PRELIMINARY SUMMARY OF THE MANAGEMENT AND DEVELOPMENT OF HARVESTING AQUARUIM FISH ON GUAM

PREPARED FOR THE
GUAM MARINE FISHERIES
ADVISORY COUNCIL

BY THE

GUAM COASTAL MANAGEMENT PROGRAM

MARCH 1980

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A. IDENTIFICATION AND BIOLOGICAL ASSESSMENT

Aquarium fish comprise a unique segment of the near shore reef fauna that has been dealt with on a larger scale in Preliminary Summary of the Management and Development of Harvesting Reef Fish on Guam, a report prepared for the Guam Marine Fisheries Advisory Council. These generally smaller species of reef fish, like the large fish, are subject to exploitation. They are harvested by both commercial and private aquarium interests. Management policies are needed because they not only function as an integral member of the reef ecology, but also, they are a major aesthetic attraction for recreational snorkelers and divers. These species are considered in a separate plan because their management presents unique problems that derive from their high value, based on aesthetic appeal.

A strict definition of this resource is difficult to make. At best, the aquarium fish can be defined as the smaller, more colorful of the bony fishes inhabiting the near shore reef flats, channels, bays, lagoons, and reef margin down to a depth from which they can be conveniently brought up alive (about 60 ft.). Whether or not a particular species will be subject to fishing pressure depends on its marketability, the rarer, "poster color" species being the most sought after.

Table 1 lists those families of finfish found in Guam waters that are commonly harvested as aquarium fish.

A limited amount of data is available concerning the biology of aquarium fish. Several qualitative assessments have been made at several sites locally (Amesbury, 1978; Stojkovitch, 1977; Kami et al.,1965; Kami, 1975) but no islandwide quantitative data is available from which estimates of sustainable yield can be derived. It should however, be noted that the reef fish population dynamics are probably affected more by habitat availability than by fishing pressure (Ehrlich, 1975), since there is most likely a large pool of young fishes that are available to reoccupy any segment of the reef that has suffered a decline in the adult population. Data however, is needed regarding the rarer, and therefore much sought after species, which, theoretically, may not be able to recover from a disproportionate decline in numbers.

For most species, biological data regarding the relationship between population and available habitats will be needed in addition to census data; as harvesting methods are not likely to exhert significant fishing pressure on these stocks. Due its inaccessability to collectors during most of the year, the windward side of the island probably provides a natural "seed" area for juvenile recruitment, reducing the need for harvesting restrictions at this time.

B. STATISTICAL MONITORING OF FISHERY CATCH AND EFFORT

Currently, no reliable statistics are available concerning aquarium fishery catch and effort. The Department of Aquatic and Wildlife Resources (DAWR) does include aquarium fish in its creel census, but data from this source is sporatic. Most species are harvested by individuals using hand nets and scuba, which is difficult to monitor. Monthly catch reports are required by small mesh net permit holders, but this provision is rarely complied with. As of January, 1980, there were only three current permits on file with DAWR.

Commercial collectors are reluctant to impart any reliable information. One individual, collecting part-time for a local pet store, estimated his average weekened catch at 25 to 75 pieces.

It was possible to obtain catch records from the only commercial operation, shipping fish off island, for the month of November and half of December of 1979 through DAWR. There were, however, no catch records turned in during the permit holders' previous 6 months permit period. Table 2 lists those fish reported to have been harvested over a 6 week period.

It can be noted that the most heavily exploited groups, are the angelfish (family Pomacanthidae) and the butterflyfish (family Chaetodontidae), together comprising over half the aquarium fish taken in a six week period by this particular enterprise. These species are generally considered to have a high recruitment rate (Randall, 1968), mitigating any danger of overharvesting.

Still, there is no way to estimate the number of private collectors who fail to obtain permits at all. It would seem that the current fishing effort is not large, but it is obvious that a reliable method of obtaining statistics be implemented if data is going to be made available on which to base decisions regarding future management policies.

C. IDENTIFICATION AND EVALUATION OF TECHNIQUES AND FACILITIES FOR HARVESTING, HANDLING AND SHIPPING

The techniques for the harvesting and handling of aquarium fish are based on the fact that the resource must arrive at its destination alive and in good health.

