

Minimum Legal Size proposed for commercially exploited marine finfish and shellfish resources of Tamil Nadu

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Marine fisheries in Tamil Nadu have undergone tremendous change in terms of fishing pattern, fishing method, extension of fishing grounds, composition of fish catch and consequent increase in the total fish catch in recent years. The recent demand from industries involved in fish meal and fish oil encourages targeted fishing for by-catch resulting in heavy landing of low value by-catch in certain places along Tamil Nadu coast. These by-catch are often dominated by juveniles of many commercially important marine finfishes and shell fishes. So it warrants some caution and intervention. One of the methods to discourage the indiscriminate exploitation of juveniles is to impose a Minimum Legal Size (MLS) which is the size at which a particular species can be legally retained if caught. The advantage of a MLS is that it aids in the control of two major problems in the fisheries management, growth overfishing and recruitment overfishing either by increasing the minimum size of harvest or by increasing or maintaining the size of the spawning stock. The most common method of increasing the reproductive output through the use of size limits is to set the minimum size at which the females become sexually mature. As the individuals of a species do not attain sexual maturity at the same size, it can be a size at which higher proportions are mature. The greater the minimum size, the more protection it offers the spawning stock. In that way, size at first maturity is more useful. It is also given that if the ratio of minimum size for trade to the size at first maturity is more than 1.1, the stock is said to be at low risk. This also means a favorable condition

to the stock if the minimum size permitted for trade is more than the size at first maturity (SFM). Notwithstanding this, any minimum size -even one that is set below the minimum spawning size - will increase the proportion of animals surviving to spawning size provided that the size protected would otherwise have formed part of the retained catch. Thus the MLS does not necessarily have to be the size at which animals spawn, although the closer it is to this size, the more effective it becomes (Hill, 1990, Key note Address : Minimum Legal Sizes and their use in management of Australian fisheries, *Bureau of Rural Resources Proceedings* No. 13; 9-18). Among marine states of India, Kerala has already implemented the rules for MLS with reference to 58 species and Karnataka is in the process of implementing the same.

In the present study, different parameters like size at sex differentiation (SSD), minimum size of sexual maturity (MSM), size at 50 % maturity (SFM) were selected for different species based on their biological characteristics. The studies conducted on the biology of different resources from Tamil Nadu during the period 2012-16 along with the MLS already given for Kerala (Mohamed *et al.* 2014, *Mar. Fish. Infor. Serv., T&E Ser., 220 : 3-7* and Karnataka (Rohit *et al.*, 2016 *Marine Fisheries Policy Series* No. 5, ICAR-CMFRI 110 p.) form the base of this report. Extension of fishing beyond territorial waters and often into the waters of other states necessitates more or less similar MLS all along India. Otherwise there are chances that the sizes that are

illegal in one state can be legal in the adjacent state resulting in clandestine deals. Moreover the growth and maturity of many resources are found to be almost same from different areas. Considering these reasons, the legal sizes found out for Kerala and Karnataka are retained for Tamil Nadu along

Table 1. Decision logic

Criteria	Explanation	Logic
SSD	Size at sexual differentiation into male and female	This metric can be used to prevent juvenile exploitation and growth overfishing in those stocks which are very abundant, have high reproductive potential and whose biomasses are not affected by high fishing pressure
MSM	Minimum size at maturity or the smallest mature fish	This metric can be used to prevent growth overfishing in stocks which are moderately resilient to fishing pressure
SFM / WFM	Size (or weight) at first maturity or Size / weight at 50 % maturity	Conventionally used as a metric to prevent growth overfishing completely and recruitment overfishing partially. Can be used in situations where the stock is depleted or rebuilding

with other resources studied from here. The decision logic for various parameters and MLS thus proposed are given in Tables 1 and 2. The catch can be considered as violation if only more than 50 % of the catch is below the MLS. Inspection of the catch may be done either at sea or at the landing centre taking an unsorted catch.

