


Marinelife Dealer

AMDA News - Spring 1997

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WINTER 1996 INDUSTRY PRACTICES SURVEY RESULTS

Last winter, AMDA members were asked to respond to a survey about industry practices and the proposed Marine Aquarium Council (MAC). Thanks to everyone who participated. Here, as promised, are the survey's results, in a report that was presented to the MAC working group:

Introduction

For approximately two years, a group of individuals representing the marine aquarium trade, conservation organizations, and public aquariums have examined ways to address sustainability of current practices for exploitation of coral reef resources by the marine aquarium industry. From these discussions has emerged a proposal to establish a Marine Aquarium Fish Council (MAC). The MAC would be an industry-independent body that would establish standards, oversee certification of marine specimens and facilities, and carry out conservation education. Actual certification would be undertaken by independent, accredited institutions that would apply standards developed by the MAC. Standards, which would be amended periodically as needed, would address collection methods, aquarium-adaptable and non-adaptable species, size limits, transportation methods, holding and handling techniques, and other standards of practice. A nationally recognized name and logo would be created to assist consumers in identifying certified specimens and facilities.

The MAC working group has contracted with aquarium industry consultant John H. Tullock to study businesses trading in tropical marine fish for aquariums in the United States. The purpose of these investigations was to field test the MAC's draft guidelines and to provide additional recommendations regarding standards that can be realistically achieved and economically substantiated.

Wholesalers and retailers from locations throughout the U.S. participated. Interviewees were asked to provide information on physical plant specifications, husbandry practices, and other aspects of their operations that are germane to the goal of benchmark-setting envisioned by the MAC working group.

Methods

The survey questionnaire is divided into 6 sections, each of which sought information regarding a different aspect of the practices associated with obtaining and maintaining inventories of marine fish for aquariums. The section topics are: Species, Sourcing, Physical Plant, Husbandry, Other Information, and Statistical Data. Respondents were advised that all information about individual businesses would be kept strictly confidential. Accordingly, no responding business is identified in this report, and no information about any individual business is presented.

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Welcome to Our First Board of Directors

Congratulations and welcome to the following people who will serve as the AMDA Board of Directors for the next two years.

- Teresa Herndon, of Sea Critters, Dover, Florida
- Lynne Laurita, of Aqua Trends, Laguna Beach, California
- Rick Oellers, of Aquatic Concepts, Westbrook, Maine
- Lance and Mikki Ichinotsubo, of Rainbow Seascapes, Las Vegas, Nevada

This panel of fine people will do much to move AMDA forward during these critical, formative years of its existence.

The first priority for Board meetings has been the development of the AMDA skills recognition program. We envision this as consisting of several components, including a study guide and one or more examinations. Diplomas would be awarded to individuals who achieve a passing score on exams at two levels, one for business owner/operator/manager positions, and one for staff positions. We would like to hear from any and all members concerning the content of this examination, the degree to which experience should be considered in awarding the diploma, and any related topic. Send your comments, suggestions for questions, and any other pertinent information to Mikki Ichinotsubo, Rainbow Seascapes, 5040 Spring Mountain Road #1, Las Vegas, NV 89102

Terms of the new Board members officially began

Respondents were requested to provide answers reflecting only the marine fish portion of their businesses, and not to include any information regarding invertebrates, plants, live rock, live sand, or other live marine products.

To facilitate the efforts of Scientific Certification Systems, many survey questions focused upon the extent to which respondents maintain records pertinent to the sourcing and survivability of their live marine fish inventories. It was also considered important to gather information about respondents' attitudes toward the proposed MAC guidelines. Respondents were also asked about their willingness to participate in the certification process, as envisioned by the MAC.

Results

Sixty-four percent of the businesses responding to the survey described themselves as "retail only." Seven percent were "wholesale only," eight percent maintain aquariums only, and the remaining 21% engage in both wholesale and retail sales. Among retailers, 99% sell only aquariums (67% marine only, 32% both marine and freshwater), and only 1% operate a full-line pet shop. These percentages are thought to reasonably reflect the aquarium industry as a whole.

According to the annual survey of independent pet retailers conducted by *Pet Dealer*, annual pet supplies and livestock sales in the United States in 1995 totaled \$5.16 billion. The survey found that the average gross sales per store was \$431,000. The number of pet stores can thus be calculated at approximately 12,000. Of these, 62%, or 7,440 stores, were found by *Pet Dealer* to be full line stores. It is reasonable to assume that half of these carry marine fish, or 3,720 stores. Only 2% of shops are aquarium only, or 240 stores, although probably most of these specialists carry marine fish. (Competition has forced smaller stores to specialize in the more lucrative marine aquarium niche, since both large independent and chain retailers can compete strongly for freshwater fish sales, owing to their higher traffic, and consequently greater volume of freshwater aquarium sales. Estimates from those familiar with the industry have traditionally placed the marine aquarium market at only about 10% of the total aquarium market. This is consistent with the findings of the American Pet Products Manufacturers Association that, in 1996, there were 1 million households in the United States with a saltwater aquarium, and about 9 million households with a freshwater aquarium.) A reasonable estimate is 200 marine-only shops. Therefore the total number of establishments carrying marine livestock would be about 4,000 or fewer.

More precise data on the industry can be had by looking at inventory category contribution to total revenues. The *Pet Dealer* survey found 2% of total revenues was from marine livestock, or \$103.2 million. This translates to about 10 million individual specimens sold, at an average retail price of \$10. Dividing by 4,000 stores as estimated above, yields about 2,500 specimens per year per store, which agrees closely with data from the present survey. In this survey, the average number of specimens per retailer was about 2,950.

Species. The mean number of species of marine fish sold was 165. The range of responses, however, was large, from a low of only 12 species to over 500. Since the median number of species sold, 150, is close to the mean, however, it is reasonable to assume that the number of species that will come under the scrutiny of the MAC is in this range. This is clearly a manageable number, and reflects only about 25% of the fish species

as of April 1, 1997. (Election to be held again in December, 1998, with new Board to take office April 1, 1999.)