Collecting is generally done with scuba, utilizing small-mesh hand nets and barrier nets. The barrier nets are stretched across the bottom of the reef and the fish are herded into the net, trapped and then captured with the hand nets. Hawaii limits the length of barrier nets to 100 feet, the rationale being that a longer net cannot be efficiently fished and too many fish may become gilled.

Species which flee rather than hide (eg. butterflyfish, surgeonfish and wrasses) are most often those trapped using barrier nets (Walsh, 1978). Species which retreat to cover (eg. triggerfish, angelfish and damselfish) must be captured entirely by hand nets, sometime requiring that cover be reduced until the fish is sufficiently exposed to make the capture.

Although illegal on Guam, the use of intoxicating substances such as arsenic and sodium cyanide is common in some areas such as the Philippines. Fish captured in this manner are generally less hardy and often unable to withstand shipping. For this reason, the use of these substances is generally not a problem among serious collectors on Guam.

Once fish are captured, they are placed in underwater containers and transported to larger containers in the boat. Local collectors will then proceed to the pet stores with their catch, eliminating the need for extensive holding facilities. However, if the fish are to be shipped, they must be held for a minimum of 3 days to allow for the evacuation of nitrogenous wastes before individual packaging for shipping. This holding period also ensures that only strong, healthy fish, capable of surviving the trip, are shipped.

The holding tanks must be filtered, aerated and maintained at optimum pH and salinity. In large systems, ultra-violet sterilizing units are used to control the high bacteria concentrations that result from fish waste. About three gallons of water per fish is required in holding tank situations.

After the holding period, fish are then packaged in plastic bags containing one third seawater and two thirds oxygen. Valuable species, or those with spines capable of injuring another fish are individually packaged, while the hardier, gregarious species such as damselfish can be shipped en masse.

D. ASSESSMENT OF COSTS OF PRODUCTION

Cost involving the harvest of aquarium fish for sale off-island involves those of capture, holding and shipping. Home aquarists and small-scale local commercial operations are only faced with the costs of collection.

Minimal costs of collection include the price of hand nets (about $10.00) and collection jars which can be home-made at a minimal cost. Scuba gear is required for the harvest of deeper species, as are barrier nets (about $100.00) for commercial operations. In the case of large scale harvesting, the use of a boat to reach less accessable collecting areas is necessary. Daily boat operating expenses on Guam run about $40.00 per day. The use of small mesh nets also requires a permit, valid for six (6) months at $5.00.

Once caught, the local collector needs only large buckets in which to transport his catch to the home aquarium or to a local pet store for sale. However, the commercial collector, shipping off-island, requires holding facilities capable of keeping the fish in good condition until they are ready to be shipped. Aquarium fish require about three gallons of fresh, aerated water in order to remain healthy. The size of the operation will depend on the number of holding tanks required, a tank set-up with a 100-gallon capacity costing from $300.00 on up.

At current freight rates (January 1980)* the cost of shipping one fish to Honolulu, requiring one pound of water is about $1.00. Fish being shipped to Los Angeles (weighing about two pounds in water) cost about $2.00 per fish in shipping charges if the fish is shipped individually. Hardy, gregarious species can be packaged together to reduce shipping costs.

E. MARKETABILITY AND VALUE OF RESOURCE

The demand for aquarium fish is high in the continental United States. The popularity of aquariums and the difficulties involved with maintaining a healthy marine system ensure that a constant stream of popular aquarium fish are required.

However, eventhough the demand is high, competition from areas such as the Philippines, whose labor costs are low, keeps prices down. At current mainland prices, one collector was only able to obtain $4.50 for a clown trigger (Balistoides niger) and $4.00 for an imperator, angelfish (Pomacanthus imperator), two highly valued species. The more common butterfly-fish could be marketed for $0.35 to $1.00. Damselfish bring only about $0.06 a piece at this time.

Local pet stores'prices to the collector range from about $1.00 per fish to several dollars for rarer species. The local market for aquarium species is somewhat limited since the resource is readily available to the amateur collector.