Table 2. Minimum Legal size of commercially important species

Sl. No.	Species /Stock	Common name	Local name	MLS (cm)	Decision Logic
Major pelagic fish stocks					
1	<i>Sardinella gibbosa</i> *	Goldstripe sardinella	Chala,Kavalai	10TL	MSM
2	<i>Sardinella albella</i> *	White sardinella	Thatta kavalai,Choodai	10TL	MSM
3	<i>Sardinella fimbriata</i> *	Fringescale sardinella	Nedumkavalai,Choodai	11TL	MSM
4	<i>Sardinella longiceps</i>	Oil sardine	Mathi,Peychalai	10TL	SSD
5	<i>Amblygaster sirm</i> *	Spotted sardinella	Keerimeen chalai,Varikavalai	11TL	MSM
6	<i>Escualosa thoracata</i>	White sardine	Mattakolunthan, Mutlasse	9TL	MSM
7	<i>Stolephorus indicus</i> *	Indian anchovy	Nethili	10TL	MSM
8	<i>Stolephorus waitei</i>	Spot faced anchovy	Nethili	7TL	MSM
9	<i>Encrasicholina devisi</i>	Devis' anchovy	Nethili	7TL	MSM
10	<i>Rastrelliger kanagurta</i>	Indian mackerel	Kanangeluthi,Kumla,Ayila	14 TL	MSM
11	<i>Trichiurus lepturus</i>	Ribbonfish	Savalai, Valai	46TL	SSD
12	<i>Thunnus albacares</i>	Yellowfin tuna	Kera,choorai	50FL	MSM
13	<i>Thunnus tonggol</i>	Longtail tuna	Choorai,Ettala	44FL	MSM
14	<i>Katsuwonus pelamis</i>	Skipjack tuna	Varichoorai,Choorai	35FL	MSM
15	<i>Euthynnus affinis</i>	Little tunny	Ratha choorai,Choorai	31 FL	MSM
16	<i>Sarda orientalis</i>	Bonito	Cheela surai	35FL	MSM
17	<i>Auxis rochei</i>	Bullet tuna	Elichoorai	18 FL	MSM
18	<i>Auxis thazard</i>	Frigate tuna	Elichoorai	25 FL	MSM
19	<i>Gymnosarda unicolor</i>	Dogtooth tuna	Pallanchoorai	50FL	MSM
20	<i>Scomberomorus commerson</i>	Narrow barred Spanish mackerel, Kingfish	Vajram,Nettiyan Seelai	50FL	MSM
21	<i>Scomberomorus guttatus</i>	Indo-Pacific king mackerel, Spotted seer	Vajram,Seelai	37FL	SFM
22	<i>Coryphaena hippurus</i>	Dolphinfish/Mahimahi	Ailas,Parla	38FL	MSM
23	<i>Decapterus macrosoma</i>	Shortfin scad	Kilichal,Parai	14TL	MSM
24	<i>Decapterus russelli</i>	Indian scad	Kilichal,Parai	11TL	MSM
25	<i>Megalaspis cordyla</i>	Horse mackerel	Kilichal,Parai	19TL	SSD
26	<i>Selar crumenophthalmus</i>	Bigeye scad	Ayila parai	16TL	MSM
27	<i>Scomberoides tala</i>	Barred queenfish	Thol parai,Katta parai	30FL	MSM

