# FADs for aquarium fish – an alternative capture method?

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While watching a few young fishers in the strait between Bali and Java cling to floating debris such as tree branches and banana tree stumps, among numerous plastic bags and food wrappers, three thoughts came to mind. The first was that the household waste problem is now becoming a huge issue that needs to be dealt with in that area to protect the marine environment and to provide a worthwhile experience to diving tourists. The second thought was that timber is still being cut somewhere nearby, and the third thought was more a question: 'What are these fishers doing?' It turned out that the fishers were catching many live juvenile and adult reef fish, which trade for high prices in the ornamental industry. During the rainy and windy season, aquarium fish collectors diving with hookah compressors and cyanide have difficulty in operating. Strong currents restrict their operations, which is good from a conservation perspective, but not from the fishers' perspective. Creatively, and with their knowledge of fish behaviour, they float with the current, while scooping their little treasures from under the debris, where a variety of species, even those that are known to stay close to the reef substrate, appear to have aggregated.

A few weeks later, while we were discussing artificial reefs and, in particular, that many studies show artificial reefs to aggregate reef fish rather than add fish biomass or reef structure, the thought struck. Why not aim at developing a structure that acts as a fish aggregating device (FAD) for aquarium fish so as to provide fishers with an alternative capture method. The work plan was made and the fishers who were approached to join in the design and testing of the aquarium fish FAD were very enthusiastic.

Since early 2002, and together with a group of fishers from Sumber Kima, a village in west Bali known to house cyanide and blast fishers, a number of FADs have been designed. The designs fall in two main categories: portable FADs and permanent FADs. The conditions for FAD design include:

- The material and making should be cheap.
- Discarded fishing material should be used as much as possible (recycling).
- The design should allow for easy capture, while at the same time provide an interesting structure for the fish.

Field-testing of the various designs, both the portable and permanent types, started in April. Parameters that were varied and measured included:

- distance of the FAD to the reef,
- time lapsed before particular number of fish inhabits the FAD,
- species composition of the fish that inhabit the FAD,
- ease of harvesting (either with snorkel / hookah and scoop net, or with surrounding net in combination with scoop net),
- effect of disturbance from harvesting on the time required for recolonisation of the FAD, and
- longevity of the FAD material.

FADs may not serve all needs of the trade. Some species or sizes will be attracted to FADs whereas other may never be lured to inhabit it. Also, the colonisation process may take too long before a commercially interesting number of fish inhabit the FAD. Thus, a portable FAD, intended to be taken on long-range boats to remote areas, may not be as economically viable as for example a permanent FAD. Also, in case the FAD would be highly effective for a selection of species, the issue of species- or size-overfishing must still be addressed. However, by providing an opportunity to catch high-demand fish away from the actual reef with its delicate structure, direct damage from use of cyanide or coral breaking, may be minimised, at least for some target species.

The WWF team invites a large audience to join in developing and applying this methodology. At this stage, creative designs and other input is highly valued. Together with groups such as the Marine Aquarium Council, we aim at transforming the ornamental fish trade into a non-destructive, ecologically sustainable and economically healthy business.

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