SEAFDEC/UNEP/GEF Project on Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand

Lutjanus argentimaculatus

Mangrove red snapper

Scientific classification	
Kingdom:	Animalia
Phylum:	Chordata
Class:	Actinopterygii
Order:	Perciformes
Family:	Lutjanidae
Genus:	*Lutjanus*
Species:	***L. argentimaculatus***

Binomial name

Lutjanus argentimaculatus
(Forsskål, 1775)

Synonyms

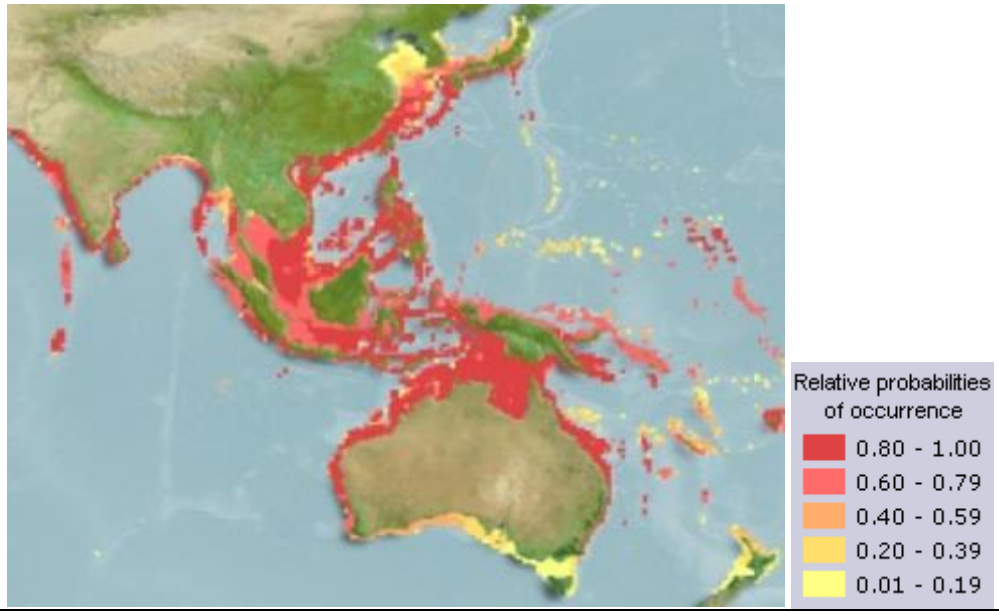
- *Sciaena argentimaculata* Forsskål, 1775
- *Sciaena argentata* J. F. Gmelin, 1789
- *Alphestes gembra* Bloch & J. G. Schneider, 1801
- *Alphestes sambra* Bloch & J. G. Schneider, 1801
- *Perca argentata* Bloch & J. G. Schneider, 1801

- *Mesoprion flavipinnis* G. Cuvier, 1828
- *Mesoprion olivaceus* G. Cuvier, 1828
- *Mesoprion taeniops* Valenciennes, 1830
- *Mesoprion griseoides* Guichenot, 1863
- *Mesoprion garretti* Günther, 1873
- *Lutianus jahngarah* F. Day, 1875
- *Diacopus superbus* Castelnau, 1878
- *Diacope superba* Castelnau, 1878
- *Mesoprion obscurus* W. J. Macleay, 1881
- *Mesoprion roseigaster* W. J. Macleay, 1881
- *Mesoprion sexfasciatus* W. J. Macleay, 1883
- *Lutianus salmonoides* Gilchrist & W. W. Thompson, 1908

A. Environment/Ecology:

Marine; freshwater; brackish; reef-associated; oceanodromous (Ref. 51243); depth range 1 - 120 m (Ref. 9710). Subtropical; 16°C - 30°C (Ref. 2060); 39°N - 35°S, 26°E - 134°W (Ref. 54571)

B. Distribution:



Indo-West Pacific: East Africa to Samoa and the Line Islands, north to the Ryukyu Islands, south to Australia. Has dispersed into the eastern Mediterranean (off Lebanon) via the Suez Canal but not well established there.

