Assessment of the South Coast spiny lobster stock: a case study

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Spiny Lobsters are the most valuable crustacean species found in Sri Lankan coastal waters. Over ninety five percent of the harvest is being exported to the foreign market. High exploitation rate due to the demand in the export market has resulted in the depletion of the stocks. At present, spiny lobster species are fully exploited. *P. polyphagus* species is completely harvested. The present case study focused on assessing the south coastal spiny lobster stocks and fishery with a view to implementing a fisheries co-management system for the Southern Coastal (Tangalle to Kumana) spiny lobster fishery. The bathymetry of the coastal area from Tangalle to Kumana (130 km), coast to 30 m depth, was mapped using a Garmin echo sounder. From this data the bathymetry was modelled using Map source, Ozi Explorer, 3D Analyst and Spatial analyst Extensions of Arc GIS 9.3 (ESRI) software. Two strata were derived: (1) Potential lobster habitat (43 km^2); and (2) marginal lobster habitat (875 km^2). Both habitats were surveyed during day and night time with the help of trained commercial divers. The Belt Transect method using 100 m x 2 m transects was used to sample lobsters. Collected data were used to estimate Standing Stocks. Maximum Sustainable Yield (MSY) was calculated with the theoretical rule-of-thumb model MSY = ½ $MB0$. It has been found that all the lobster species are overexploited. Lower 90% confidence interval of the standing stock was used to calculate the MSY. Due to the same reason, Total Allowable Catch was calculated as TAC= ½MSY.

The results of the present study indicated that the numerically dominant spiny lobster was *P. homarus* with an estimated standing stock of 349,688 individuals (100.3 MT) and TAC is 17,484 individuals or 5.0 MT. The second dominant species was found to be *P. versicolor*, with the standing stock at 259,216 individuals (73 MT) and TAC value of 12,961 individuals or 3.9 MT. TAC for all the species (without *P. ornatus*) was 11.7 MT. *P. homarus*, *P. longipes* and *P. versicolor* species were heavily concentrated in the Great basses and Little basses area. Those reefs act as nursery grounds for the Lobsters of the south coast.

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