



# The Blue Swimming Crab Bulletin No.3

January to June 2015

Welcome to the third edition of the Seafood Exporters' Association of Sri Lanka's (SEASL) *Blue Swimming Crab Bulletin*. It's been another hectic six months, improving the Sri Lankan blue swimming crab (SLBSC) fishery. Two stock assessments were completed by the Poonaryn Fishermen's Cooperative Society Union (FCSU). The National Aquatic Resources Research and Development Agency (NARA) continued to study the population biology of the SLBSC fishery. Students from Uva Wellasa University joined the fishery improvement project (FIP) and the Department of Fisheries and Aquatic Resources (DFAR) commenced a study of fishing effort in all four major SLBSC fishing grounds. Details of all these activities and more can be found in this edition of the *Blue Swimming Crab Bulletin*. The bulletin has also been 'improved'. The new layout better reflects the key concerns assessed by international protocols for sustainable fisheries.

## Improving the biological status of the stock

Understanding the biological status of BSC stock(s) in Sri Lanka is a crucial first step to improving the sustainability of the fishery. At the end of last year the FIP completed an assessment of the BSC stock in the Gulf of Mannar (Puttalam Lagoon), using a length based spawning potential (LB SP) methodology. In February and March, the Poonaryn FCSU completed two more LB SP assessments for SLBSC fishing grounds off the coast of Kilinochchi and Mannar in the Palk Bay (Bay of Bengal). Technical assistance was provided by SEASL. Data describing the LB SP of blue swimming off the coast of Jaffna in the Palk Bay continues to be collected by NARA (see table below and overleaf).



**What's the Catch?** (see right) is a free LB SP assessment software application developed to assist the assessment and management of data deficient fisheries. *What's the Catch?* was used to analyse the LB SP data collected in the Gulf of Mannar (Puttalam Lagoon) and the Bay of Bengal (Palk Bay) in 2014/15, by fishing communities, SEASL and NARA. *What's the Catch?* is an evolving product of more than 20 years of LB SP scientific research by Dr. Dr. Jeremy Prince and his colleagues at the Centre for Fisheries and Fisheries Research at [Murdoch University](http://www.murdoch.edu.au), in Western Australia.

Provisional results for the spawning potential ratio (SPR<sup>1</sup>) with confidence limits (CL), for SLBSC stock(s) in the Gulf of Mannar and the Bay of Bengal indicate that the status of the stock(s) is currently sustainable (see right and overleaf). The analyses were generated using estimates for key life history parameters for the SLBSC (*i.e.*,  $M/k = 1.5$ ;  $L_{50} = 95$  mm;  $L_{95} = 135$ ;  $L_{inf} = 170$  mm and  $\beta = 3$ ). These estimates are based on a review of the scientific literature on the life history of BSC in South and South East Asia and Australia and recommendations from Dr. Adrian Hordyck ([Murdoch University](http://www.murdoch.edu.au)) on appropriate life history parameters for BSC.

SLBSC Stock(s)	Crabs	SP	CL
<b>Gulf of Mannar</b>			
<i>Puttalam Lagoon</i>	3,115	59%	2.2%
<b>Bay of Bengal</b>			
<i>Mannar</i>	2,015	39%	0.8%
<i>Kilinochchi</i>	4,087	54%	0.4%
<i>Jaffna</i>	5,902	61%	0.4%

<sup>1</sup> The spawning potential ratio (SPR) is defined as the proportion of the unfished reproductive potential left at a given level of fishing pressure. This is multiplied by 100 to give a percentage value for SP e.g., 40%

Reference Points	Generic SPR Values
Limit Reference Point	20%
Lower (Target) MSY	30%
Upper (Target) MSY	40%
Precautionary MSY / MEY	50%
Precautionary / Rebuild SPR	60%

The SPR for SLBSC in the Gulf of Mannar and Bay of Bengal will be recalculated using actual values for key life history parameters for the SLBSC, once NARA completes the scientific study of the population biology of the SLBSC (see below). In the meantime, the provisional results of the LB SP assessment provide the FIP with a better understanding of the biological status of SLBSC stocks, when compared to generic SPR values for key Reference Points for sustainable fisheries<sup>2</sup> (see right). The provisional SPR for SLSBC in the Gulf of Mannar and for two of the three landing centres in the Bay of Bengal is currently above the precautionary MSY / maximum economic yield. The SPR for SLBSC fishing grounds in Mannar (39%) is at

or just below the Upper (Target) maximum sustainable yield (40%).



Between January and June this year, Dr. Sisira Haputhanthri (see left), Principal Scientist, Marine Resources Management Division (MRMD) of NARA and his staff sampled over 18,000 crabs from four fish fishing villages in Jaffna District. More than 400 crabs were taken back to the laboratory for further analysis. Key population biology parameters that are being measured by Dr. Haputhanthri include the length / weight relationship; growth; mortality; size on maturity; fecundity; spawning seasonality; LB SPPR and diet. NARA submitted an interim Progress Report to SEASL in June 2015. The final Research Report describing the population and fishery biology of the SLSBC will be submitted on or before the 31<sup>st</sup> December 2015.