C. Length at first maturity / Size / Weight / Age:

Maturity: L_m 57.0 range ? - ? cm Max length : 150 cm TL male/unsexed; (Ref. 3678); common length : 80.0 cm TL male/unsexed; (Ref. 55); max. published weight: 8.7 kg (Ref. 40637); max. reported age: 31 years (Ref. 82366)

D. Short description

Dorsal spines (total): 10; Dorsal soft rays (total): 13-14; Anal spines: 3; Anal soft rays: 8. This species is distinguished by the following characters: body moderately deep, greatest depth 2.3 - 2.7 in SL; preopercular notch poorly developed; vomerine tooth patch crescentic; gill rakers of first gill arch 6-8 + 9-12 = 16-20 (including rudiments); scale rows on back more or less parallel to lateral line, or parallel below spinous part of dorsal fin and sometimes rising obliquely posteriorly, or rarely with entirely oblique rows. Colour of the body generally greenish brown on back, grading to reddish; belly silvery or whitish (deep water specimens usually overall reddish); juveniles with a series of about 8 white and streaks 2 blue across cheeks (Ref. 9821, 90102).

E. Biology

A euryhaline species (Ref. 12743). Juveniles and young adults occur in mangrove estuaries, the lower reaches of freshwater streams (Ref. 30573, 48635, 44894) and tidal creeks (Ref. 44894). Adults are often found in groups around coral reefs (Ref. 9710). Eventually migrate offshore to deeper reef areas, sometimes penetrating to depths in excess of 100 m. Mainly nocturnal, this species feeds mostly on fishes and crustaceans. Excellent food fish (Ref. 5484, 44894). An important market species throughout the Indo-Pacific region, but never found in large quantities. A good aquaculture species because it doesn't get rancid easily when frozen (Ref. 47992). It commands a good export market price with no limit on body size (Ref. 47992). No reported damaging diseases (Ref. 47992). Found in Hong Kong live fish markets (Ref. 27253). Caught mainly with handlines, bottom longlines, and trawls; marketed mostly fresh and dried-salted (Ref. 9821). Maximum length is 104 cm, max weight 14.5 kg and max age 39 years for specimens from the east coast of Australia (pers. comm., Andrew McDougall, 2007).

F. Life cycle and mating behavior

(NA)

G. Fisheries

An important market species throughout the Indo-Pacific region, but never found in large quantities. Caught mainly with nets (redfishes gillnetting, snapper gillnetting), handlines, bottom longlines, and trawls . In 1983 a total catch of 7 815 t was reported to FAO (Fishing Areas 71, 51 and 57). Marketed either fresh or frozen also dried-salted.The total catch reported for this species to FAO for 1999 was 16 129 t. The countries with the largest catches were Malaysia (12 319 t) and Pakistan (3 195 t).

H. IUCN Red List Status

GEOGRAPHIC RANGE

- **Taxonomy**

Kingdom:	Animalia
Phylum:	Chordata
Class:	Actinopterygii

Order:	Perciformes
Family:	Lutjanidae
Genus:	*Lutjanus*

- ## Geographic Range

NUMBER OF LOCATIONS
UPPER DEPTH LIMIT : 1 metres
LOWER DEPTH LIMIT : 120 metres

RANGE DESCRIPTION
Lutjanus argentimaculatus is distributed from eastern Africa (including Madagascar, Mauritius, Reunion and the central islands of the Federated States of Micronesia), north to the Red Sea and Persian Gulf, east to Samoa and Kiribati (the Line Islands), northwards to Japan (Ryukyu Islands), and southwards to Australia. It has dispersed into the eastern Mediterranean via the Suez Canal but is not well established there (Anderson and Allen 2001). This species is found between the depths of 1 to 120 m (Lieske and Myers 1994).

- ## Population

CURRENT POPULATION TREND : UNKNOW

- ## Habitat and Ecology

System : Marine
Habitat type : Marine Neritic, Marine Intertidal

- ## Biological resource use :

Fishing & harvesting aquatic resource

- ## Threats

This species is an important market species and is considered overexploited in some areas (e.g., United Arab Emirates). The estimated fishing mortality of 0.10 year-1 is greater than both the target (FSB40 = 0.05) and limit (FSB30 = 0.07) biological reference points. The estimated exploitation rate of Lutjanus aregentimaculatus is 0.46. Juvenile retention rate in the demersal trawl fishery was 96.7% for Lutjanus aregentimaculatus (Grandcourt et al. 2013). Grandcourt et al. (2013) concluded that Lutjanus aregentimaculatus could be exploited sustainably if they are able to reach sexual maturity before becoming vulnerable to capture. In order for this to occur, the specification of the juvenile escape panel in the demersal trap fishery needs to be revised. Further information is required on harvest levels and therefore the threat of fisheries on the species. In addition, in some areas (e.g., the Persian Gulf), the habitat for juveniles for this species has been seriously degraded. The juveniles depend on mangroves, which have been destroyed for coastal development projects, and depend on some amount of fresh water (inhabit brakish water), which is decreasing. However, we are lacking quantitative data that indicates the Gulf serves as a nursery area for juveniles (Grandcourt et al. 2013). This species is utilized for commercial aquaculture in Pakistan, China, Singapore, Malaysia, Thailand and the Philippines (Emata 1996, Emata et al. 1999, Hong and Zhang 2002).

