



The Blue Swimming Crab Bulletin No.11

The Sri Lankan blue swimming crab fishery improvement project (FIP) was initiated by the National Fisheries Institute Crab Council and the Seafood Exporters' Association of Sri Lanka in May 2013 and officially launched by the Minister of Fisheries and Aquatic Resources Development in November of the same year. The FIP is a tripartite initiative that brings together fishermen, seafood companies and government agencies to improve the biological and ecological status and the management of the fisheries in the Palk Bay and the Gulf of Mannar to a level equivalent to a sustainably managed fishery: now and in the future. The FIP also works to ensure that Sri Lankan blue swimming crab supply chains are equitable and responsible. The fisheries are the **only** fisheries in Sri Lanka and the **only** BSC fisheries in South and Southeast Asia to be eco-recommended (**GOOD ALTERNATIVE**) by the Monterey Bay Aquarium Seafood Watch programme.



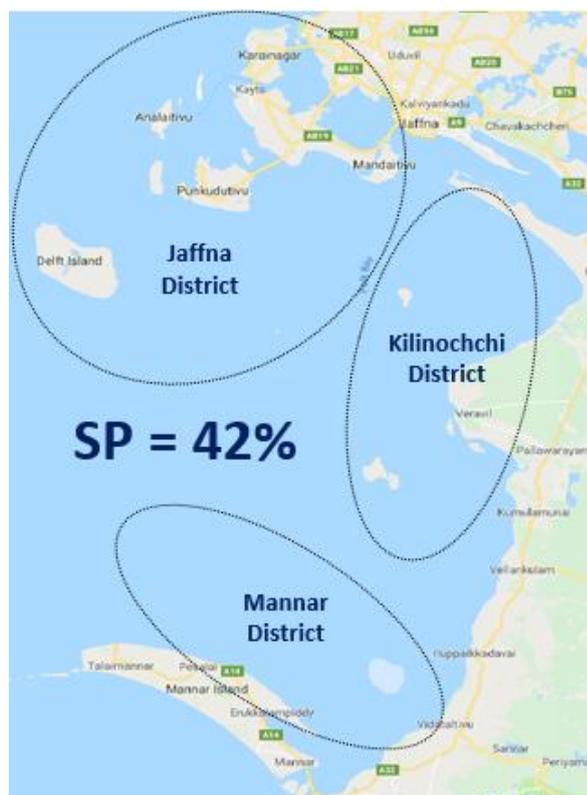
Improving the biological status of the BSC stocks



The 5th annual assessment of the status of BSC stocks in the Palk Bay and in the Gulf of Mannar was implemented by pelagikos pvt ltd between 3rd March and 15th July 2019. The stock assessment was conducted in collaboration with fishing communities and seafood companies in Jaffna, Kilinochchi, Mannar and Puttalam districts. The stock assessment was supervised by Fishery Inspectors (FIs) from the District Fisheries Offices (DFO) of the Department of Fisheries & Aquatic Resources (DFAR) in each district. Stock status was assessed using a length based approach to (estimating) spawning potential ratio (LBSPR). The LBSPR app is freely available in the Barefoot Ecologist's [Toolbox](#).

2019 Palk Bay Assessment: 8,768 female crabs were measured from 19 landing centres located in the three districts that border the Palk Bay fishery. The average size (carapace width) of the crabs measured in the Palk Bay fishery was 132 mm. The crabs ranged in size from 79 mm to 204 mm. 87% of the crabs sampled were mature. 7% of the crabs sampled were immature. 6% of the sample was infected with the parasitic barnacle Sacculinidae (Rhizocephala).

The result of the 2019 LBSPR assessment (SP = 42%) suggest that the status of the BSC stock in the Palk Bay continues to be maintained above the Target Reference Point (TRP) for fishery (TRP = 30% Spawning Potential). The results in 2019 are consistent with the LBSPR results over the past four years, suggesting that the BSC fishery in the Palk Bay has been and continues to operate at a level equivalent with a *sustainably managed fishery*.



Lower TRP	2015	2016	2017	2018	2019
30%	32%	44%	47%	45%	42%

Gulf of Mannar Assessment 2019: 4,532 female crabs were measured from 14 landing centres located in the two districts that border the Gulf of Mannar fishery. The average size (carapace width) of the crabs measured in the fishery was 140 mm. The crabs ranged in size from 90 mm to 205 mm. 92% of the crabs sampled in the Gulf of Mannar fishery were mature. 7% of the crabs sampled were immature. 1% of the crabs sample was infected with the parasitic barnacle Sacculinidae.