DIRECTORY LISTINGS EXPANDED

The AMDA Membership Directory will be distributed this year at the MACNA Conference in Chicago, provided that enough members comply with our request to supply a brief explanation of your business. The text is limited to 200 words, but we will edit for you, within reason. This is a great opportunity to tell hobbyists about your business philosophy and what sets you apart. The information will also be included in your listing on the AMDA web site. Therefore, please submit your write-up to the AMDA office by August 1, 1997. You may send it postal, fax or email.

House Subcommittee Hears Testimony

The U.S. House heard testimony on HR 87, which condemns harmful coral reef fisheries, on May 6. Dr. Peter Rubec, President of International Marinelife Alliance - USA, expressed support for efforts such as AMDA, TAG and the MAC, in his presentation to the subcommittee. Other witnesses echoed Rubec's comments in support of sustainable harvest of reef resources, monitoring, conservation and wise management as alternatives to either the continuation of destructive practices or restrictions on the trade. The Subcommittee on Fisheries Conservation, Wildlife and Oceans of the Committee on Resources is chaired by Congressman Jim Saxton (R-NJ).

It's True - A Nudibranch that Eats *Aiptasia*

A small, brown nudibranch, *Bergghia verrucicornis*, feeds exclusively on those pesky *Aiptasia* anemones. First mentioned in the scientific literature, the nudibranch was immediately recognized by Bill Hoffman of the Smithsonian Institution as a boon to aquarium keepers everywhere. He sent some to J.R. Shute of Aquatic Specialists, along with instructions for their cultivation. It is probable, J.R. reports, that the nudibranch could be established in an aquarium system prone to *Aiptasia* infestations. The mollusk has proven time-consuming to culture, however. The major problem seems to be having enough tiny *Aiptasia* on hand to feed newly hatched nudibranchs. The time required to maintain cultures is considerable. Aquatic Specialists has provided specimens to several aquaculture businesses, in the hope that this helpful organism can become commercially widespread. Please note that not enough specimens are available to offer them for sale.

TAKING OUR NAME IN VAIN

The AMDA office received several comments concerning a book review that appeared in the April issue of *Freshwater and Marine Aquarium*. The book was *A Practical Guide to Corals for the Reef Aquarium* by Ed Puterbaugh and Eric Borneman. The reviewer stated that AMDA members had voted to adopt this book as our nomenclature standard reference at the Kansas City meeting. Since no such vote was taken, we did some research to find out where this

presently known to occur on coral reefs.

Ninety-two percent of respondents maintain inventory records, although only 50% keep track of the number of individual specimens they handle each year. Sixty-four percent use a computer to maintain inventory records.

The survey defined "eco-labeling" as follows:

"Eco-labeling" is a term that has been coined to describe a system for ranking marine fish according to their relative adaptability to the aquarium. For example, the blue damselfish (*Chrysiptera cyanea*) might be ranked as "very adaptable" or "suitable for beginners," while the ornate butterflyfish (*Chaetodon ornatissimus*), which feeds only on certain species of coral polyps, might be ranked as "unadaptable" or "not suitable for home aquariums."

When asked if some form of eco-labeling was practiced, 79% said "yes." However, of those, fewer than one-third said they had a formal system. Many said they relied on verbal communication with individual customers, and only 14% use the eco-labeling list developed by AMDA. This may be due to dealer's reluctance to define a given species as "difficult" or "unsuitable." (See additional discussion.)

Sourcing. The survey defined "sustainable collection technique" as follows:

"A sustainable collection technique is one which a) does not cause physical damage to the reef environment, b) does not impair the captured specimen's longevity in a properly maintained aquarium environment, and c) does not damage non-target species such as coral polyps, other invertebrates, or non-aquarium fish."

Respondents clearly do not consider the use of chemical anesthetics to collect fish a sustainable technique. Only 14% were willing to allow the use of one chemical product, quinaldine; the remainder did not consider any chemical use acceptable.

Techniques, other than hand nets, that were considered acceptable were: trapping (71%), barrier nets (64%), tickle sticks (43%) and hook and line (29%). Dynamite, as expected, was unanimously considered unacceptable. The acceptance of trapping as a technique is interesting, as several professional collectors interviewed in the course of this research do not regard fish traps as a satisfactory way to harvest aquarium specimens. They cite damage that occurs when the trapped fish struggle to escape or attack each other (since traps are indiscriminate as to species) or are attacked by other species, such as lobsters, that may be attracted to the bait.

Sixty-four percent of respondents say that they stock only specimens that have been harvested by sustainable practices. When asked how they know this, however, they are less confident. Most retailers say they have developed a long-term relationship with a supplier that consistently provides healthy stock, or that they simply rely on the wholesaler's statements that the specimens were harvested properly. A few deal directly with collectors whom they trust, and with whom they have long term experience. As expected, the majority of wholesalers say the reputation of the collectors with whom they work is the basis for their confidence in the quality of the specimens. Thirty-six percent of respondents, however, admitted that information about the methods of collection and handling of the specimens they stock is unavailable to them. Respondents were then asked to assume

information originated. Apparently, the publisher, Ed Puterbaugh, had included this claim in his promotion of the book, due to a misunderstanding. *FAMA* is planning to publish a correction, and AMDA has received a note from Mr. Puterbaugh expressing his apologies. His current mailings to distributors also include a statement that the mention of AMDA in connection with this book was in error.

One concern raised by this situation is that AMDA cannot put itself in the position of endorsing or reviewing products. This is not our function.

Any use of the AMDA name or logo, or any claim of AMDA endorsement or certification, may only be done with permission in writing from the AMDA office. The only exception is that voting members may display the AMDA logo on their advertising materials, or in their place of business.

Medical Insurance Poll

We would like to hear from all members concerning potential interest in purchasing health insurance for members, their families, and their employees at special rates. This is only an exploratory poll, and there is no obligation. If interest warrants, we will seek out several proposals from insurers. Let us hear from you!

