals (e.g., *Trachyphyllia*). "While these can be fragmented, they grow so slow as to not make it a viable business or produce sufficient quantities for the current demand," Pro said.



The Mandarinfish (*Synchiropus splendidus*) is one of the animals that aquarists can now consider keeping thanks to advances in the hobby.

When it comes to coral reproduction, other than fragging, there's also the possibility of sexual reproduction, which Bitter finds promising. This would offer more animals from each parent colony, according to Bitter.

"We're a long way off from that reality," he said. "However, as reefs around the world continue to decline, future regulations and supply pressures will make it more challenging to get the corals we love from wild sources."

Like all improvements, change comes slowly. Maybe reefkeepers cannot expect to get all their future corals as frags, but the hobby is making a difference toward keeping the wild reefs intact, a trend that will surely continue.

Aiming For More Aquaculture

Aquaculture has definitely made great strides in recent years. It is not only possible to get captive-raised clownfishes now but also some species of dottyback, angelfishes, seahorses, tangs and more. Even captive-raised pinnatus batfish (*Platax pinnatus*) have appeared. As with the coral situation, there's still a long way to go before the majority of fish are aquacultured.

The problem is not really with spawning the fish (most of the time) — it's with rearing them. It all comes down to nutrition again. For example, Pro said that a good number of fish have actually bred in captivity. "But not nearly enough have been reared," he added. "We are going to need a breakthrough in the culturing of the foods for rearing the larvae of many marine fish."

Still, Pro is optimistic. "A new specimen is successfully reared in captivity every few months. The number of people working on these issues has certainly sped up the development of breeding techniques."

At the same time, Hemdal doubts that more than 30 percent of fish in the trade will be aquacultured. Again, the main concern for now is to take less because of wild stocks and possible looming government regulations.

Information: The Good & The Bad

Many experts and concerned hobbyists seem to agree that the most positive change in the last 15 years has been the Internet.

And when asked about the most negative change, the same people tend to say "probably the Internet." That's because for the reef hobby, the Internet truly is a double-edged sword — and it's not all just about valid information versus misinformation.

Trading animals with others — all the way across the country — is a big benefit, as Jeremy Beavin, who is an interpretive naturalist, as well as a past president of the Louisville Marine Aquarium Society, points out. "The bad part is this has also created more artificial demand for corals and caused an artificial increase in value." He mentions specifically the "designer" names of corals, pointing out that people may look at corals as knick-knacks rather than animals.

As mentioned, the Internet can lead to not only valid information but also misinformation. Hemdal said that his input for this article was "reviewed by at least five people: the author, the magazine editor and three senior staff [members] at the Toledo Zoo. ... The same material could have reached the Internet and forums with no oversight at all."

The problem also lies in the way the information is used. Bitter is a professional aquarist and does find the Internet useful, but he also mentions a caveat, especially with beginners who want immediate, clear-cut answers. "As experienced aquarists know, reef animals and aquarium systems can act unpredictably. This can make it difficult for new hobbyists to get a clear answer, and unfortunately we tend to seek out opinions that support what we wanted to do already."



Successful captive-breeding is now making more species available to aquarists.

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Challenges For Aquarists

Technology has come a long way, so a lot of the challenges reefkeepers seem to face now are actually about good practices. In light of the misinformation floating around online, a lot of people try and fail early on. "There is still a rather large turnover of hobbyists that get into and then out of aquariumkeeping in a year or less," Pro said.

Beavin agrees and offers a great suggestion for hobbyists. "It can be very difficult to know if the expert on the other end of the Internet is an expert or not. An easy way for a new hobbyist to overcome this is to find a local fish club."

Another challenge has to do with lack of patience. Although patience is a virtue, it is not everyone's forte — and with reefkeeping, it needs to be. All experts constantly advise researching before purchasing, and with good reason. For example, finding out an animal can nuke a tank with chemicals when it dies (e.g., sea apples) is catastrophic if you purchase it and unknowingly put it in with animals you could not bear to lose. Have the patience to research and understand before forging ahead. "The best equipment in the world will not perform up to task if you do not understand the biology in the tank," Beavin said.