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* On February 22, 1979, PanAm suddenly raised their 1000 lb. commodity freight rate by 15% forcing the only commercial enterprise shipping off island out of business.

F. ENVIRONMENTAL CONCERNS

Environmental concerns regarding reef fish as a whole have been addressed in an earlier report Preliminary Summary of the Management and Development of Harvesting Reef Fish on Guam. Several aspects of reef ecology, however, demand special attention with respect to aquarium species.

The collection of aquarium finfish is concentrated on a small number of species. Fortunately, most of these species are common and recruitment is high (Randall, 1978). Some species, through, by virtue of their rarity, are highly valued and, thus, may be vulnerable to the effects of intensive collecting (Walsh, 1978).

The ecological impact of harvesting aquarium species can be assessed on two levels. Removal of individuals of most species from the reef environment is not likely to result in species extinction or adversely affect reef ecology (Taylor, 1968). However, reducing the numbers of showy fishes on the reef may have an impact on visual quality for divers, snorkelers and photographers; especially when the fish most likely to be caught are the most obvious. A species having a wide range of depths at which it is found may be noticeably reduced at the shallower depths (most frequented by snorkelers); but with respect to total population, the effect may not be significant.

Outside of contributing to the visual quality of the reef, popular aquarium species comprise an important ecological unit in the reef community structure. Herbivores graze on algal filaments, indirectly promoting coral recruitment, while exerting selective pressure on benthic marine invertebrates (Ehrlich, 1975). Herbivores that are sought after as aquarium fish include tangs (family Acanthuridae), some butterflyfish (family Chaetodontidae) and angelfish (family Pomacanthidae), damselfish (family

Pomacentridae) and sharp-nose puffers (family Canthigasteridae). Carnivorous species such as triggerfish (family Balistidae) prey directly on echinoderms; and the much sought after lionfish (family Scorpaeidae) is a piscivorous carnivore, damselfish comprising a large portion of its diet. Other predators of marine invertebrates include the hawkfish (family Cirrhitidae) and some wrasses (family Labridae).

The wrasses of the genus Labroides, particularly L. dimidiatas, are postulated to provide a unique ecological service. This group of "cleaner wrasses" consumes mucus, scales, damaged or diseased dermal and epidermal tissue, and ectoparisitic copepods from other reef fishes (Ehrlich, 1975), going as far as to set up "cleaning stations" which are visited by prospective cleanees. Limbaugh (1954) removed all known cleaners from a section of reef and noted a drastic decline in species diversity. These results, however, have not been duplicated by other investigators attempting to repeat the experiment. A local study in this regard could be initiated to determine the ecological ramifications of the removal of these "cleaners" from the reef. However, the current fishing effort with respect to this species is negligible (Table 2), since they are difficult to collect and demand for them is not great. Such a study would only be of academic interest at this time.

Most likely, the factor most detrimental to aquarium finfish populations is habitat destruction. Taylor (1968), states that housing, rather than recruitment, is the limiting factor in reef fish populations. One commercial aquarium fish-diver expressed the opinion that destruction of suitable habitat is the main reason for the comparative scarcity of fish on Guam. He stated that he observed dynamiting operations almost daily off of Cocos reef during the month of December of 1979.

There is some indication that collection in the absence of habitat destruction can actually result in population increases. Nolan (1968) looked at population trends of the five most heavily collected species in two areas on Hawaii: an experimental site subject to heavy collection and a control site where collection was restricted. There was an apparent increase in four out of five species at the collected sites over the non-collected sites. The fifth species, Centropyge potteri (Potter's angelfish), showed a minor decline over control levels, but no major decimation. This particular species has a limited home range and is found in relatively low densities and is, thus, possibly more suseptable to over-collection than the other observed species, Zebrasoma flavescens (yellow tang), Chaetodon multicinctus (pebbled butterflyfish), Forcipiger flavissimus (long-nosed butterflyfish), and Naso lituratus (smoothhead unicorn fish). Although this apparent overall increase in fish populations cannot be unquestionably attributed to collection activity, Nolan (1968) states that it is possible that by removing fish that monopolize shelter and food, there is a release of inhibition on recruitment of juveniles.

