



## Session 05

## Changes in the fish assemblage structures of marine protected areas in West Africa: the case of a tropical estuarine MPA (Bamboung) and a coastal and marine MPA (Joal-Fadiouth)

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### Abstract

In the West African region, the marine protected areas 'MPAs' were primarily created with conservation objectives, to protect emblematic species and critical habitats. In the last ten years, their use as fishery management tools has also been advocated, particularly in Senegal. This study aims to assess the observed changes in the fish populations' structures in the years following fishing bans. The study is conducted in the MPAs of Bamboung and Joal-Fadiouth, in Senegal. We described and analysed the fish assemblage structures using the data from two years' experimental survey (2015-2016). In the Bamboung MPA, an increase of total fish biomass and of maximal fish length has been registered after the fishing ban. But over the 2004-2016 period, these indicators globally fluctuated. The contribution of marine affinity species has increased in depends of the estuarine part of the assemblage. In addition, the trophic structure has been modified with an overall increase of the mean trophic level, resulting from an increase of the percentage of generalist or piscivorous predators and a sharp decrease of herbivorous and detritivorous species feeding in the low trophic levels. Marine predators which abundance and size were reduced by fisheries were again important components in the Bamboung MPA. For the Joal-Fadiouth MPA, the fish biomass increased within the reserve with a dominance of small size fishes. This MPA led the conservation of certain species, but does not allow the proliferation of large size and high trophic level species. The results of the multivariate analysis showed an increase of abundance of the estuarine affinity species to the detriment of marine species. In addition, the low-trophic level species as herbivorous are more important in the reserve due to the high habitats diversity (mangroves, sandy and muddy bottom, algae) and the



fishing ban effects. In summary, we argue that the total ban on fishing in the estuarine area can significantly improve the fish assemblage for the fishing, and this is not evident for a coastal and marine area like Joal-Fadiouth MPA.

**Keywords:** Fish assemblage structures, MPAs impacts, Senegal.



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