Conservation status

Least Concern (IUCN 3.1)

- **Use and Trade**

  Lutjanus argentimaculatus is an important market species throughout its range but is not often found in large quantities. It is caught mainly with nets, handlines, bottom longlines, and trawls (Anderson and Allen 2001). Landings in Malaysia and Pakistan range from 1,000 to 10,000 metric tonnes (FishStatJ 2014). This species has been to spawned and reared in captivity (Lau and Li 2000) and a good aquaculture species because it doesn't get rancid easily when frozen (Lessa et al 1999). Grandcourt et al. (2013) concluded that Lutjanus aregentimaculatus could be exploited sustainably if they are able to reach sexual maturity before becoming vulnerable to capture. In order for this to occur, the specification of the juvenile escape panel in the demersal trap fishery needs to be revised. This species is utilized for commercial aquaculture in Pakistan, Singapore, Malaysia, Thailand and the Philippines (Emata et al. 1999).

- **Conservation Action**

  This species was listed as Least Concern in the Gulf (IUCN 2015). There are a number of marine protected areas that intersect with the range of L. argentimaculatus (IUCN UNEP 2014). Policies in the regulation and management of the harvest of this species are suggested, as well as further research regarding the habitats and ecology and the population dynamics and trends of the species.

I. More Information:

1) Stocks

(NA)

2) Ecology

Ecology of *Lutjanus argentimaculatus*

Main Ref.	Allen, G.R., 1985
Distribution	Brackishwater • **estuaries/lagoons/brackish seas**

	• **mangroves**
Remarks	Euryhaline species (Ref. 12743). Juveniles and young adults occur in mangrove estuaries, the lower reaches of freshwater streams (Ref. 30573, 48635, 44894) and tidal creeks (Ref. 44894). Adults are often found in groups around coral reefs (Ref. 9710). Eventually migrate offshore to deeper reef areas, sometimes penetrating to depths in excess of 100 m. Mainly nocturnal, feed mostly on fishes and crustaceans (Ref. 55). Habitat frequently consists of areas of abundant shelter in the form of caves or overhanging ledges. Carnivore (Ref. 57615).

Substrate

Substrate	**Hard Bottom**: rocky;
Substrate Ref.	Letourneur, Y., P. Chabanet, P. Durville, M. Taquet, E. Teissier, M. Parmentier, J.-C. Quéro and K. Pothin, 2004
Special habitats	**Coral Reefs**;
Special habitats Ref.	Nguyen, N.T. and V.Q. Nguyen, 2006

Feeding

Feeding type	mainly animals (troph. 2.8 and up)
Feeding type ref	Allen, G.R., 1985
Feeding habit	hunting macrofauna (predator)
Feeding habit ref	Allen, G.R., 1985

Trophic level(s)

	Original sample		Unfished population		Remark
Estimation method	Troph	s.e.	Troph	s.e.	
From diet composition	3.58	0.49	3.64	0.67	Troph of juv./adults from 1 study.
Ref.	Kulbicki, M., Y.-M. Bozec, P. Labrosse, Y. Letourneur, G. Mou-Tham and L. Wantiez, 2005				
From individual food items	3.85	0.64			Trophic level estimated from a number of food items using a

						randomized resampling routine.

3) Diet

Food and Feeding Habits: Diet Composition *Lutjanus argentimaculatus*

n = 1

Main Food	Percent	Trophic Level (y)	Predator Life Stage	Country	Locality	Ref.
zoobenthos	81	3.6	juv./adults	New Caledonia	1985-1997	55797

4) Reproduction

Reproduction of *Lutjanus argentimaculatus*

Main Ref.	Allen, G.R., 1985
Mode	dioecism
Fertilization	external
Spawning aggregation	Yes. **Ref.** SCRFA, Science and Conservation of Fish Aggregations, 2018
Batch spawner	Yes. **Ref.** Allen, G.R., 1985
Reproductive guild	nonguarders open water/substratum egg scatterers
Parental Care	none
Search for more references on reproduction	Scirus