Nolan (1968) also suggests that, except for those species that brood their young, recruitment will depend upon "upstream" breeding activity. So that, given an adequate supply of housing, a reef will become repopulated as long as there is a plentiful supply of larvae originating in areas from which the currents derive. Therefore, strict enforcement of laws restricting the use of explosives, the major cause of habitat destruction, is needed to ensure that larvae will have a place to settle.

Enforcement of laws forbidding the use of poisons such as hypochlorite bleach should also be implemented in any fishery management policy. The practice of poisoning fish is particularly detrimental to the ecology of such permanent residents as the Pomacentrids and Eupomacentrids which are

strongly territorial, defending very restricted areas of the reef, and thus most susceptable to local adverse ecological events. Pomacentrus flavicauda has been observed to remain within a $2m^2$ area over a period of 5 months (Low, 1961); while another pomacentrid, Amphiprion spp., has been recorded as living for 30 months with the same anemone (Allen, 1972).

A more in depth account of the consequences associated with the degredation or total destruction of habitat is presented in Preliminary Summary of the Management and Development of Harvesting Reef Fish on Guam. Of particular concern is the habitat degradation resulting from excessive siltation caused by construction projects that have not been properly designed or executed with respect to minimizing ecological impacts. The Government of Guam can play an important role in the mitigation of these effects by creating and enforcing regulations minimizing siltation resulting from construction projects that affect reef ecology.

Since aquarium fish must be captured alive and well enough to tolerate shipping, most methods of harvest are, in themselves, nondestructive, although some coral destruction is a possibility in the course of pursuing a particularly valuable species. However, the most destructive effects on habitat are incidental to illegal fishing practices that include the use of explosives and poisons.

Given the available data, the main thrust of aquarim fisheries management should be directed toward the preservation of suitable habitat and the careful selection of a few marine sanctuaries to act as "seed areas" until such a time that more indepth studies can be made.

G. SOCIO-CULTURAL CONCERNS

The keeping of aquariums is not a component of Chamorro culture. However, the traditional subsistance fishery concentrates on many species commonly

taken as aquarium fish. Few local fishermen venture beyond the reef margin. Small mesh nets are used to capture juveniles and small in-shore species, prefered by the local population. Within the freezers of small "mom and pop" markets, chaetodons, damselfish, tangs and squirrelfish can be seen offered for a sale as foodfish.

The wholesale taking of seasonal juveniles (eg. mañahak, ii, tiao, menis) using small mesh nets is also effective in removing the juveniles of aquarium fish from their common shallow breeding grounds, thus, adversely affecting the aquarium fish populations. There is currently no permit requirement for this activity; however, the selective taking of aquarium fish, which does not significantly impact upon the subsistance fishery, is an activity for which a permit must be obtained and monthly catch records be submitted.

It is evident that a uniform application of the small mesh net fishing regulations should be applied. Unfortunately, the socio-cultural constraints on any attempts to regulate a subsistance fishery will make this a difficult task to accomplish.

H. LEGAL ISSUES, FEDERAL CONSTRAINTS, FEDERAL FUNDING AND REGIONAL OPPORTUNITIES

1. Legal Issues

The taking of aquarium species is regulated by P.L. 12-215 (See Appendix No. 1) which requires that persons catching live fish for aquarium purposes obtain permits from the Director of Agriculture for the use of small mesh nets, the greatest frame opening not exceeding twelve (12) inches. Such species as mañahak (juvenile rabbitfish), tiao (juvenile goatfish), ii (juvenile carangid) and aguas (juvenile mullet) are excluded from this regulation as they are not considered aquarium fish.

Appendix No. 2 lists proposed changes in the section of the Government Code of Guam relative to the harvesting of aquarium fish with small mesh nets, currently being considered by GMFAC.

As of January 1980, only three permits were in effect, two of them for commercial operations. Only limited catch records (data for six weeks) from one permit holder were on file, eventhough it is stated on the permit that failure to report monthly catch records would result in revocation of the permit. Current commercial licenses restrict the taking of aquarium fish in the following areas:

a) Cocos Lagoon, inside the barrier reef

b) Apra Harbor

c) Agana Boat Basin

d) Tumon

e) Anae Island, from Nimitz Beach to Facpi Point

Currently, permits are required only for the use of small mesh nets in the aquarium fishery. Gill and surround netters, while probably having a greater impact on small reef species, are not required to have permits nor are they required to make catch reports.