The result of the 2019 LBSPR assessment (SP = 57) suggest that the status of the BSC stock in the Gulf of Mannar continues to be maintained above the Target Reference Point (TRP) for fishery (TRP = 30% Spawning Potential). The results of the 2019 assessment are consistent with the LBSPR results over the past four years, suggesting that the fishery in the Gulf of Mannar has been and continues to operate at a level equivalent with *a sustainably managed fishery*.

Lower TRP	2015	2016	2017	2018	2019
30%	31%	46%	41%	37%	57%



Improvements to the biological status of the stocks were co-financed by the National Fisheries Institute Crab Council and the Taprobane Seafood Group Pvt Ltd

Improving the ecological status of the fisheries

Ecological impacts on non-target species: The FIP continued to receive support from researchers to collect information and data about the ecological impact of the bottom-set crab net fishery on non-target species (NTS) in the Palk Bay and the Gulf of Mannar fisheries in the first half of 2019.



Hasamini Thilakarathne an undergraduate student from Ocean University researched the ecological impact of bottom-set crab nets on NTS at Sinnakudirippu landing centres in Kalpitiya (Puttalam District / Gulf of Mannar fishery), for her final year dissertation in 2018/19. *Hasamini* sampled 141 crab catches with a total weight of 1.34 tons. 58 NTS were observed including finfish (31), crustaceans (09), molluscs (15), echinoderms (02) and cnidarians (01). 82% of the catch by weight was retained (BSC 50% / non-target species 32%), while the balance (18%) was discarded. No endangered, threatened or protected species (ETP), Out of Scope or Primary NTS were present in the catch.



Subaha Vijayakumaran an undergraduate student from Uva Wellessa University researched the ecological impact of bottom-set crab nets on NTS at Thooriayoor landing centre in Velenae DS Division (Jaffna District / Palk Bay fishery) for her final year dissertation in 2018/19. *Subaha* sampled 153 crab catches with a total weight of 1.27 tons. 84 NTS were observed including finfish (32), crustaceans (23), molluscs (18), echinoderms (09) and cnidarians (02). 85% of the catch by weight was retained (BSC 45% / non-target species 40%), while the balance (15%) was discarded. No endangered, threatened or protected species (ETP) or Out of Scope were present in the catch. One Primary NTS was observed.

The pale-edged stingray (*Telatrygon zugei*) is one of the most common NTS observed in the catch from the bottom-set nets used by fishermen to harvest BSC in the two fisheries. The pale-edged stingray is rated **'Near Threatened'** on the International Union for Conservation of Nature's Red List¹, even though there is no scientific data (e.g. age at maturity, longevity, average reproductive age, gestation time, reproductive periodicity, average annual fecundity, annual rate of population increase, natural mortality, growth rate, fishing mortality and population trend) to support this rating across any of its range. The species' distribution extends from the east coast of India throughout the Bay of Bengal and South East Asia to Japan. In Sri Lanka the pale-edged stingray is targeted by Sri Lankan fishermen in the Gulf of Mannar and Palk Bay using 5½" and 6" bottom-set nets. These nets also catch BSC.



Dilukshani Gayathry, also an undergraduate student from Uva Wellessa University, researched the stock status and size on maturity of the pale-edged stingray (*Dasyatis zugei*) at Thaluppadu landing centre in Mannar Town DS Division (Mannar District / Gulf of Mannar fishery) for her final year dissertation in 2018/19. Dilukshani sampled 1,404 pale-edged stingrays from the landings of BSC fishermen. 57% of the samples were female. Female disc width ranged from 93 mm to 260 mm. The average size was 172 mm. Size at first maturity was 164.3 mm. 95% of females were mature at 194.3 mm. The maximum fecundity observed was three embryos. Embryo size ranged from 57 mm to 75 mm.