OPINION: Captive Propagation Needs Industry Support

One of the marine aquarium industry's most exciting aspects is not receiving the support it deserves from business owners. At a time when more and more species of marine fish, and especially invertebrates, are being added to the roster of captive-propagated specimens, many businesses involved in the production of organisms for home hobbyists report tough financial times. There are undoubtedly many factors at play in determining the ultimate financial success or failure of any business, but the most commonly cited problems for the fledgling industry seem to be: 1) competition with imported wild-caught stock; 2) technical obstacles; 3) risks to potential investors. In a series of articles that have appeared in *Pet Product News* over the past several months (December 1996, February 1997, May 1997, June 1997), I have presented some of the many positive aspects of the captive propagation industry to an audience consisting primarily of pet retailers. The high demand for captive-propagated stock among AMDA members contrasts with low demand among the hobby/industry generally, or so it appears from the reports that have reached my desk.

Yet, evidence of the benefits to the industry that are to be derived from having a thriving captive-propagation industry along with wild harvest via sustainable techniques continues to accumulate. A report by Leonard G.L. Young of the University of Hawaii at Manoa, entitled *Sustainability Issues for the Trade in Wild and Cultured Aquarium Species*, provided to me in draft form (the article is currently in press) predicts an "increase in demand for finfish" for marine aquariums, "with the majority of the trade species being taken from the wild, and the slow introduction of cultured, high-priced ornamentals." However, with the help of accountant Dave Reid, in *Pet Product News* (December, 1996) I demonstrate how cost savings in freight and mortalities can make the real cost of captive propagated stock much less

that information about collecting techniques and handling were available to them in reliable form. Under this scenario, 71% said they would stock only species collected by sustainable techniques.

The primary sources of marine fish are individual collectors, transshippers, wholesalers, and hatcheries. Ninety-three percent of the retailers surveyed obtain fish from wholesalers, and half obtain 90% or more of their stock from this source. Only 36% use the services of transshippers, and they obtain about 14% of their stock from this source. Half the respondents buy directly from the collector. Hatchery-raised fish are included in the inventories of 64% of respondents, although this source contributes only 10% of total inventory of marine fish. Among wholesalers, most deal directly with collectors, as expected, or with exporters representing several collectors.

Many respondents commented on the necessity for experience with specimens from a particular collector, or with a wholesaler's "track record."

Seventy-nine percent of respondents said that incoming fish are tracked in some way to allow for an evaluation of their subsequent performance in captivity, and 86% indicated that they have some standard by which they can determine when a fish in inventory is ready to be sold. When asked about the specifics of their approach, however, most said their system is informal.

An ability to provide important information about an individual fish to a customer was characteristic of virtually all respondents. Ninety-three percent reported that they could inform a customer how long a given specimen had been in inventory and its feeding behavior in the aquarium during that time, and 79% said they could state from which country the specimen originated.

Respondents indicated, by an 86% majority, that they have a definite standard for determining when a particular specimen is ready for sale. However, their comments indicate that this policy is not formalized, and respondents appear to disagree as to the nature of the standard applied. (See Discussion section.)

Physical Plant. Retail businesses responding to the survey report an average of 1,785 gallons of holding space for marine fish, while the average size for wholesale facilities was 7,200 gallons. This information, taken together with estimates of the number of specimens handled per year, suggests that wholesale facilities tend to be significantly more crowded than retail ones. Further, only 57% of respondents report maintaining separate hospital facilities for sick or injured specimens. These data suggest a potential approach to further investigation of appropriate husbandry practices.

Data were collected regarding the filtration systems in use in holding facilities, the water quality parameters maintained by respondents, and the frequency and cure rate of diseases. These data are summarized in Tables 1, 2 and 3, respectively.

TABLE 1 - Filtration Systems in Use by Marine Fish Dealers

	all tanks	only for certain species,	not used

than that of wild-harvested counterparts.

Additional benefits, apart from cost savings, accrue to the industry from captive propagation efforts. Significant financial investment in research and development of husbandry techniques and associated technology provides trickle-down benefits to the industry at all levels. In developing countries, the evolution of aquaculture industries, often with technical assistance from consumer nations like the United States, the European Economic Community, and Japan, results not only in new economic development and job creation for people who badly need it, but also may help to focus local attention on the importance of maintaining coastal resources in the high state of health that successful "farming" of the lagoon requires.

Moreover, both wild-harvest and captive-propagation "are heavily dependent upon the natural populations....," as Young points out, for specimens, broodstock, and genetic diversity. Thus, every facet of this industry is a stakeholder in the effort to maintain healthy, undamaged coral reefs as a renewable, sustainable source of ornamental marine organisms. This point bears emphasis, because there is a legitimate counterpoint raised by honorable individuals within the industry who state that the existence of a thriving captive-propagation industry for aquarium ornamentals will result in reduced concern for the conservation of natural reefs as refugia for the species being cultured. To the proponents of this view I can only suggest that they fail to grasp the comparison in scope between what can be accomplished by a hatchery versus what can be accomplished by a healthy reef, in terms of productivity of specimens. By any measure, the marine aquarium industry removes a miniscule fraction of the biological wealth that a reef can produce. Removal of food fish, for example, and the mining of coral and coral rock for use in construction, are larger industries than aquarium collecting, by several orders of magnitude. A fish hatchery can produce, say, a million clownfish per year. A reef might produce that many fish in a single spawning event. Assume for a moment that the population density of clownfish is one spawning pair per 100 square meters; there would be 100 pairs per hectare (a small patch reef) each producing an average of 500 eggs per spawn, or 50,000 fertile eggs per hectare. There are 62 million hectares of coral reef habitat, and 200 million hectares of lagoon-type habitat where clownfish might be found, with the majority of these reefs located within the geographic range of clownfish. The productivity for just this small group of species is mind-boggling. If the clownfish are limited to only 50 million hectares of suitable habitat, let us further assume, then each spawning event will produce around 2.5 trillion larval fishes. Clownfish spawn throughout the year, approximately once a month.

Captive propagation also holds out the potential for restoration of depleted natural populations, as numerous examples from the freshwater realm clearly show. There have been some tentative efforts at restoration of damaged reefs via transplantation of corals propagated from fragments removed to the laboratory.

The existence, therefore, of a successful captive propagation component within our industry should be encouraged.