Patience is also key when waiting for your tank to grow into the perfect reef you pictured in your mind. "Once you've seen a beautiful, mature and grown-in reef tank, you can't wait to create that same thing, and you want it quickly," Bitter said. "I think the solution is having a plan and knowing what it takes to accomplish that."

Challenges For The Whole Hobby

All this brings up the question of where the hobby is going and how to make it stronger. Accountability may prove crucial. Stores should be aware of what they sell and not offer animals that are likely to die. Luckily, a



Getting more people interested in the hobby, including children, will help it grow.

INGRAM PUBLISHING/THINKSTOCK

Looking Out For The Cleaning Crews

Corals are being fragged. Fish and clams are being aquacultured. Even some anemones are being propagated. There's one group of animals being taken from the wild, however, that do not seem to get much attention: cleaner animals.

Jay Hemdal, curator of fishes and Invertebrates at the Toledo Zoo, is concerned about this group being overharvested in the wild. "These low-value animals are not economically feasible to propagate yet are harvested from the wild in great numbers. Their removal poses an unknown, but probably understated, risk to the health of reefs."

This is a very valid concern. A Plos One paper titled "Crawling to Collapse: Ecologically Unsound Ornamental Invertebrate Fisheries" by Andrew Rhyne, et al., published the discovery that 6 million animals collected in 2007 were grazers, and that was out of a total of 9 million.

As another example, urchins are sometimes suggested as a clean-up animal. Losing urchins from the coral reefs can have a devastating impact, as was seen



Shrimp like *Lysmata grabhami* and other cleaning animals are being harvested from the wild in great numbers.

AL CASTRO

in 1983 when *Diadema antillarum* were nearly extinct due to a massive die-off. From the Caribbean to Bermuda, these urchins were dying, and the reefs that they once cleaned of macroalgae suffered dearly, with the algae choking the corals of light — algae that would have been consumed by *D. antillarum* under normal conditions.

lot of retailers are already doing the right thing.

To help sustain the hobby, Michael mentions the importance of "more fish stores that are selective about what they sell and stick with the proven winners ... and avoid those that are near impossible — or at least extremely difficult." He said he understands both wholesalers and retailers need to make a living, but he believes that they should do it ethically as much as possible.

Pro would like to see more branding of maricultured animals. "So long as more animals remain brandless, bad practices will continue." He gives the example of how branding can benefit a good mariculture company: If a company pretreats their maricultured corals for pests and puts some of their corals back onto wild reefs for restoration, as well as having good shipping and mortality rates — and all this were somehow conveyed to the reefkeepers — there would be reasons for consumers to buy animals from that particular company.

Interest in the hobby could also use a boost. Fifteen years ago, more people were interested in keeping fish in general. Today, reefkeepers, experts, clubs and others in the industry agree that the interest is not what it used to be. At the same time, Hemdal said that as a subset of the aquarium hobby, reefkeeping has been growing.

A related issue that many are concerned about is lack of new, young hobbyists. "Technology — com-

puters, Internet, *Angry Birds* — is one of the biggest draws [competing] for potential young aquarists," Michael said. "Clubs, books, good web content are all ways that may tweak people's interest. The recent shows on aquarium installation and service companies — e.g., *Tanked*, *Fish Tank Kings* — have increased interest somewhat."

Where The Hobby Is Headed

The bottom line is that reefkeeping is a multi-faceted hobby. Everything from minute planktonic foods to the state of coral reefs as a whole has affected it, and will continue to do so. The hobby, though, is moving toward sustainability with fragging and aquaculture, and more awareness in general.

Fifteen years ago, reefkeepers could not have kept moon jellies and Mandarinfish — now they can. Like reef tanks, the hobby itself can be unpredictable. Wherever the reef hobby does end up, one thing is clear: Reefkeepers seem to be taking steps in the right direction. Let's just hope that more people join the journey along the way. 🐟

To learn more about laws on collecting aquarium animals from the wild, go to FishChannel.com/ReefKeepingLaws and FishChannel.com/ReefKeepingLaws2