As stated earlier, a uniform application of fishing regulations should be policy, if it is going to be possible to monitor this resource.

Proposed modifications to the current permit system are found in Appendix No. 3.

2. Federal Constraints

No identifiable federal constraints with respect to the taking of aquarium fish have been determined at this time.

3. Federal Funding

Efforts to identify federal funding for stock assessments and related research must still be undertaken.

4. Regional Opportunities

Although aquarium fish are a territorial resource, restricted to near-shore waters, many closely related species are exposed to the same type of exploitation in other regions, notably Hawaii. Regional opportunities for biological research in areas of recruitment, growth rates, life history, ecology, etc., may prove to be of mutual benefit in the management of related resources.

I. RECOMMENDED POLICIES

1. Conduct a thorough stock assessment of exploited species.
2. Assess the ability of commonly harvested species to recover from varying degrees of fishing pressure and determine a timetable for the opening and closure of heavily fished areas to facilitate stock revitalization.
3. Determine which species, if any, are subject to population decimation resulting from over-collection and regulate the taking of such species accordingly.
4. Make an assessment of prospective marine sanctuary locations in areas where snorkeling is popular and/or in areas "upstream" of heavily collected areas; and determine to what extent, if any, a marine sanctuary system is needed.
5. Strictly enforce laws relative to the prevention of habitat degradation and destruction.
6. Examine the current permit system for net fishing with the intention of uniformly applying regulations to all net fishermen affecting the aquarium fish resource and strictly enforce monthly catch record

requirements for such permits.

7. Initiate studies investigating depth ranges and relative abundance at depth of commonly harvested aquarium fish.

8. Encourage development of a system of artificial reefs in heavily collected areas.

9. Strictly enforce provisions of the Clean Water Act having to do with construction affecting coastal waters and closely monitor all such construction projects to ensure compliance with GEPA water quality standards.

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Table No. 1 - Fish Families From Which The Smaller Species Are Commonly Harvested As Aquarium Fish

Acanthuridae	Surgeonfish, Tangs
Antenariidae	Angelerfish
Apogonidae	Cardinalfish
Balistidae	Triggerfish
Canthigasteridae	Sharp-Nose Puffers
Chaetodontidae	Butterflyfish
Cirrhitidae	Hawkfish
Eleotridae	Sleepers
Gobiidae	Gobies
Labridae	Wrasses
Lutjanidae	Snappers
Monacanthidae	Filefish
Mullidae	Goatfish
Ostracionidae	Trunkfish
Pomacanthidae	Angelfish
Pomacentridae	Damselfish & Clownfish
Pomasydae	Grunts
Serranidae	Groupers
Scorpaenidae	Scorpionfish
Zanclidae	Moorish Idols

Table No. 2 - Aquarium Species Reported To Have Been Collected Over A 6 Week Period (DAWR) By One Commercial Operation

COMMON NAME	SPECIFIC NAME	NO. HARVESTED (11/7 - 12/8)
Angelfish	family Pomacanthidae	1400
Dusky Angel	Centropyge bispinosis	643
True Lemon Peel	C. flavissimus	431
False Lemon Peel	C. heraldi	177
Flag Fin Angel	Centropyge spp.	67
Flame Angel	C. flammaes	13
Coral Beauty	C. shepardi	2
Vroliki	C. vroliki	1
Regal Angel	Pygoplites diacanthus	43
Imperator Angel	Pomacanthus imperator	23
Butterflyfish	family Chaetodontidae	624
Assorted Butterflyfish	-	116
Long-Nosed Butterfly	Forcipiger flavissimus, F. longirostis	117
Double Saddle Butterfly	Chaetodon falcula	90
Merten's Butterfly	C. mertensii	57
Racoon Butterfly	C. lunula	49
Threadfin Butterfly	C. auriga	37
Teardrop Butterfly	C. unimaculatus	34
Saddleback Butterfly	C. ephippium	33
Red-finned Butterfly	C. trifasciatus	21
Reticulated Butterfly	C. reticulatus	20
Bennett's Butterfly	C. bennetti	12
Clown Butterfly	C. ornatissimus	10
Four-Spot Butterfly	C. quadrimaculatus	9
Dirty Face Butterfly	Hemitaurichthys polylepis	1
Poorman's Moorish Idol	Heniochus chrysostomus	18
Clownfish	family Pomacentridae	103
Blue Stripe Clown	Amphiprion melanopus	75
Xanthrus	Amphiprion spp.	16
Cinnamon Clown	Amphiprion spp.	7
Skunk Clown	A. perieraion	5
Damselfish	family Pomacentridae	56
Lionfish	family Scorpaenidae	22
Lionfish	Pterois antennata	20
Lionfish	P. radiata	2

