

RAISING NAPOLEON?

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The high value Napoleon fish (or Humphead wrasse) is an iconic reef fish that grows to the size of a large man. Found in shallow tropical waters of both Indian and Pacific oceans, stocks of Napoleon fish have declined in both size and number in the last 20 years, prompting an international treaty to support its protection¹. The listing level adopted by the international community² still allows exports, but only under strict management conditions that ensure that international commercial marketing is not detrimental to the sustainability of remaining stocks.

From experience, fisheries managers have learnt a few things about the productivity of reef fisheries. The first is that small amounts of fishing can actually increase productivity by removing the oldest individuals, while too much fishing can reduce adult numbers to a point where it impacts the production of future generations. Fishery managers also know that selecting the right level of fishing to maximize catch usually targets fish that have been given a given a chance to reproduce and that it is advisable to leave the juveniles to grow. However, all this knowledge centres on larger fish and the more ‘typical’ fisheries in which the fish are taken to be eaten immediately or sold

as food. However, as demand for fish grows and as the numbers of larger fish in the wild declines, an increasing number of fisheries are taking fish at smaller and smaller sizes and younger ages. Some of these are taken directly to eat or sell but small fish with little immediate value are also increasingly taken to ‘grow-out’ in cages for months, or even years prior to sale. This is a process recently termed ‘capture – based aquaculture’.

There is a certain type of CBA that has long been practiced with marine invertebrates that involves the collection of tiny post-settlement phase larvae for grow-out to market size. By taking the tiny larvae and protecting them from predation, and perhaps feeding them artificially, the high early natural mortality typical of marine species is reduced and the ‘saved’ animals diverted to culture and sale without, if managed properly, impacting the abundance of wild stocks. Could this same practice be done viably for a marine fish?

In Jakarta³, Napoleon fishermen and traders from Indonesia’s North West Anambas and Natuna group of islands got together with Government Officials from Ministry of Marine Affairs and Fisheries and Ministry of Environment and Forestry, Indonesian Institute of Sciences, biologists and international advisors to discuss and

¹ Convention on International Trade in Endangered Species (CITES)

² CITES II

³ 7-11 December 2015

explore novel methods for managing this nascent form of CBA. The aim of these meetings was to give a formal footing to plans to conserve the conservation-dependent Napoleon fish in the Anambas/Natuna Islands whilst maintaining the option for these remote communities to derive incomes.

In exploring ways to make a livelihood from the live fish trade with Asian markets, and after depleting stocks of adults from cyanide fishing, local fishers and fish farmers started to discover some secrets of the Napoleon's early life cycle. These are secrets because although all of us recognize the majestic shape, bright colour and general appearance of the adult fish, little was known about the mottled black and white juveniles and even less about its very early post-settlement phase. What they discovered was early settlement places where small post-larval Napoleons transitioned from their planktonic phase and lived as very small juveniles amongst the inshore algal-coral beds. Camouflaged for their protection, it takes an expert to spot one, never mind identify if it's the right species. But this is what the fishers of these Indonesian islands have ingeniously managed to learn over the last two decades. They now know both the timing and the location where very small Napoleon fish arrive, and can collect large numbers of 2-3.5cm individuals over the short harvest period when the fish are inshore, that they then transfer to culture nets for grow-out. This is no small task as Napoleon fish are slow growing, taking 3-5 years to reach the preferred market size of 600g-1kg.

This form of early capture and culture, if practiced with care, could offer many

advantages over developing hatchery seed or taking larger adult or sub-adult stocks that are easily overfished. The potential benefits are greater than just ensuring there is a greater survival of juveniles that might otherwise perish, as the process also turns fishers into farmers, where the full life-cycle of the fish becomes important, as does the home of the Napoleon's early growth phase, the shallow water habitats. The knowledge gained by maintaining small fish in culture for 3-5 years also offers a range of development opportunities that involve fishers in a variety of alternative livelihoods. However, globally there is no CBA operation on marine reef fishes anywhere that has been demonstrably successful, so taking too many little fish is still a big risk. This initiative requires careful management, as we know very little of sustainable levels of catch of this early life history phase or even how quickly natural mortality declines after settlement.

So why were we called together to help set-up a management model for a fishery on early post-settlement larvae conducted only in two tiny island groups in Indonesia with local, national and international attendees? The reason is that there is little precedent for this type of situation for a CITES-listed marine finfish, one that blends conservation, fishery and aquaculture activity with lucrative international markets. This model, if it can be developed sustainably, offers much potential, in that it benefits remote fishing communities with few other opportunities to earn a cash income, let alone one derived from high value international exports. Additionally it facilitates development of further understanding and

possible recovery assistance for an endangered fish stock.

The reason this development supports recovery of the stocks is that the take and subsequent protection and culture of juveniles, if properly understood, and carefully managed within biologically sustainable limits, does not necessarily damage the flow of sufficient young fish through to adult size classes in the wild given the high death rate that usually occurs at this (very early juvenile-up to a few cm) bottle neck in the life history of fishes. This potentially creates a win-win situation with healthy wild stocks and the culture and sale of many fish, taken as early post-larvae and protected and nourished in captivity, that otherwise would very likely die. However, enormous challenges remain to make such a balance a reality. In the Anambas and Natuna islands, where collection of post-settlement larvae has been intensive and largely uncontrolled, wild adults, once abundant, are now rare, despite Napoleon habitats being part of National and Local Marine Conservation Areas. It will also be an enormous challenge for the community to control fishing activity to within the appropriated biologically sustainable limits. Still to consider is the source of the tiny Napoleons within the broader region, the level of mortality after juvenile capture and the high demand for fish feed to grow the fish up to market size.

Note:

The Indonesian Government, with help from International Union for the Conservation of Nature (IUCN) Groupers & Wrasses Specialist Group, the Food and Agriculture organization of the UN (FAO), Newcastle University, Hong Kong University and CITES assisted the fishers and aquaculture entrepreneurs.

While the potential is exciting, the biological and administrative challenges to balance the numbers taken for grow-out while leaving sufficient fish in the wild, and safeguarding the habitat of the species, are enormous.

By blending the capture, at sustainable levels, of small Napoleons from the wild with their grow-out to marketable sizes, and conserving habitat and healthy Napoleon populations in the wild, local Indonesian communities could potentially achieve what hasn't been done elsewhere in the world for reef fish. Hopefully Indonesia will be one of the first countries to turn round the fortunes of the Napoleons in their waters, while still receiving on-going commercial benefits.

The potentially great news story unfolding in Indonesia, is that the peoples' ingenuity, along with government support, might achieve both a conservation objective while lifting remote communities out of poverty at the same time. The government has initiated several measures including a research program and data collection framework linked to a developing 'national plan of action'. It also needs to develop an evidence based argument (non-detriment finding) to export Napoleons from Anambas and Natuna Islands legally. Much still needs to be done and there is a long way yet to go to achieve these aims. Let's all hope all these efforts restore Napoleons to their iconic position on Indonesia's reefs.