OPINION: Quinaldine Article Response

We received the following letter in response to the

Pumped water circulation	86%	14%,	0%
Sparging	7%	7%	86%
Mechanical filtration:	77%,	15%	8%
Undergravel filter	0%	15%	85%
Sump biological filter	31%	46%,	23%
Fluidized bed	15%	23%	62%
Activated carbon	15%	54%	31%
Chemical resins	15%	15%	70%
Protein skimming	69%	23%	8%
Open system	8%	0%	92%

TABLE 2 - Water Quality Parameters in Holding Facilities

Parameter	Average Reading	Range
Temperature (°F)	74.4	75 - 84
pH	8.22	8.0 - 8.3
Ammonia (NH4+), ppm	0	0
Nitrite (NO2-), ppm	0	0
Nitrate (NO3-), ppm ion	18	<10 50
Specific Gravity	1.021	1.018 - 1.025
Dissolved Oxygen (O2), mg/l	7	6 - 8
Alkalinity, meq/l	3.9	2.8 - 7.0

TABLE 3a - Frequency of Common Marine Fish Problems

	more often than once a month	3-6 times per year	<3 times per year
injuries to the fins, scales or skin	64%	27%,	9%
injuries to the eye	27%	64%	9%
cryptocaryon or amyloodinium infestation	45%	45%,	10%
hemorrhagic septicemia	18%,	55%,	27%
deep wounds	0%	55%	45%
head and lateral line erosion (hlle)	10%,	45%,	45%
starvation, wasting:	36%	36%	28%
lymphocystis:	45%,	27%,	28%
black spot infestation in surgeonfishes	18%,	18%	64%
unexplained death	45%	45%	10%

TABLE 3b - Cure Rates for Common Marine Fish Problems

	almost always	about 50/50	seldom, if ever
injuries to the fins, scales or skin	73%	27%	0%

article by Teresa Herndon about quinaldine that appeared in the last issue.

February 27, 1997
 To: Roy and Teresa Herndon
 Copy To: John Tullock

Dear Roy and Teresa:

Thanks for your article concerning quinaldine that was recently published in the AMDA newsletter. It has helped me to appreciate the issue from the perspective of the collector, the one who's actually out there, swimming with the sharks and harvesting the fish and invertebrates that the rest of us get to sell. I hope my response here will help you to see the point of view of at least one dealer, 1000 miles from the nearest ocean, but just as interested in providing a good product.

I should point out at this point that, to my knowledge, I have never received fish that you have collected, either directly or through a wholesaler, so my concerns are not directed at you personally.

My first concern regarding quinaldine is partly one of semantics. If some of the fish I sell are likely to have been caught with this chemical, I cannot in good conscience use terms like "Drug-Free" or "Net-Caught" when referring to my stock. I know I could explain to each customer that quinaldine is not known to damage fish or the environment. But unless you and I can convince the customer that collection via quinaldine actually benefits him, the fish or the environment (rather than just you or me), it's not exactly a selling point.

I'm also somewhat concerned with the studies done on quinaldine. Do any of the references you cited deal with long-term effects on fish collected with quinaldine, as opposed to short term effects or fish exposed in a more controlled environment? And the fact that they - and you - suggest further study to determine environmental impact doesn't help to make a case for it's continued use.

But my biggest concern is one of my own observation: my success rate with Atlantic fish (where I'm told quinaldine use is commonplace) doesn't meet my expectations. D.O.A.s are too common, angels too often get lymphocystis, butterflies too often get cloudy eyes or skin, and way too many fish of "hardy" varieties just die unexpectedly during the first few weeks. Over the nearly thirty years I've been involved in selling tropical fish, I've seen a substantial improvement in the "quality" of Pacific fish, but Atlantic fish seem to be, if anything, more challenging today than a decade or more ago - regardless of which wholesaler I purchase them from.

I realize that success rates may not have anything to do with quinaldine use; certainly handling, shipping and my own system's shortcomings may be bigger factors. It's also possible that routine quinaldine use could reduce risk, as you have stated, to both the target fish and the environment. As such, I can neither advocate nor argue against its use - and I don't believe the AMDA should weigh in heavily on either side of the issue either. What I would like to see, though, is continued dialogue and more information on things like which species are likely to have been collected in this manner. I also hope that the AMDA, in developing a collector certification plan, will include whether or not quinaldine is used, not as a black list, but as a tool for dealers like me to help judge for ourselves whether or not it makes a difference.

injuries to the eye	27%	64%	9%
cryptocaryon or amyloodinium infestation	73%	7%	0%
hemorrhagic septicemia	19%	36%	45%
deep wounds	9%	63%	27%
head and lateral line erosion (hlle)	22%	56%	22%
starvation, wasting	45%	45%	10%
lymphocystis	50%	50%	0%
black spot infestation in surgeonfishes	82%	18%	0%
unknown problem, treated with antibiotics	0%	70%	30%
unknown problem, treated with parasiticide	0%	80%	20%

Thank you again for your article.

Sincerely,
 Jim Kostich,
 Aquatics Unlimited, Greenfield, Wisconsin

Additional comments are solicited. Please let us know your views about any letter that appears in our opinion section.

Husbandry. Seventy-nine percent of respondents routinely hold new specimens for a period of time before resale. The range of time was large, from 2 days to 3 weeks. Wholesalers hold specimens for the briefest period. Several retail respondents commented that the holding period was not absolute. Generally, specimens will be released early at the insistence of customers.

Only 7% of respondents said they found no difference in need for holding time among specimens from different sources, while 80% said sourcing was an important factor. This finding bears out the observation from interviews that for most respondents "knowing the source" of specimens is a major consideration in locating healthy animals.

Respondents reported that, on average, they expect 4% of the specimens in a given shipment to be dead on arrival (DOA), and they anticipate losing an additional 5% of the specimens within 3 days of arrival (DO3). Interestingly, 88% of respondents felt that their reported loss rate was either "average" or "less than average." In fact, 54% reported a loss rate that was greater than the averages just stated. Only 38% of respondents reported losses that were actually below 4% DOA and 5% DO3, respectively. Eighty-five percent of respondents track mortalities, and of these, 73% keep records both by species and source. Seventy-one percent acclimate new arrivals to water conditions in the holding facility. This procedure is considered essential by most practitioners. Nevertheless, respondents who do not acclimate reported no higher DO3 loss rate than those who do.