(Cont'd)

Pufferfish	family Canthigasteridae	312
Assorted Puffers	-	299
Blue Box Puffers		13
Tangs	family Acanthuridae	80
Blue Tang	Paracanthus hepatus	20
White-Tail Tang	Acanthurus glaucopareius	19
Naso Tang	Naso literatus	13
Clown Tang	Acanthurus lineatus	12
Orange-Sholder Tang	A. olivaceus	12
Sail Fin Tang	Zebrasoma flavescens	4
Triggerfish	family Balistidae	22
Assorted Triggerfish	-	10
Pink-Tail Trigger	Melichthys vidua	7
Clown Trigger	Balistoides niger	3
Humuhumunukunukuapuaa	Rhinecanthus aculeatus	2
Wrasses	family Labridae	23
Assorted Wrasses	-	22
Dragon Wrasse	Xyrichthys taeniourus	1
Cleaner Wrasse	Labroides dimidiatus	0
Miscellaneous		459
Assorted Groupers	family Serranidae	14
Golden Strip Grouper	Grammistes sexlineatus	1
Assorted Hawkfish	family Cirrhitidae	33
Flame Hawk	Neocirrhites armatus	288
File Fish	family Monacanthidae	52
Zebra Gobie		42
Morrowish Idol	Zanclus cornutus	24
Yellow Headed Sleeper	Valenciennea strigata	4
Trunkfish	family Ostracionidae	1

REGULATIONS AFFECTING THE USE OF SMALL MESH NETS

"Section 12305. Net, minimum size. It shall be unlawful for any person to use a net (other than small scoop nets) with a stretched mesh of less than 1½ inch; provided however, that:

(a) Persons may use nets of smaller mesh to take only manahak during all months of the year. Manahak is defined as the post-larval stage (total length of less than 2½" of the rabbitfish, Family Teuthididae).

(b) Persons may use small mesh cast nets (talaya) for the taking of fish other than manahak during all months of the year.

(c) Persons catching live fish for aquarium purposes may obtain permits from the Director of Agriculture for the use of small mesh nets to capture aquarium type fish only. For purposes of this regulation, the manahak, tiao (juvenile goatfish), ii (juvenile carangid), and aguas (juvenile mullet), are not considered aquarium type fishes. Also a small scoop net is defined as a framed net, usually with a handle attached and the greatest frame opening not exceeding twelve (12) inches.

(d) Persons engaged in tuna fishing may apply for permits from the Director of Agriculture to capture live bait fish such as menis (Spratalloides spp.), ginyo (Atherinidae), fadya (Engraulidae), and other suitable bait fish; but will not include the aguas, tiao, ii, and manahak except as allowed in provisions (a) and (b).

(e) That the above provisions stipulated in (a), (b), (c) and (d) are not applicable in any areas designated as conservation areas where the taking of all seasonal fishes are prohibited.

(f) The native inhabitants shall at all times enjoy their traditional rights to conduct gadi and lalago fishing.

Any violation of this Act shall be punished as described in Sections 12322 and 12323 of the Government Code of Guam."