5) Maturity

Maturity studies for *Lutjanus argentimaculatus*

n = 4

Sort by (•) Lm ( ) Country ( ) Locality ( ) tm

Lm (cm)	Length (cm)			Age range (y)			tm (y)	Sex of fish	Country	Locality
	55.0	-			-			unsexed		Aisa-Pacific Region

49.0 SL		-			-			unsexed	South Africa	southern African estuaries
49.6 TL		-			-		4.00	male	Philippines	concrete tanks
57.0 TL		-			-		5.00	female	Philippines	concrete tanks

6) Spawning

Spawning for *Lutjanus argentimaculatus*

n = 2

J	F	M	A	M	J	J	A	S	O	N	D	Country	Locality
111	111	111	111	111	111	111	111	111	111	111	111		At least in lower latitudes
		111	111	111	111	111	111	111	111	111		Philippines	floating-cages, SEAFDEC Marine substation

7) Spawning aggregation

Spawning Aggregations of *Lutjanus argentimaculatus*

[n = 1]

Country	Spawning type	Aggregation type	Status
Papua New Guinea	Unknown	Transient	Decreasing

8) Fecundity

(NA)

9) Eggs

(NA)

10) Egg development

(NA)

11) Age/Size

List of Population Characteristics records for *Lutjanus argentimaculatus*

n = 8

Sex	Wmax	Lmax (cm)	Tmax (y)	Country	Locality
unsexed	8.7 kg			Global	unspecified

unsexed		42.6		Philippines	Palawan / 1998-2014
unsexed		57	31	Papua New Guinea	Lihir Island group (seamount), 1999-2002
unsexed		120		Global	East Indies
unsexed		120		India	Not specified
unsexed		120		Iran	Persian Gulf and Oman Sea
unsexed		150			Aisa-Pacific Region
unsexed		150		South Africa	South Africa

12) Growth

Growth parameters for *Lutjanus argentimaculatus*

Maximum Length 150cm TL

n = 2

Note that studies where Loo is very different (+/- 1/3) from Lmax are doubtful.

M vs K graph	[n = 1]
M vs Linf graph	[n = 1]
Longevity vs 3/K graph	[n = 1]

ø = 3.31 **L inf** = 105.0 cm TL **K** = 0.2 Median record no. 22299Ref. 2299

Loo (cm)	Length Type	K (1/y)	M (1/y)	Temp° C	Ø'	Country	Locality	Questionable	Captive
55.6	SL	0.190			2.77	Papua New Guinea	Lihir Island group (seamount)	Yes	No
105.0	TL	0.187	0.25	27.0	3.31	Malaysia	East coast of peninsula	No	No

13) Length-weight

Length-Weight Parameters for *Lutjanus argentimaculatus*

Length-weight (log *a* vs *b*) graph [n=8]
Hide graph

Sort by a b Country Locality

Score	a	b	Sex	Length (cm)	Length type	r^2	SD b	SD $\log_{10}$ a	n	Country	Locality

0.99	0.03360	2.792	unsexed	5.5 - 67.5	FL	0.986		365	New Caledonia	lagoon
1.00	0.02900	2.810	unsexed	16.5 - 42.6	TL	0.996		13	Pac Is Trust Tr	Palawan / 1998-2014
1.00	0.05480	2.818	unsexed	16.5 - 57.0	SL	0.996	0.113 0.1647	14	Philippines	Davao Gulf / 2009-2012
0.99	0.04590	2.823	unsexed	7.9 - 54.0	SL	0.994		8	South Africa	estuaries, 1993-99
0.99	0.02800	2.844	mixed	5.5 - 68.0	FL	0.994		308	New Caledonia	
0.98	0.01880	2.960	unsexed	31.4 - 68.7	FL	0.980	0.090 0.1471	85	Guam	2009-2013
0.50	0.00710	3.180	unsexed		TL				South Africa	
0.70	0.00540	3.206	unsexed	48.0 - 82.0	TL			37	Vanuatu	

14) Length-length

Length-length Parameters for *Lutjanus argentimaculatus*

[n=4]

Unknown length	a	b	Known length	Length range (cm)	Sex of fish
SL	0.000	0.841	FL	-	unsexed
SL	0.000	0.810	TL	79 - 79	unsexed
TL	0.000	1.018	FL	-	unsexed
TL	0.000	1.176	SL	-	unsexed