In March *Subaha* and *Dilukshani* joined pelagikos pvt ltd as research assistance to continue and complete researching the ecological impact of bottom-set crab nets on NTS species and in the Palk Bay and Gulf of Mannar fisheries. Together with *Jeewantha Bandara* they completed a two more NTS studies in the Palk Bay fishery (Chettipalam and Velaipaddu) and four studies in the Gulf of Mannar fishery (Thalupaddu, Vankalai, Baththalangunderuwa and Pookulam). One final study will be completed in the Palk Bay fishery (Karainagar) in August 2019. Once these studies are completed the FIP's 2017 ecological impact assessment report on NTS in each fishery will be updated and published.

Ecological impacts on marine habitats

Technical reports describing the ecological impact of the BSC fishery on marine habitats in the Palk Bay and the Gulf of Mannar were updated in March. There was no change in the overall findings (see right), which suggest that the ecological impact of bottom-set crab net fishing on marine habit in both fisheries is low for critical marine habitats such as mangroves, sea grass beds, limestone and coral reefs.

	Palk Bay (ha)			Gulf of Mannar (ha)		
	Total	Impact?	%	Total	Impact?	%
Mangroves	6,732	1	0.0%	1,919	-	0.7%
Seagrass	88,524	10,962	12.4%	68,452	9,364	13.7%
Limestone Reefs	16	0	0.0%	6,001	181	3.0%
Coral Reefs	7,235	69	1.0%	2,598	190	7.3
Marine Habitats	102,507	11,031	10.8%	78,970	9,735	12.3%

Improvements to the ecological status of the fishery co-financed by the National Fisheries Institute Crab Council with technical assistance from Ocean University and Uva Wellessa University

¹ <https://www.iucnredlist.org/species/60160/104082989>

Improving the management of the fisheries

Fisheries Inspector Division Meetings: The current status of the fisheries, the progress of the FIP and future plans and the key issues that need to be addressed to further improve the fisheries were presented / discussed with representatives of BSC fishing communities through a series of Fisheries Inspector Division (FID) meetings convened by the DFAR's DFO during the first quarter of 2019. Representatives of more than 60 Fishermen's Cooperative Societies participated in 17 meetings held in the four districts bordering the two fisheries.



The FIP's proposal to introduce a regulation for BSC fishing and a schedule for exporters was endorsed by BSC fishing communities in both fisheries. The proposal to declare 'district level' Fishery Management Areas was also supported by BSC fishermen. According to fishermen the following key issues need to be addressed by the FIP in 2019/20. (1) Catching and purchasing very small crabs (< 99 g / < 119 mm); (2) Different grading practices and pricing issues within and between the two fisheries; (3) Illegal, unreported and unregulated (IUU) fishing by Tamil Nadu trawlers in Sri Lankan waters and (4) Illegal trawl net fishing by Sri Lankan boat owners in the fishing grounds of BSC fishermen in both fisheries.

Improvements to the management of the BSC were co-financed by the National Fisheries Institute Crab Council with management assistance from the District Fisheries offices of the DFAR

Improving economic equity and social responsibility

Economic Equity: Beach prices for BSC remained stable during the first six months of 2019. Six months after achieving the Seafood Watch **GOOD ALTERNATIVE** rating, there has yet to be any evidence of a 'price premium' associated with the Seafood Watch eco-recommendation as a result of Sri Lankan BSC products accessing global markets for eco-recommended / certified sustainably sourced seafood.

Social Responsibility: The FIP began exploring options to recycle BSC fishing nets at the beginning of the year. A local solution to discarded plastic crab nets is available, but more research is needed to recycle nylon nets in Sri Lanka. The FIP plans to begin a pilot programme to recycle plastic nets with fishing communities and work with companies to find a local solution to nylon net recycling in the second half of 2019/20.

Improvements to social responsibility and economic equity in the fishery and supply chains for Sri Lanka BSC were co-financed by the National Fisheries Institute Crab Council

The Seafood Exporters' Association of Sri Lanka (SEASL) and other members of the FIP are grateful to the National Fisheries Institute Crab Council (NFI CC) for its continuous and generous support of the FIP since 2013.

Members of the FIP are also grateful to Taprobane Seafood Pvt Ltd, Uva Wellessa University and Ocean University for investing / supporting in one or more of the sub projects described in this edition of the Sri Lankan **Blue Swimming Crab Bulletin**.



Soft copies of all nine editions of the Blue Swimming Crab Bulletin are available in English, Sinhala and Tamil. To request copies please email steve@pelaqikos.lk