28	<i>Scomberoides tol</i>	Needlescaled queenfish	Thol parai,Katta parai	23FL	MSM
29	<i>Scomberoides commersonianus</i>	Talang queenfish	Thol parai,Katta parai	32FL	MSM
30	<i>Sphyræna putnamae</i>	Sawtooth barracuda	Ooli,seela	27FL	MSM
31	<i>Sphyræna obtusata</i>	Obtuse barracuda	Ooli,seela	17 FL	MSM
32	<i>Sphyræna barracuda</i>	Great barracuda	Ooli,seela	76FL	MSM
33	<i>Rachycentron canadum</i>	King seer/Cobia	Kadal baral	61FL	SFM
Major demersal fish stocks					
34	<i>Nemipterus bipunctatus*</i>	Delagoa threadfin bream	Changarah	13TL	MSM
35	<i>Nemipterus japonicus</i>	Japanese threadfin bream	Changarah	12TL	MSM
36	<i>Nemipterus randalli</i>	Randall's threadfin bream	Changarah	10TL	MSM
37	<i>Parascalopsis aspinosa*</i>	Smooth dwarf monocle bream	Changarah	10TL	MSM
38	<i>Arius arius*</i>	Threadfin sea catfish	Keluthi	8TL	MSM
39	<i>Nibea maculata</i>	Blotched croaker	Panna	14TL	MSM
40	<i>Otolithes ruber</i>	Tigertooth croaker	Panna kathalai	17TL	MSM
41	<i>Otolithes cuvieri</i>	Lesser tigertooth croaker	Panna kathalai	16TL	MSM
42	<i>Johnius carutta</i>	Karut croaker	Pullu kathalai	15TL	MSM
43	<i>Johnius dussumieri(J.sina)</i>	Sin croaker	Karun kathalai	11 TL	MSM
44	<i>Johnius glaucus</i>	Pale spot fin croaker	Kathalai	15TL	MSM
45	<i>Johnius belangerii</i>	Belanger's croaker	Kathalai	14TL	MSM
46	<i>Kathala axillaris*</i>	Kathala croaker	Kathalai	14TL	MSM
47	<i>Pennahia anea</i>	Donkey croaker	Kathalai	13TL	MSM
48	<i>Lactarius lactarius</i>	Whitefish/False trevally	Sudumbu,Suthumbu,Kuthippu	10TL	MSM
49	<i>Parastromateus niger</i>	Black pomfret	Vaval,Karuvaval	17TL	MSM
50	<i>Pampus argenteus</i>	Silver pomfret	Vaval,Vella vaval	13TL	MSM
51	<i>Saurida undosquamis</i>	Brushtooth lizard fish	Udumbai,Thumbili,Uluvai	10TL	MSM
52	<i>Suarida tumbil</i>	Greater lizardfish	Uluvai,Thumbili	17TL	MSM
53	<i>Saurida micropectoralis*</i>	Shortfin lizardfish	Uluvai,Thumbili	11TL	MSM
54	<i>Synodus myops*</i> (<i>Trachinocephalus myops</i>)	Snakefish	Uluvai,Thumbili	11TL	MSM
55	<i>Upeneus sulphureus*</i>	Sulphur goatfish	Chen Nakarai	11TL	MSM
56	<i>Upeneus taeniopterus*</i>	Fin-stripe goatfish	Nakarai,Navarai	12TL	MSM
57	<i>Upeneus supravittatus*</i>	Longfin goatfish	Nakarai,Navarai	13TL	MSM
58	<i>Parupeneus indicus*</i>	Indian goatfish	Nakarai,Navarai	20TL	MSM
59	<i>Parupeneus heptacanthus*</i>	Cinnabar goatfish	Nakarai,Navarai	13TL	MSM
60	<i>Sillago sihama</i>	Silver sillago	Kelangan	11TL	MSM
61	<i>Photopectoralis bindus*</i>	Orangefin pony	Theevatti karal,Kaaral	7TL	MSM
62	<i>Gazza minuta*</i>	Toothpony	Kaaral	7TL	MSM
63	<i>Eubleekeria splendens*</i>	Splendid ponyfish	Kalikaaral,Kaaral	9TL	MSM
64	<i>Equuilites lineolatus*</i>	Ornate ponyfish	Kaaral	9TL	MSM
65	<i>Leiognathus dussumieri*</i>	Dussumier's ponyfish	Kaaral	8TL	MSM
66	<i>Secutor insidiator*</i>	Pugnose ponyfish	Kaaral	6TL	MSM
67	<i>Priacanthus hamrur</i>	Moontail bullseye	Kakkasi	14TL	MSM
68	<i>Lutjanus lutjanus*</i>	Bigeye snapper	Noolani,Theppili	14TL	MSM
69	<i>Lethrinus lentjan*</i>	Redspot emperor	Velameen	15TL	MSM
70	<i>Epinephelus diacanthus</i>	Spinycheek grouper	Kalava	18TL	MSM
71	<i>Cephalopholis miniata*</i>	Coral hind	Kalava	21TL	MSM
72	<i>Psettodes erumei*</i>	Indian halibut	Erumai Nakku	20TL	MSM
73	<i>Cynoglossus macrostomus</i>	Malabar tonguesole	Nakkumeen	9TL	MSM