15) Length-frequencies

List of frequency studies for *Lutjanus argentimaculatus*

Locality	Year from - to	Sex	Gear	Frequency type
Tigak Island (Kavieng fish depot), Papua New Guinea	1981 - 1981	unsexed/mixed	other	absolute number measured

16) Morphometrics

Morphometric Data for *Lutjanus argentimaculatus*

n = 2

Picture Name	Length		Lifestage	Aspect ratio
Luarg_u1.jpg	44.7	SL	unsexed	1.69
Luarg_u6.jpg	7.5	SL	unsexed	1.44

Picture Used	Luarg_u1.jpg
Size (cm)	44.7 SL, 55.4
Sex	unsexed
Total length (TL)	575 pixels
Standard length	85.0 % TL
Fork length	98.3 % TL
Pre-anal length	59.5 % TL
Pre-dorsal length	32.7 % TL
Pre-pelvic length	31.7 % TL
Pre-pectoral length	28.0 % TL
Body depth	29.6 % TL
Head length (HL)	28.5 % TL
Eye diameter	16.5 % HL
Pre-orbital length	34.8 % HL
Aspect ratio of caudal fin	1.68896

Picture Used	Luarg_u6.jpg
Size (cm)	7.5 SL, 9.2
Sex	unsexed
Total length (TL)	578 pixels
Standard length	84.9 % TL
Fork length	98.8 % TL
Pre-anal length	56.1 % TL
Pre-dorsal length	31.0 % TL
Pre-pelvic length	31.1 % TL
Pre-pectoral length	29.4 % TL
Body depth	34.3 % TL
Head length (HL)	31.1 % TL
Eye diameter	24.4 % HL
Pre-orbital length	28.3 % HL
Aspect ratio of caudal fin	1.44383

17) Morphology

Morphology Data of *Lutjanus argentimaculatus*

Identification keys
Abnormalities

Main Ref.	Anderson, W.D. Jr. and G.R. Allen, 2001

Sex attributes

Specialized organs	no special organs
Different appearance	males alike females
Different colors	males alike females

Descriptive characteristics of juvenile and adult

Striking features	none
Body shape lateral	fusiform / normal
Cross section	oval
Dorsal head profile	more or less straight
Type of eyes	more or less normal
Type of mouth/snout	more or less normal
Position of mouth	terminal
Type of scales	ctenoid scales
Diagnosis	This species is distinguished by the following characters: body moderately deep, greatest depth 2.3 - 2.7 in SL; preopercular notch poorly developed; vomerine tooth patch crescentic; gill rakers of first gill arch 6-8 + 9-12 = 16-20 (including rudiments); scale rows on back more or less parallel to lateral line, or parallel below spinous part of dorsal fin and sometimes rising obliquely posteriorly, or rarely with entirely oblique rows. Colour of the body generally greenish brown on back, grading to reddish; belly silvery or whitish (deep water specimens usually overall reddish); juveniles with a series of about 8 white and streaks 2 blue across cheeks (Ref. 9821, 90102).

Meristic characteristics of Lutjanus argentimaculatus

Lateral Lines	1 Interrupted: No
Scales on lateral line	44 - 48
Pored lateral line scales	44 - 48
Scales in lateral series	
Scale rows above lateral line	4 - 6
Barbels	0
on lower limb	9 - 12
on upper limb	6 - 8
total	16 - 20

Fins

Dorsal fin(s)

Attributes	extending over most of the back length
Fins number	1notched No
Finlets No.	Dorsal 0 - 0
	Ventral 0 - 0
Spines total	10 - 10
Soft-rays total	13 - 14
Adipose fin	absent

Caudal fin

Attributes	more or less truncate; more or less normal

Anal fin(s)

Fins number	1
Spines total	3 - 3
Soft-rays total	8 - 8

Paired fins

Pectoral	Attributes more or less normal
	Spines 0
	Soft-rays 16 - 17
Pelvics	Attributes more or less normal
	Position thoracic before origin of D1
	Spines 1
	Soft-rays 5 - 5

18) Larvae

Larvae Information Summary for *Lutjanus argentimaculatus*

Main Ref:	Okiyama, M. 1993

Yolk-sac larvae

Place of development	planktonic
Larval area	Northwestern Pacific (Japan)

Post larvae

Striking feature	none
Striking feature	none
Pectorals	normal
Pelvics	normal (i.e. small or absent)

19) Recruitment

(NA)

20) Abundance

(NA)

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