

## Fish Tagging with Fishers and MPA staff to visibly demonstrate MPA benefits



**Problem:** Spillover from MPAs to fished reefs in Kenya has been strongly demonstrated with fishers working adjacent to MPAs catching larger and more lucrative fish (McClanahan et al 2005, 2012). However, despite data and data-based presentations on this finding to fishers (in annual Fishers Forums), most fishers do not perceive spillover benefits from MPAs (McClanahan et al 2005, 2012; O’Leary and Tuda unpublished data).

**Question:** Can including fishers in research using their own fishing gears help alter fisher perceptions of MPA benefits?

**Approach:** In July, 2014, we held a fisher meeting with 40 representatives from fisher groups surrounding the Mombasa National Marine Park and Reserve in Kenya. We surveyed fishers on marine and MPA knowledge and values, held a fisher-to-fisher training session on coral reef ecology, and worked with fishers on developing SMART objectives to improve self-management of fishing grounds. During this process, we introduced the idea of fish tagging as one method to measure potential MPA benefits from spillover, as part of a discussion of a variety of potential MPA benefits. Fishers were enthusiastic about conducting a fish tagging exercise jointly between fishers and the Kenya Wildlife Service (KWS, the agency that manages the national MPAs). We practiced tagging on dead fish and the fishers selected the target species (*Siganus sutor*, a rabbitfish that is their preferred catch species – that fortunately also has high movement rates).



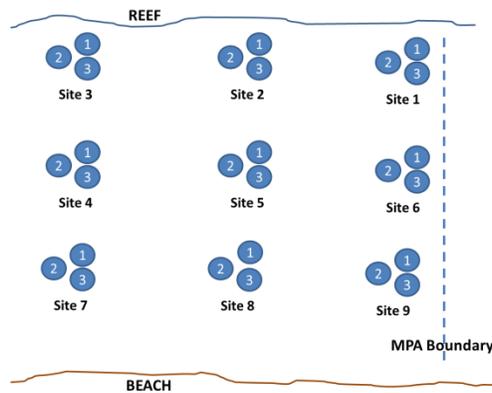
*Siganus sutor* with fish tag in the Mombasa MPA

In July-August, 2014, we used fisher-owned traditional basket traps in nine locations within the MPA (3 traps per location). Traps were placed at three distances from the MPA boundary (100 m inside the boundary, 0.5 km inside the boundary, and 1 km inside the boundary).



Fisher checking his basket trap in the MPA during fish tagging

For 3 days, 9 traps were baited (with algae and urchins) per day. Day 1 focused on sites 1-3, day 2 on sites 4-6, and day 3 on sites 7-9. All fish in traps were counted, measured, and weighed. We repeated this exercise for 3 additional days after a break of two weeks. All *Siganus sutor* were tagged using a numbered spaghetti tag, and every 10<sup>th</sup> fish tagged was double-tagged to assess tag loss rates.



Fishers agreed to return any tags found with length of fish as well as location and method of catch. Fishers also acknowledged that the return of a single fish would demonstrate some rate of spillover from the MPA to the fished reefs. In addition, fishers requested that we use the same approach (with the same distances from the MPA boundary) in the fished reefs to compare species and sizes caught). This is planned for September 2014, but will be done without fish tagging.

**Results:** We tagged a total of 196 *S. sutor*. In the 1-month since the tagging, we have not yet received any tag returns. However, our expectation is that within the next 6 months, we are likely to get 10-20 tag returns based on tagging studies done at another MPA in Kenya (Kaunda-Arara & McClanahan 2004). In six days of trapping, over 340 fish were tagged and weighed in the MPA from 24 species. Catch was dominated by *S. sutor*, the target of traps. This information will be compared with catches in the adjacent fished reefs.

Fishers and MPA staff felt that the field exercises were highly informative and increased collaboration between the management staff and fishers. As a result of the exercise, two fishers have joined in the MPAs monthly monitoring of beach and marine habitats, and these fishers are likely to recruit more. We expect that fisher attitudes toward the MPA and fisher knowledge of MPA benefits will increase due to this effort. Fishers will be re-convened in early 2015 and surveyed again for knowledge and attitudes.



*Fishers, MPA rangers, and KWS senior warden preparing to deploy fish traps in the Mombasa MPA*



*Measuring an *S. sutor* before tagging. Tag gun at right.*



*Other species were also measured and weighed*



*Two fishers looking at a tagged fish before releasing it*



*MPA rangers very excited about a large grouper in one trap*



*Fisher helps MPA warden with challenging fish ID by pointing to picture in fish ID book*



*Fish tagging team ultimately included fishers, MPA rangers, MPA wardens, the KWS assistant director, a KWS accountant, a KWS ticket seller, and scientists.*