PROPOSED REVISED SMALL MESH NET REGULATIONS

Section 12308.1. Net mesh size. It shall be unlawful for any person to use nets (other than small hand nets) with a stretched mesh of less than 1½ inches provided, however, that:

(a) Persons may use nets of smaller mesh to engage in traditional fishing methods for the taking of seasonal juveniles as: rabbitfish (manahak), skipjack (ii), goatfish (tiao), mackerel (atulai), herring (menis), and mullet (aguas).

(b) Persons catching live fish for aquarium purposes may obtain permits from the Director of Agriculture for the use of small mesh nets to capture aquarium type fish only. For purposes of this regulation, the manahak, tiao, ii, aguas, atulai and menis are not considered aquarium type fishes. The use of small mesh nets for the taking of aquarium fish is limited to small framed hand nets, the greatest frame opening not exceeding twelve (12) inches; and barrier nets measuring less than 100 feet in length.

GOVERNMENT OF GUAM
DEPARTMENT OF AGRICULTURE

REGULATION NO.

HARVESTING OF LIVE AQUARIUM FISH

Pursuant to the authority vested in the Director of Agriculture by Sections 12007 and 12321, Government Code of Guam, the following regulations pertaining to the harvesting of live aquarium fish are hereby approved:

1. COMMERCIAL HARVESTING OF LIVE AQUARIUM FISH

   a. LICENSE: Each commercial aquarium fish operation must obtain a license from the Department of Agriculture. The license fee shall be $25.00 per commercial operation and shall be valid for one year.

   b. INSPECTION OF HOLDING FACILITIES: The Department of Agriculture shall inspect the holding facilities of each permit applicant to ensure that fish harvested will be kept alive and in reasonable health. The Department of Agriculture will promulgate such standards and regulations as needed to carry out the intent of this regulation.

   c. AREAS: The harvest of aquarium fish is allowed in all areas except the following:

      (1) Luminao Barrier Reef, on the Philippine Sea side from Cabras Island to the extreme western tip of Glass Breakwater.

      (2) Anae Island, from Nimitz Beach to Facpi Point.

   Provided that the Department of Agriculture shall have the authority to affect temporary area closures for the purpose of stock revitalization in areas were fish populations have been determined to have undergone decimation due to overharvesting or other ecological

disturbances. In any case, restrictions shall not be imposed or more thana period of six (6) months, at which time, stock reassessment shall be made to determine whether or not restrictions should continue; nor shall the total area under closure exceed 2% of Guam's coastaline (2.4 miles) at any one time.

d. RESTRICTED SPECIES: The Department of Agriculture shall have the authority to limit or restrict the collection of such species whose populations it has determined to be susceptable to the effects of over-collection.

e. BAG LIMIT: The bag limit for aquarium fish taken alive for commercial purposes shall depend on the size of the permittee's holding facilities. Upon the inspection of holding facilities, the Department of Agriculture shall determine how many fish can be reasonably maintained at any one time and this "bag limit" shall be stated on the permit.

f. COMMERCIAL COLLECTORS" Monthly reports shall be required of all commercial operations listing the names and permit numbers of all persons either under their direct employment or from whom they have purchased aquarium fish.

2. HARVEST OF AQUARIUM FISH FOR HOME DISPLAY

a. The harvest of aquarium fish for purposes of home display shall not be subject to regulation.

3. FOR PURPOSES OF THIS REGULATION

a. AQUARIUM FISH: Aquarium fish is defined as any member of the phylum Osteichthyes that is captured alive for the purpose of eventual aquarium display. For purposes of this regulation, juveniles such as manahak (rabbitfish), tiao (goatfish), ii (carangid) and aguas (mullet) are not considered aquarium type species.

b. COMMERCIAL HARVESTING: Commercial harvesting is defined as the harvesting of aquarium fish for the purpose of selling or displaying the organism for financial gain.

c. HOME DISPLAY: Home display is defined as the keeping of live aquarium fish for ornamental purposes only.

d. COMMERCIAL OPERATION: Commercial operation is defined as any enterprise maintaining holding facilities for aquarium fish from which financial gain is derived, whether for sale or display. This includes, but is not limited, to retail pet stores, commercial harvesting interests, aquarium display, etc.

Dated this _____ day of _____, 1980.

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ANTONIO S. QUITUGUA, Director
Department of Agriculture