View of MAC Proposals. Several survey questions were designed to elicit opinion regarding the MAC idea. Respondents were also asked to express their level of agreement with the proposed MAC guidelines. The responses to this section of the survey were quite encouraging, and spotlight areas in which MAC efforts might be targeted. (See Discussion section.)

While only a fifth of respondents said they had received any formal training in the husbandry of marine fish, 100% said they would enroll in a program of formal training if it were made available, and 93% said they would still be willing to participate if travel were involved. Ninety-three percent also said they would pay tuition or other expenses to enroll employees in such a program, and 71% would be willing to provide incentives for employees to seek training.

Regarding the perception of certified specimens in the marketplace, the results of the survey were revealing. One hundred percent of respondents said they were not only more likely to purchase specimens from a certified source, but also that they would be willing to pay a higher price for such specimens. However, when asked if they believe that hobbyists would pay higher prices for certified livestock, respondents were sharply divided. Only 14% percent stated flatly that hobbyists would not pay more, and offered comments that can be summarized as "Most hobbyists shop for price alone." The remaining respondents were equally divided between those who felt hobbyists in general would pay more for environmentally-certified specimens, and those who felt that this would not be a major factor in shaping hobbyist's buying patterns. From comments, it is apparent that most respondents believe hobbyists need to be better educated about the issues before they will accept higher prices for environmentally- certified marine fish. (Hobbyists' views are analyzed in the Discussion section.) Despite these reservations, 85% of respondents said they would be willing to pay a reasonable fee to have their facility certified, suggesting that respondents believe certification would add sufficient market value to make the effort worthwhile.

Most encouraging were the respondents' opinions about the proposed MAC guidelines. Respondents unanimously said they "agree strongly" with guidelines 1, 2, 5, 7, and 10. Further, 100% either "agree strongly" or "agree somewhat" with guidelines 3, 6, 8, 9, 11, and 12. Disagreement was only apparent regarding guideline 4, which deals with "recommended" versus "non-recommended" species. Slightly more than one fifth of respondents said they "disagree somewhat" with this guideline, although the remainder agree. Sixty-four percent said they "agree strongly." The issue of species recommendations is contentious, and is dealt with in more detail in the Discussion section of this report.

Discussion

This study found that marine aquarium dealers are trading in a manageable list of species of reef fishes, and that the majority of dealers utilize a wholesale supplier that imports large numbers of specimens and then holds them in tanks for a short period before reshipping. Clearly, the wholesaler is the "gatekeeper" for the flow of marine life into the United States. Accordingly, MAC efforts should focus on channeling fish from accredited collectors/exporters, through wholesalers who themselves are accredited, to dealers that are likewise accredited. Wholesalers would be encouraged to procure certified specimens by the knowledge that AMDA members, for example, offer a ready market. Respondents to this survey were in overwhelming agreement that they would seek out sources of certified specimens if there were a credible certification program. The finding that most retailers really have no way of knowing if specimens are healthy, apart from long experience with a particular supplier, also lends credence to this supposition. Eighty percent of retailers, however, said sourcing was a major determiner of future performance of the animals in captivity.

One stumbling block to the progress of the MAC program is the obvious disagreement among industry practitioners over what constitutes a sustainable practice, and what standards there should be for proper handling of marine fish inventories. Collectors in Florida widely use quinaldine, for example, and consequently support its use. One even pointed out that preventing a fish from struggling by anesthetizing it might result in less physical damage to the specimen. However, few dealers, and only a tiny minority of hobbyists, were willing to allow use of this chemical as a

"sustainable" collecting technique. This may be a complicated issue. In an interview with Billy Causey, former marine life collector and now director of the Florida Keys Marine Sanctuary, he pointed out that the effects of quinaldine are different for different species of fish. In particular, he cited the commonplace comment among Keys collectors that the Rock Beauty Angelfish (*Holocanthus tricolor*) "really sucks up the juice," meaning that more quinaldine was needed to stun this species than is the case with related fishes, such as the Queen Angel (*H. ciliaris*). Mr. Causey felt this was a major factor in the poor performance of the Rock Beauty in captivity. Others, including several retailers, have raised the issue of quinaldine's effects on non-target species, such as coral polyps. Little research exists on this subject. It would be reasonable, therefore, to err on the side of conservation and to alter the MAC guidelines to exclude any chemical use, including quinaldine, until data are available to substantiate the benign nature of the chemical. This approach, however, may cost support among collectors.

A major difficulty with certification efforts that has been spotlighted by this study is the lack of formalized policies and appropriate record keeping among both retailers and wholesalers. In some areas, records are indeed maintained. For example, 85% of respondents track mortalities both by species and source. Other records, such as inventory velocity reports that would provide information on absolute numbers of individuals handled, are not maintained by half the respondents. Incentives, such as a requirement that records be maintained as a condition of certification, should encourage dealers to alter their policies in this regard.

Perhaps the most contentious issue identified by this study is the issue of "eco-labeling." Clearly, a number of respondents have reservations regarding the creation of lists of "unsuitable" or "unrecommended" species. From numerous conversations, it is the opinion of this author that many retailers and wholesalers fear that such listings will be used to create a ban on the importation of certain species. Further, there is concern that any ban, once in place, will be difficult to reverse. For example, several respondents pointed out that only a few years ago many scleractinians (stony corals) now readily propagated in home aquariums would have been considered "impossible." This finding demonstrates the need for a broad-based effort to disseminate information regarding the captive husbandry of marine aquarium species, including those for which suitable captive conditions are presently undefined, in order to facilitate informed buying decisions by consumers. This would presumably create market pressure to avoid collection of inappropriate species. The finding that a majority of respondents practice informal "eco-labeling" in their businesses further supports this contention. Many respondents also stressed the importance of allowing limited collection of any species for purposes of scientific investigation.

Minimization of loss rates was important to all respondents. Inventory shrinkage is obviously a concern for any business, thus this finding is unsurprising.

Overall, respondents were largely in agreement with the proposals and concepts underlying the MAC idea.

Hobbyist Opinion. It is instructive to compare the opinions of hobbyists with those of business owners regarding the MAC proposals. Hobbyists unanimously believe that suppliers should practice some form of eco-labeling. However, when asked their opinion of MAC guideline #4, concerning unrecommended species, a fifth of hobbyists disagreed, and half of these disagreed strongly. This mirrors the opinions of business owners.