In June, Ayantha Abeygunawardana, a final year student from the Uva Wellasa University started a three month study of the reproductive biology of the SLBSC in Mannar District (see right). Ms. Abeygunawardana is being supervised by Dr. Sepalika Jayamanne, Dean of the Faculty of Animal Science and Export Agriculture at Uva Wellasa



University. The SLBSC fishery improvement project provided Ms. Abeygunawardana with a research stipend to cover the cost of travel, accommodation, food and research materials.

## Improving the ecological status of the fishery

International organisations and agencies at the forefront of driving fishery improvements projects towards sustainable fisheries, such as the Monterey Bay Aquarium's Seafood Watch (SFW) and the Marine Stewardship Council (MSC), assess the ecological status of a fishery at three levels. Firstly they look at a fishery's impact on non target species (*i.e.*, bycatch). Secondly they assess a fishery's impact on marine habitats (*e.g.*, mangroves, coral reefs and sea grass beds). Finally they assess a fishery's impact on the marine ecosystem.

In May the FIP started drafting plans to research the ecological impact of the SLBSC fishery. The FIP met staff and final year students at the Faculty of Animal Science and Export Agriculture at Uva Wellasa University (Badulla). The FIP also travelled to Tangalle to make a short presentation about the SLBSC FIP to staff and final year students at the Ocean University. These presentations and the discussions that followed were intended to encourage staff and final year students to conduct research in support of one or more aspects of the SLBSC fishery improvement project, including the ecological status of the fishery.



<sup>2</sup> J. Prince (2014) Report on a SPR@Size assessment of the blue swimmer crab fishery in Southeast Sulawesi. IMACS, USAID. Oct. 2014 pp. 30



Wathsala Dolawaththa a final year student from the Uva Wellasa University commenced his final year research project on the impact of the SLBSC fishery on non target species in Mannar District in June 2015 (see right with NFI CC's Jeremy Crawford). Wathsala is also being supervised by Dr. Sepalika Jayamanne, Dean of the Faculty of Animal Science and Export Agriculture at Uva Wellasa University.



In August Eranga Gunasekera, a final year student at the Ocean University will begin research into the impact of the SLBSC fishery on non target species in the Gulf of Mannar (Puttalam Lagoon). Eranga will be supervised Dr. M. M. Fairoz, Senior Lecturer, Faculty of Fisheries and Marine Science at Ocean University. The SEASL is extremely grateful to each of these students and their supervisors for supporting the FIP. The FIP will continue to encourage graduate and post graduate students and university staff to

undertake research on all aspects of the SLSBC fishery over the next two years.

## Improving the management of the SLBSC fishery

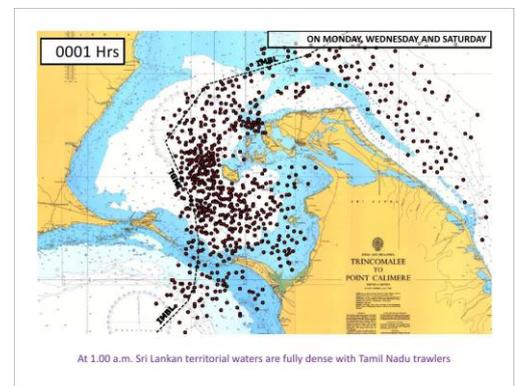
The FIP needs to design and implement a harvest control strategy, with simple and effective rules and tools, to ensure that the biological status of the SLBSC continues to be 'sustainable'. A new regulation specific to the SLBSC fishery may be needed, together with a consultative co-management framework through which to implement the harvest control tools. Ideally this framework should combine the knowledge, experience and capabilities of fishing communities, manufacturers and government authorities, to provide effective management of factors that affect the biological and ecological sustainability of the fishery.

Fishery	Fishermen	Landing Centres	Fishing Craft
<b>Gulf of Mannar</b>			
Puttalam	1,744	35	1,027
<b>Bay of Bengal</b>			
Mannar	1738	17	603
Kilinochchi	310	6	155
Jaffna	432	19	696
	<b>4,224</b>	<b>77</b>	<b>2,481</b>

In June officers and staff of the DFAR commenced implementation of an effort survey in the SLBSC fishery. The survey is co-financed by the Bay of Bengal Large Marine Ecosystem ([BOBLME](#)). Technical assistance is being provided by Mr. Leslie Joseph, senior consultant to the DFAR. A survey questionnaire was drafted and discussed with the FIP. Thereafter plans were drawn up to complete the survey with 77 BSC fishing communities in four districts (see targets right). Based on the survey results, DFAR and other members of the FIP will formulate a draft fishery management plan, with technical assistance from Dr. Sewandi

Jayakody at the University of Wyamba. The draft fishery management plan will be developed using BOBLME's eco-system approach to fisheries management.

