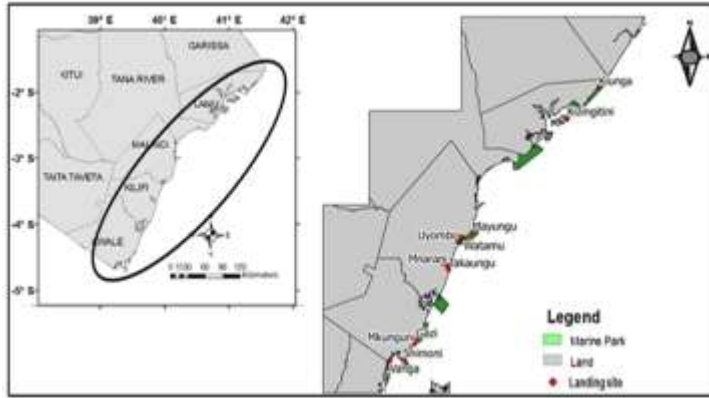
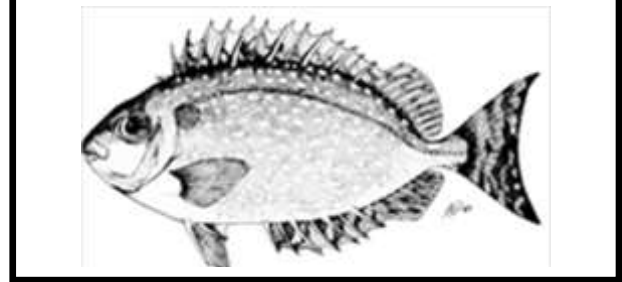


FACT SHEET

Stock Assessment of Rabbitfish (*Siganus sutor*) along the Kenya coast

Fishery description

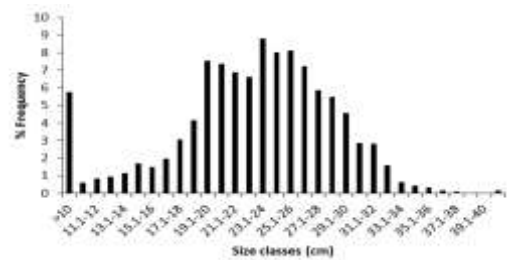
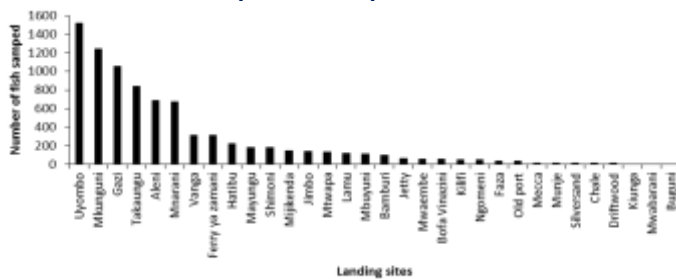
The shoemaker spinefoot - *Siganus sutor* belongs to an economically core group of herbivorous fishes in the family Siganidae. Siganids are cosmopolitan demersal fishes commonly found in the Indo-Pacific, Red Sea and Eastern Mediterranean regions inhabiting shallow inshore reefs, within sea grass beds. They are among the most common species in the marine fisheries of Kenya accounting for ~180 t (11%) of the artisanal fishery landings. Five other species also recorded in Kenya are: *S. stellatus*, *S. rivulatus*, *S. luridus*, *S. canaliculatus*, and *S. argenteus*. Various fishing gears are used to target the siganids, with basket traps being the preferred gear, especially in south coast Kenya where the fishery is dominant.



Geographic extent

Fishery assessment and sampling were conducted along the entire Kenya coastline from Vanga in the south to Ishakani in the north, at 16 selected sites: Gazi, Vanga, Jimbo, Shimoni, Munje, Mwaembe, Mkunguni and Mwandamo in the south coast Kwale County; Mayungu, Uyombo, Takaungu, Bofa, Mnarani in Kilifi County and Faza, Kizingitini and Kiunga in the north Lamu County.

Species composition



Abundance of *S. sutor* by fish landing sites sampled along the Kenya coast

Size frequency of *S. sutor* sampled individuals

Results

On average Lamu County lands more fish per vessel in a day than other countries.

Gear type	Catch per unit effort CPUE (kg vessel ⁻¹ day ⁻¹)
Lamu	39.25 ± 4.47
Kilifi	6.40 ± 1.86
Mombasa	8.81 ± 2.26
Kwale	9.41 ± 2.93

Annual catches of Siganids from Catch Assessment Survey 2014)

County	Annual landing (kg year ⁻¹)
Lamu	482,873.99
Kilifi	446,339.43
Mombasa	186,886.71
Kwale	535,300.69

Economic value

Overall total annual catch of *Siganus sutor* is 1651 t with a current market value of between US\$ 4,201,778.105 annually (KES. 424,337,570.8) US\$ Exchange rate: USD 1 = 100.99 as at May 2016.

Stock status of the Siganid fishery (Performance indicators (stock indicators and reference points))

- In the analysis of the Yield-per Recruit (Y/R) and Spawning Stock Biomass (SBB) against the virgin fishable biomass FishB₀ spawning biomass (SSB₀), the current fishing mortality (F_{CURR}) was estimated at 1.8 which yields Y/R of 24.5% of FishB₀ and a SSB of 4.3% of the SSB₀
- At the same time, the fishing mortality at maximum Y/R (F_{MSY}) is 0.9 (equivalent to 24.6% of the fishable biomass FishB₀ and a spawning biomass of 14.2 % of the SSB₀) suggesting that the siganid fishery is undergoing overfishing.
- To maintain the SSB at a safe-level of above 20% of the SSB₀, the current fishing mortality is high and should be lowered to an optimal fishing mortality (F_{OPT}=0.7) which yields a Y/R of 24.2% of the FishB₀; higher than the current Y/R of 21% but at <50% the current fishing mortality F_{CURR} = 1.8.
- The spawning biomass should be maintained at SSB_{TARGET}= 4,910.5 Mt with a limit at SSB_{LIMIT}= 3,928 Mt
- Currently all sizes of fish are caught. The sustainable sizes should be over 18 cm

What is the current stock status of *S. sutor*?

Exploitation parameter	<i>S. sutor</i>
Annual catch	1651 t
SSB _{MSY}	2,227 t (11.9%)
SSB _{CURRENT}	825 t (4.2%)
SSB ₀	1000 t
F _{MSY}	1.1
Fishing mortality	1.86
Mean size (L _c)	1.5 cm
Size at first maturity (L ₅₀)	28.2 cm
Size ranges	1.5 to 45 cm
Weight ranges	9 g to 750 g
Total mortality (Z)	2.75

Existing Management Regulations/ Plans

- Currently no management plan is in place.
- Monitoring by Wildlife Conservation Society, Kenya Marine and Fisheries Research Institute and State Department of Fisheries to promote modification of the basket trap by adding an escape gap which helps reduce by-catch by allowing juveniles and small-sized fish to swim out of the trap.

Management Recommendations

- Reduce fishing mortality from 1.8 to above 1, a decrease of about 59%
- Promote modification of traditional basket traps to reduce by-catch and harvesting of juveniles

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