Chapter 38

Emblematic fish species as flagships of participative ecology?

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Reef manta rays *(Manta alfredi)* attract the public's attention because of their size (several meters wide), strange morphology and spectacular behavior. They are the most symbolic of species that promote environmental preservation. © IRD/G.Boussarie

Scientific research is receiving more and more media coverage. This provides ways of communicating the latest knowledge to decision-makers and the public, who can then develop an informed opinion. To reach as many people as possible, the information must be accessible and allow non-experts to understand complex systems such as coral reefs. Emblematic species enable this bridge between science, population and decision making.

To qualify as emblematic, a species has to meet one or more of the following conditions: perform an essential ecological function, be affected by disturbances, have a broad geographical distribution and have the potential to arouse media attention.

In reef fish, three main groups of species can be classified as emblematic. First, very large species such as sharks (chap. 37), large rays, giant groupers, Napoleon wrass or humphead parrotfish. These easy to identify species are all highly sensitive to disturbance, especially fishing, and many of them perform key ecological functions. The second group is made up of small, colorful, and easy to identify species, which are also sensitive to changes in the environment.

Examples include butterflyfish, angelfish and clownfish. The last group also includes species of great local cultural importance, such as short-nose unicornfish *(Naso unicornis)*, emperor red snapper *(Lutjanus sebae)*, emperors *(Lethrinus* spp.*)*, *mïkwaa or* milkfish *(Chanos chanos)* or rabbitfish *(Siganus lineatus)*. These different groups play different roles in our approach to environmental conservation.

The first group is the most mediatized. The spectacular nature of these species makes it is possible to raise public awareness about the ecological and societal challenges related to the maintenance of these species, which contributes to the preservation of their environment. In New Caledonia, it was possible to take measures to preserve the Napoleon wrass *(Cheilinus undulatus)* following an international awareness-raising campaign on this species, whose numbers are threatened in the most populated areas. Another species, which is more economically significant, the humphead parrotfish *(Bolbometopon muricatum)*, is still fished despite its acknowledged key role in the functioning of reefs.

The development of ecotourism has also made possible the in situ observation of species such as sharks, manta rays and giant groupers not far from the most populated zones of the territory. If these species were to experience a decline in numbers, it is likely that populations would be alerted and new protection or management actions would result. However, many of these fish species are concentrated in protected areas and their overall abundance may decrease without significant changes in the protected populations.

The second group is more accessible. It includes, for example, the butterflyfish which can be observed on all the reefs of the country. These fish are very sensitive to changes in their habitat. Butterflyfish are also very strongly linked to corals and this means that they can be used to detect changes in the quality of coral cover over the medium and long term, and they are often proposed as indicators of environmental conditions.

In addition, because of their diversity (34 species in New Caledonia) and because they can be identified easily, they are included in most participative science programs such as the Global Coral Reef Monitoring Network (GCRMN) and the RORC (New Caledonia Coral Reef Observation Network). Participative science has largely demonstrated its potential in terrestrial environments, but the complexity of reef ecosystems makes its application here more difficult.

The last group is relatively difficult to define because its composition is more variable. Most are species of longstanding economic or societal importance. In general, these species are medium to large in size and are an important part of the fish biomass. Before the arrival of Europeans, the capture, keeping or use of these species was often governed by complex rules. Examples include the short-nose unicornfish *(Naso unicornis)* on the island of Tiga, whose fishing was controlled by a set of customary rules, and the *mïkwaa* or milkfish *(Chanos chanos)* which is still ruled by community fisheries in several tribes. Species in this group are not listed anywhere but they are part of the local culture. Local populations would not remain unaffected by a significant decline in the number or size of species such as rabbitfish, large-eye seabream, lyretail grouper or mullet. Although there are ecological indicators based on the density and biomass of some of these species, these are not yet widely used in management strategies. However, the public's reaction to significant changes can lead to decision being made. For instance, the rarefaction of giant groupers *(Epinephelus coioides* and *E. malabaricus)*, followed by their sudden abundance after the discovery of their spawning grounds, generated reactions that led to regulations. Furthermore, the rarefaction of rabbitfish has also led to aquaculture trials.

To date, emblematic reef fish species have no specific status in New Caledonia, but consultations are ongoing. This is an opportunity to better define these species and introduce measures to protect them, to use them as indicators or specifically to preserve their population levels and quality. Most of these species are part of the country's cultural heritage, as are kagus, parakeets, Norfolk pines, kaoris or freshwater prawns. Beyond their preservation, they are an important means of communication and exchange between the public and decision-makers.

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