Regarding sustainable collection techniques, only one hobbyist was willing to allow use of quinaldine. As with retailers and wholesalers, hobbyists clearly do not approve of the use of chemicals to harvest aquarium specimens. Seventy-three percent of hobbyists would allow trapping of fish, a finding that demonstrates, as discussed earlier, that those not directly involved with collecting of specimens may not correctly evaluate the hazards that a particular technique presents. Eighty-two percent of hobbyists felt that dealers should stock only specimens procured by sustainable techniques, and 100% agree that dealers should be able to provide information about the country of origin, time in holding, and feeding behavior of any specimen sold.

Unlike dealers, hobbyists were nearly unanimous in the opinion that specimens should be held for a period of time before being sold by retailers. Interestingly, hobbyists were in close agreement that the holding period should be one to two weeks, in contrast to dealers who reported a much wider range for holding time. Hobbyists were willing to tolerate a higher loss rate in holding than dealers. However, this is not surprising, since such a loss is inventory shrinkage to dealers, but is not perceived as a "cost" to hobbyists. On average, hobbyists felt that a DOA rate of 5.3%, and a DO3 rate of 6.9%, are acceptable.

Regarding the MAC program and proposed guidelines, hobbyists were solidly in agreement on most points. Ninety-one percent feel that certification of sustainable harvest is desirable, 82% feel all dealers should receive formal training in husbandry, and, in marked contrast to the predictions of dealers, 90% said they would be willing to pay more for specimens that were certified. Unanimous support was indicated for MAC proposed guidelines 1, 2, 5, 6, 7, and 8, and support for guidelines 3, 10, 11 and 12 was 90%.

Comments indicated that those who disagreed with the guidelines did so for a variety of reasons. For example, one respondent strongly disagreed with the use of random inspections of suppliers, saying this was an unnecessary intrusion. Another, commenting on guideline 12, indicated that law enforcement should not be a part of industry self-regulation. Only 80% of hobbyists agreed with guideline 9; those who disagreed, however, indicated that they did not think handouts and training were sufficient safeguards, and would support stringent monitoring of collectors' activities. (This sentiment was echoed in comments throughout the responses of all survey participants, i.e., monitoring of collectors is considered a key requirement of any certification process.)

Recommendations

Consideration should be given to the following:

1. Alteration of MAC proposed guideline #4 to permit limited collection of difficult species for purposes of scientific investigation. Further effort should be made to create a better working definition of what shall constitute an "unrecommended" species. Abandoning altogether the concept of unrecommended species, in favor of a broad-based effort to educate both hobbyists and businesses regarding captive husbandry and species survival rates, may be a more satisfactory alternative. Neither hobbyists nor businesses expressed concern over the imposition of size limits or non-collection of primary breeders, provided scientific evidence exists to support such restrictions.

Similarly, a better definition of "sustainable collection technique" should be sought. Some respondents commented that any harvest of specimens can be said to cause "damage." It was suggested by several that "no significant damage" to the reef ecosystem be part of the definition of sustainability.

2. The proposed certification program should require better record keeping by participants at all levels in the chain of custody. Only one business respondent tracks individual specimens through a serial numbering system, although with computer technology this should be possible for the majority of dealers. Short of achieving this level of detail, records should be maintained, at minimum, to permit tracking of species, numbers of individuals, in and out dates, sourcing, and mortalities. Ideally, data on facility water analysis, hospitalization duration and outcome, and other pertinent information that might lead to better husbandry should also be tracked. It is important, however, that record-keeping requirements not be so burdensome as to encourage "cheating." Dealers should be educated to help them understand the value of appropriate records, and should receive assistance in the use of data analysis to benefit their bottom line. This approach will encourage record-keeping that is accurate, complete, and timely.

3. Formal policies should be established that provide guidelines for appropriate care, with standardization of practices to the greatest extent possible among program participants. Benefits will accrue not only in that specimens, once harvested and "in the pipeline," will receive proper care, but also in that standardization of procedures, coupled with periodic evaluation of results, will lead to improvements in the procedures themselves.

4. Appropriate training of program participants at all levels is obviously critical to success of the program. A willingness to participate in training was expressed by all businesses responding to the survey.

Finally, it is axiomatic that a perception of added value is essential to the success of the MAC certification program. Stake holders at all levels must believe that certification of specimens is worth any added costs incurred. It is therefore essential that the concept of "certified marine specimens" be credible with consumers. Such credibility will be derived in part as a result of consumer perception of the certifying agency, and it is likely that the reputation of the participating organizations and individuals that ultimately constitute the MAC will be highly significant in this regard. Nevertheless, data demonstrating the increased survivability, for example, of certified specimens versus their non-certified counterparts, will command a greater proportion of the attention of the buying public. Accordingly, it is recommended that investigations to gather data to substantiate the assertion that certified fish will be "better" should be undertaken as soon as possible.

For reference, the MAC guidelines are reproduced below.

MAC Proposed Guidelines

Here are the guidelines currently proposed by the MAC. Specifications for some guidelines, such as species size limits, or parameters for holding conditions, have not been established. Please feel free to make any comments concerning any of the proposed guidelines. For example, if your opinion of one of the guidelines is unfavorable, explain how would you change the guideline to elicit a

favorable opinion.

GUIDELINE 1. Cyanide may not be used to collect any species; all fish must be cyanide free.

GUIDELINE 2. Fish must be collected by use of environmentally safe, i.e., sustainable, collection techniques.

GUIDELINE 3. Collection practices must not threaten local population levels of any fish species, nor impact ecosystem function as understood.

GUIDELINE 4. No collection of unrecommended species is permitted, and adherence to species size limits, including non-collection of primary breeders, is required.

GUIDELINE 5. Precautions must be taken to insure safe transport of specimens from collection site to initial holding facilities.

GUIDELINE 6. Supplier must maintain stable holding facilities, and allow suitable holding time for purge of waste prior to shipping.

GUIDELINE 7. Shipping methods must be chosen to allow for minimum stress, timely arrival, and a verifiable "chain of custody" during transit.