Persistent illegal fishing by Tamil Nadu trawlers in SLSBC fishing grounds in northern Sri Lanka is one of the biggest external challenges facing the FIP's efforts to improve the SLBSC fishery. Three times each week more than 700 Tamil Nadu trawlers cross the International Maritime Boundary Line that separates Sri Lanka and India in the Bay of Bengal, to fish illegally in Sri Lankan waters (see RADAR image right). Despite diplomatic efforts by the governments of Sri Lanka and India, the State Government of Tamil Nadu has so far failed to take any initiatives or measures to stop illegal fishing by Tamil Nadu trawlers in Sri Lankan waters.



Illegal fishing by Tamil Nadu trawlers in Sri Lankan waters deprives northern fishermen of access to their fishing grounds for three nights each week. It denies northern fishermen and Sri Lankan seafood companies the right to harvest / export thousands of tonnes of prawns, sea cucumbers, crabs, cuttlefish and fish every year and also damages or destroys key marine habitats. Illegal fishing by Tamil Nadu trawlers in Sri Lankan waters is a major threat to the sustainability of the SLBSC fishery.

In March, Mr. Chandaka Jayasundere (Attorney at Law) with Chinthaka Fernando and Vishmi Fernando, instructed by Mr. K. Upendra Gunasekara (Attorney at Law) filed a petition in the Court of Appeal on behalf of northern fishermen. The petition sought the court's consideration of the legal action taken by the Attorney General's Department in respect of illegal fishing in Sri Lankan waters by Tamil Nadu trawlers. Unfortunately the court rejected the fishermen's petition. The fishermen have appealed to the Supreme Court. The appeal will be heard on the 10<sup>th</sup> July.



Illegal fishing by Sri Lankan trawlers is a further threat to the SLBSC fishery. Sri Lankan trawler owners have taken advantage of the 'three day fishing ban' enforced by Tamil Nadu trawlers in Sri Lankan waters, to start operating trawl nets illegally in coastal waters. The operation of non mechanised and mechanised trawls is proscribed in estuaries and lagoons in Sri Lanka under Section 4 of the Inland Fisheries Management Regulations of 1996. In April 2015, the Honourable M. A. Sumanthiran (MP) proposed an amendment to the Fisheries and Aquatic Resources Act, based on research by Verité Research. The amendment seeks to proscribe mechanised trawling by Sri Lankan vessels in coastal waters.

In June, five of the Sri Lanka's leading crab manufacturers – **Taprobane Seafood, Alpex Marine, Prawn Ceylon, Ceylon Catch** and **P N Fernando** – launched a petition asking the Minister of Fisheries and Aquatic Resources to take stronger action to deter Tamil Nadu and Sri Lankan trawlers from fishing illegally in Sri Lankan waters. The petition will be handed over to the new minister, after the general elections on 17<sup>th</sup> August 2015. Also in June, M. B. Sosai a final year student from the Uva Wellasa University commenced a field study of the impacts of Tamil Nadu trawlers on traditional fisheries in Mannar District. Mr. Sosai is being supervised by Mr. Nuwan Liyanage, Research Coordinator, Faculty of Animal Science and Export Agriculture at Uva Wellasa University.



In March the SEASL welcomed Cassie Leisk (MSC's Engagement Officer for Fishery Improvement Projects) to Sri Lanka. Cassie ran a two day programme on eco-labelling, MSC certification and the MSC's Fishery Standard.

Thirty representatives from leading seafood companies, together with officers and staff from DFAR and NARA, as well as university academics and students participated in the programme. The programme included practical demonstration of MSC's Risk Based Framework, to assess the ecological impacts of the SLBSC fishery.



**Moving the FIP forwards in 2015:** The improvements to the SLBSC fishery described above would not have been possible without financial and technical support received from the National Fisheries Institute Crab Council (SEASL core funding). The International Labour Organisation's Local Empowerment through Economic Development project (with Kilinochchi FCSU) and the Bay of Bengal Large Marine Ecosystem programme (with DFAR) have also contributed generously to the successful implementation of the FIP. The members of the FIP are deeply grateful to each of these organisations and their staff for their support and assistance to improve the SLBSC fishery. The members of the FIP look forward to continuing to work with the NFI CC, the LEED project and BOBLME to further improve the SLBSC fishery.



Soft copies of the Blue Swimming Crab Bulletin (Nos. 1, 2 and 3) in English, Sinhala and Tamil and key FIP documents (i.e., design, work plans, budgets and performance monitoring) will be available on the SEASL website ([www.seasl.lk](http://www.seasl.lk)) by the end of August 2015. For further details and or any clarifications about the SLBSC fishery improvement project please email [oddfish@slt.lk](mailto:oddfish@slt.lk)