74	<i>Carcharhinus limbatus</i> *	Black tip shark	Kundan sorrah	98TL	MSM
75	<i>Carcharhinus falciformis</i> *	Silky shark	Paal Sorrah	180TL	MSM
76	<i>Scoliodon laticaudus</i> *	Spade nose shark	Pillai sorrah	29TL	MSM
77	<i>Rhizoprionodon acutus</i> *	Milkshark	Pal sorrah	58TL	MSM
78	<i>Rhizoprionodon oligolinx</i>	Grey sharpnose shark	Pal Sorrah	53TL	MSM
79	<i>Brevitrygon imbricata</i> (<i>Himantura imbricata</i>)	Bengal whipray	Sembadathan	14DW	MSM
80	<i>Pateobatis jenkinsii</i> (<i>Himantura jenkinsii</i>)	Jenkins whipray	Sembadathan	61DW	MSM
81	<i>Gymnura poecilura</i>	Longtailed butterfly ray	Adavani thirukkai	29DW	MSM
Major cephalopod stocks					
82	<i>Uroteuthis (Photololigo) duvaucelii</i>	Indian squid	White kanava, Oosi kanava	8DML	MSM
83	<i>Uroteuthis (Photololigo) singhalensis</i> *	Long barrel squid	Oosi kanava	9DML	MSM
84	<i>Sepia pharaonis</i>	Pharaoh cuttlefish	Muttai, Kadamba, Varikanava	11DML	MSM
85	<i>Sepia prabahari</i> *	Small striped cuttlefish	Muttai kanava	7DML	MSM
86	<i>Amphioctopus neglectus</i>	Neglected ocellate octopus	Pei kadamba	5DML	MSM
Major crustacean stocks					
87	<i>Charybdis feriatus</i>	Crucifix crab	Siluvai nandu, Kurissu nandu	5CW	MSM
88	<i>Charybdis natator</i> *	Ridged swimming crab	Vari nandu, Parnandu	5CW	MSM
89	<i>Charydis smithii</i> *	Indian swimming crab	Chekappu nandu	4CW	MSM
90	<i>Portunus sanguinolentus</i>	Three-spot swimming crab	Mukkannu nandu, Pottu nandu	7CW	MSM
91	<i>Portunus pelagicus</i>	Flower crab	Pulli nandu	9CW	MSM
92	<i>Portunus gladiator</i> *	Redswimming crab	Cheeni nandu, Chippi nandu	5CW	MSM
93	<i>Penaeus semisulcatus</i> *	Green tiger prawn	Vara eral, Era	11TL	MSM
94	<i>Penaeus indicus</i> *	Indian white prawn	Vella eral, Era	11TL	MSM
95	<i>Penaeus latisulcatus</i> *	Western king prawn	Chori eral, Era	11TL	MSM
96	<i>Metapenaeus dobsoni</i>	Kadal prawn	Chemakara eral, Era	6TL	MSM
97	<i>Metapenaeus monoceros</i>	Speckled prawn	Valucha eral, Era	11TL	MSM
98	<i>Metapenaeus affinis</i>	Jinga prawn	Chaya Valicha eral, Era	9TL	MSM
99	<i>Metapenaeus moyebi</i> *	Moyebi prawn	Vella Valicha eral, Era	6TL	MSM
100	<i>Parapenaeopsis maxillipedo</i> *	Torpedo prawn	Karikadi, Vandu eral	6TL	MSM
101	<i>Parapenaeopsis stylifera</i>	Kiddi prawn	Vandu eral, Era	7TL	MSM
102	<i>Metapenaeopsis stridulans</i> *	Fiddler shrimp	Eral, Era	6TL	MSM
103	<i>Metapenaeopsis hilarula</i> *	Minstrel prawn	Eral, Era	6TL	MSM
104	<i>Metapenaeopsis andamanensis</i> *	Rice velvet prawn	Karikadi	8TL	SFM
105	<i>Solenocera choprai</i>	Ridge back shrimp	Karikadi	6TL	MSM
106	<i>Plesionika quasigrandis</i>	Oriental narwal prawn	Chenakarikadi	8TL	SFM
107	<i>Heterocarpus gibbosus</i> *	Humpback nylon prawn	Karikadi	7TL	SFM
108	<i>Solenocera hextii</i> *	Deep sea mud shrimp	Kall eral, Thakkali eral	7TL	SFM
109	<i>Aristeus alcocki</i>	Arabian red shrimp	Redring	13TL	SFM
110	<i>Panulirus homarus</i> [†]	Scalloped spiny lobster	Singi eral	200g	WFM
111	<i>Panulirus ornatus</i> [†]	Ornate spiny lobster	Singi eral	500g	WFM
112	<i>Panulirus polyphagus</i> [†]	Mud spiny lobster	Singi eral	300g	WFM
113	<i>Thenus unimaculatus</i> [†]	Slipper/Shovel nosed lobster	Kal eral, Madaku eral	150g	WFM

TL-Total Length, FL-Fork length, DW-Disc width, SL- Standard Length, CW - Carapace Width (of crabs), DML-Dorsal Mantle Length (in cephalopods), SFM - Size at First Maturity or the size at which 50% of the fishes (of the particular species) are mature, WFM - Weight at First Maturity, MSM - Minimum Size at Maturity or the size of the smallest mature fish. *Inclusion from Tamil Nadu studies [†]Legal weight fixed by Marine Products Export Development Authority (MPEDA)