GUIDELINE 8. Mortality from point of collection to 24 hours past final delivery location must be minimized.

GUIDELINE 9. Divers must be provided instruction in proper collection techniques and methodology via handouts, training and monitoring of performance.

GUIDELINE 10. Certified suppliers agree to submit to random inspection of facilities and specimens to insure continuous compliance.

GUIDELINE 11. Local community participation should be encouraged to fullest extent possible. (This guideline applies primarily to collectors in countries with a tradition of community ownership of reef resources.)

GUIDELINE 12. Certified suppliers must be in compliance with all applicable local and international laws.

Editor's Note: As a result of the study reported upon in this issue, these guidelines are being modified. We will publish updates in future issues of *Marinelife Dealer*.

AMDA and the MAC

Here is a summary report on the progress of the MAC proposal that AMDA has been working on with other organizations.

The Marine Aquarium Fish Council: Certification and Market Incentives for Ecologically Sustainable Practices.

By John H. Tullock, American Marinelife Dealers Association, and Jamie Resor, World Wildlife Fund

Abstract

Coral reefs are critical habitat for the diverse marine life that is vitally important to the environmental and economic health of tropical nations with substantial coastal areas. If managed properly, they can provide important resources for local sustenance as well as commercial trade in food fish and aquarium organisms. Display of reef organisms in public and private aquaria is one of the best means to enhance public awareness of reef biodiversity and the need to conserve reef ecosystems. However, coral reefs face numerous threats, including pollution, agricultural run-off, industrial excavation and destructive fishing practices. Consumers in the United States, Europe and East Asian countries are often unknowingly contributing to one of these threats through their support of the trade in marine aquarium fish and invertebrates. That trade is partially supplied by collecting practices that harm the reef itself, or which, in combination with improper handling procedures, result in excessive mortality of harvested organisms.

Such collection practices, which include the use of sodium cyanide and other harmful chemicals, cause destruction or irreversible damage to coral reefs. The adverse effects of these practices have been well-documented in the Philippines and Indonesia. Similarly, although research demonstrates the importance of proper handling after collection in order to reduce mortalities, facilities in some areas are so substandard that only a small percentage of harvested organisms actually survives to be exhibited in an aquarium. In addition to the direct consequences of high post-collection mortality, such mortality is of additional concern because of the added pressure it puts on populations as a result of collection of replacement specimens. Generally, there has not been enough research done to determine what levels of harvest are sustainable for any reef species.

Many individuals and organizations familiar with the aquarium trade including conservation organizations, government agencies, public aquaria, hobbyists, scientists, and the aquarium trade itself have publicized the problem and have designed programs to address aspects of it (e.g., the training of fisherfolk to convert cyanide users to nets instead; improved animal husbandry). Nevertheless, the problem has yet to be addressed comprehensively from reef to consumer, and there has been no market incentive to encourage proper collection and handling practices. The central question that arises is: What can be done to create the necessary market incentive to encourage the utilization of best management practices for the harvest and handling of fish and other marine organisms for the aquarium trade?

To address this question, a cross section of organizations representing the aquarium trade, conservation organizations, public aquaria, hobbyists and scientists propose to establish a Marine Aquarium Fish Council (MAC) that would act as an independent governing council to establish standards, oversee environmental certification and promote conservation education. Actual certification would not be done by MAC but rather would be undertaken by MAC-accredited certification institutions that would apply the standards developed by MAC. The goal of MAC will be to ensure that collection, handling, and sale of marine organisms from coral reefs uses best management practices and is ecologically sustainable, socially beneficial, and economically viable.

Recent Research

The MAC working group commissioned research on two fronts in order to assess the feasibility of the MAC concept. Part 1 consisted of a review of practices by businesses overseas that collect, handle and export tropical marine fish to US customers, conducted by Scientific Certification Systems, Inc. This part of the study was aimed at understanding the chain of events from collection through export, and in particular the potential for documenting or verifying practices and chain of custody. Existing government management programs were examined in order to ascertain how they might be of use in documenting practices and in protecting coral reef fishes and habitats utilized by the aquarium industry. Similarly, the cyanide testing and reform program of IMA-Philippines and the Philippine Bureau of Fisheries was visited to understand how this program could harmonize with the MAC initiative.

Part 2 of the research consisted of a review of business practices, both wholesale and retail, within the United States, and was conducted by John Tullock, Executive Director of the American Marinelifers Association, a trade association concerned with conservation issues in the marine aquarium industry that represents approximately 100 retail and wholesale business operators. This part of the study examined practices from receipt of live specimens from overseas localities through sale to the end consumer, and focused upon understanding of such factors as US Customs and US Fish and Wildlife Service documentation, husbandry practices, inventory documentation, and packing/shipping practices. In addition, opinions were solicited from wholesalers, retailers and hobbyists as to the acceptance of a certification program within the industry.

Preliminary Findings

From the work performed to date, it is possible to highlight some key points. A detailed report of the research is in preparation and will be available in the future. The overseas study found that:

1. It appears practical to implement a program to identify and certify best practices in packaging, handling, transport and shipment.
2. There may be a high degree of uncertainty associated with documentation of collection methods, although it appears that in many cases best practices could be documented..
3. The ability to document chain of custody from collection site to destination country via existing documentation of transactions varies, depending upon the exporting country.
4. It may be possible to certify that no cyanide is used in collection, provided that such a claim meets recognized international standards for certifiable public claims.
5. It may be difficult to substantiate a claim of habitat protection, owing in large part to the lack of data on biodiversity, health, ecological integrity, or population dynamics for reef communities in most of the world, and the non-existence of programs for monitoring of the reefs used for aquarium fish collection. Variation in reef management practices from country to country further complicates this issue.
6. Specific benefits and concerns need to be addressed in terms of the impact of fishing for tropical ornamentals on local communities. In many cases, local communities represent the only means of controlling collection and management practices.

The US study found that:

1. Documentation exists to establish chain of custody from import to retail.
2. There appears to be support for establishing a certification program if it can be demonstrated to be credible. Although support was evident among a majority of both dealers and hobbyists, hobbyists show an even greater level of support.
3. There is concern about listing of "unrecommended" species. A broad-based educational effort regarding captive husbandry and species survival rates, for both hobbyists and businesses, may be a more satisfactory alternative.
4. Better record keeping will be required from participants at all levels in the chain of custody.
5. Data that might lead to better husbandry practices should be tracked.
6. Record keeping requirements should not be burdensome. Dealers should be assisted in the use of data analysis that would benefit their bottom line, as well as further the goals of the MAC.
7. Establishment of guideline for appropriate care, with standardization of practices where feasible, would provide benefits not only in terms of decreased mortalities, but also in that improvements in the procedures themselves can result. There is strong support for training programs that would lead to adoption of standardized guidelines, among both hobbyists and dealers.
8. It is essential that the concept of "certified marine specimens" be credible with consumers. It is recommended that investigations to gather data to substantiate the assertion that certification adds value should be undertaken as soon as possible.

Next Steps

In response to these findings and recommendations, the MAC working committee has refined its goals, as summarized in the following basic principles for certification of marine specimens:

1. The target species and habitat must be managed in a sustainable manner, subject to planning that addresses maintenance of biological diversity, habitat integrity and stability of resource stocks over time.
2. Collected specimens are to be packaged and shipped in a manner that minimizes stress and mortality, ensures long-term survivability, and provides a verifiable chain of custody.
3. Specimens being held prior to receipt by end consumers must be handled using practices that ensure long-term survivability and minimize mortality.
4. Use of marine habitats for the collection of ornamental fish should take into consideration the rights and livelihoods of local communities.

Recommendations are under development to address specific requirements under each of these principles. Under Principle 1, dealing with responsible management of resources and habitat, for example, would be requirements that

collection techniques do not cause excessive damage or mortality to target species, non-target species or habitat. Under this requirement, the use of dynamite or cyanide would be specifically prohibited.

From the research results presented, the MAC working group has concluded that certification of marine aquarium specimens is feasible and can be supported by industry stakeholders. Further action by the MAC working group will include:

1. Legal establishment of MAC as an incorporated entity;
2. Refinement of guidelines and criteria for certification, based on the four principles described above;
3. Selection of a limited number of participants for a pilot certification program;
4. Preparation of educational materials providing information on the aquarium trade, sustainability issues and the certification program, and targeting audiences at all levels, i.e., collectors, exporters, wholesalers, retailers, hobbyists, and the general public;
5. Development of objectives and a feasibility study for improved monitoring of reef habitats.

Commentary

Shortly after this summary was distributed to the AMDA Board of Directors, I received the following comments from Lynne Laurita and Andy Lee of Aqua Trends:

"The overall scope of this document seems to be directly in line with the original goals of the AMDA. How, exactly, does the AMDA fit into this? Are we moving our focus more toward an international role and away from monitoring and educating local marinelife dealers? By doing so, are we minimizing our effectiveness on either front?"

"To fully accomplish the AMDA's original goals, an international effort is needed and it appears that by working closely with the WWF we could accomplish much. It is vital that we not lose sight of our commitment to the local marinelife dealers around the country that have initially supported the organization. That commitment includes educational material, possibly aquarist certifications, and identification of those businesses that adhere to strict standards versus those that do not. If AMDA can balance it's original commitments with this international effort, GREAT! If AMDA can embark on a mission to "certify" international collectors without abandoning it's effort to "certify" local aquarists, GREAT! Since AMDA is in its infancy, we need to keep our goals realistic and attainable. Are we biting off more than we can chew here?"

"It sounds like AMDA is growing rapidly and nicely, and as long as it can be managed, GREAT!!"

Here is my reply to Lynne and Andy's comments:

"Thanks for the nice long letter. You raise important issues. However, I do not want to give the impression that AMDA is losing sight of its original goals. I hope that AMDA can work with the MAC, since it is in our interest to do so. Nevertheless, AMDA exists for the benefit of U.S. retailers and, to a somewhat lesser extent, wholesalers. The MAC is looking at the international issues, and has no plans to certify retail stores. In fact, the consensus among MAC participants, including myself, is that the best approach to effect changes in the industry is to work with 1) collectors and exporters overseas, and 2) importers in the U.S., Europe, etc. There are perhaps only 25 individuals/companies that are responsible for most of the imports of ornamental marine fish from Asia. Obviously, it is easier to work with this small number than to try to tackle the perhaps 4,000 retail shops that carry marine fish. In an ideal world, AMDA retailers would purchase certified fish from MAC-certified sources.

"Regarding AMDA efforts at certifying and/or training retailers, establishing a training program and granting a diploma is a good idea. Attempting to "certify" some level of performance/quality for individual business is fraught with serious problems, not the least of which is the legal issue of attempting to restrict commerce. We must be very careful about claims of AMDA "certification," or we will get sued.

"Looking back at the "Introduction to AMDA" sheet that I mail out to potential members, I state that the "watchwords" for AMDA are "communication and continuing education." These are the areas in which we should be focusing our efforts. Communicating with members about industry news that affects them, about new techniques that they can use to build their businesses, and about new information on species husbandry would be one aspect of our daily service to the membership. Another would be communication with hobbyists regarding the benefits of shopping with AMDA members. We utilize our web site to do this, as well as magazine ads.

"Continuing education is easy to do in theory, a bit harder in practice. I think we should devise a program of instruction similar to that which PIJAC has done for freshwater aquarists. There is a workbook, live seminars in conjunction with major trade shows, and a written exam. There is only one level of diploma in their existing programs, although I think AMDA should have two. One "master" level for business owners, for example, and another, simpler level for staff. PIJAC is talking about creating a "Pet Care Specialist" program for marine aquarists, but any finished product is many months away. We should copy their basic approach, however. Another effort that PIJAC is looking into for dog/cat training is video conferencing, something we should also consider, depending upon member demand, preferences and budget. Our best bet for face-to-face work with members is at an existing trade show or hobbyist conference.

"In short, I think we should focus on these two areas, continuing education and skills recognition for retail businesses, and leave the broader picture to the MAC, which will have the funding to do it, and is willing to work with retailers through AMDA. I see no reason why we should not continue to cooperate with the WWF on the MAC project, since AMDA and MAC complement each other in terms of their efforts."

Please let us hear your views on these issues.

[American Marineline Dealers Association](#)
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