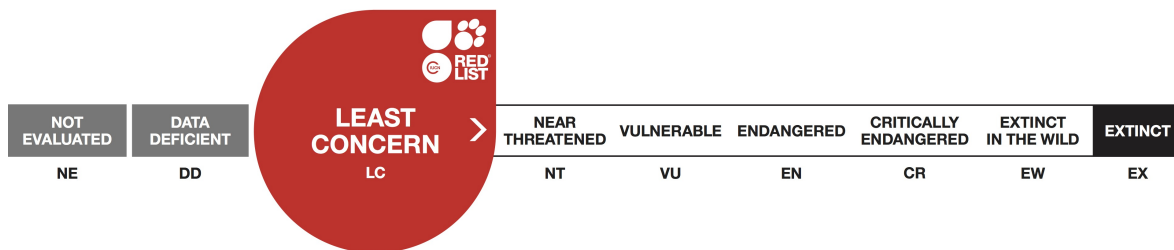


Epinephelus chlorostigma, Brownspotted Grouper

Assessment by: Fennessy, S., Choat, J.H., Nair, R. & Robinson, J.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Actinopterygii	Perciformes	Epinephelidae

Taxon Name: *Epinephelus chlorostigma* (Valenciennes, 1828)

Synonym(s):

- *Serranus areolatus* ssp. *japonicus* Temminck & Schlegel, 1843
- *Serranus assabensis* Giglioli, 1889
- *Serranus chlorostigma* Valenciennes, 1828
- *Serranus reevesii* Richardson, 1846

Common Name(s):

- English: Brownspeckled Grouper, Brown-speckled Grouper, Brown-speckled Reef-cod, Brownspeckled Rockcod
- French: Gris fin, Loche pintade, Merou pintade, Pintade
- Spanish: Mero Pintado

Taxonomic Source(s):

Eschmeyer, W.N., Fricke, R., and Ven der Laan, R. (eds.). 2017. Catalog of Fishes: genera, species, references. Updated 31 July 2017. Available at: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>.

Taxonomic Notes:

Epinephelus chlorostigma is very similar to and easily confused with *E. gabiellae* and *E. polylepis*. These two species replace *E. chlorostigma* in the northwest Indian Ocean, including the Persian Gulf.

Assessment Information

Red List Category & Criteria: Least Concern [ver 3.1](#)

Year Published: 2018

Date Assessed: November 18, 2016

Justification:

Epinephelus chlorostigma is a fairly widespread and relatively abundant species that inhabits reefs in both shallow and deep waters. There are signs of localised declines due to fishing effort in some areas, particularly in the Seychelles, and suspected declines in others (Indonesia). Catches of this species are generally low in comparison to other groupers in many parts of its range, which may be a function of its deeper depth preference. Population declines are not suspected on a global level at this time; therefore, it is listed as Least Concern. It is recommended that catches, particularly in areas where groupers are lumped, should be monitored carefully and frequently to provide more species-specific quantitative information.

Geographic Range

Range Description:

This Indo-Pacific species is distributed from Yemen to KwaZulu-Natal (South Africa), east to the western Pacific (including Madagascar), north to southern Japan and south to New Caledonia (Heemstra and Randall 1993). Records from the Persian Gulf are apparently misidentifications of *Epinephelus polylepis*; and records from the Red Sea are likely to be the newly-described *E. geoffroyi* (Randall *et al.* 2013). Although Randall *et al.* (2013) stated there are no confirmed records for continental waters of Asia or Australia, and none for the East Indies, except one from Papua New Guinea, it has since been reported from India, the eastern Andaman Sea, Timor, and off Northern Territory, Australia. Rome and Newman (2010) report it from Western Australia on offshore islands and shoals, and it features in landings on the east and west coasts of India. Its depth range is four to 280 metres.

It is known from the following specific localities: Djibouti (M. Samoilys and H. Choat pers. comm. 2016), Aden (Yemen), Somalia (Darar 1994, Mann and Fielding 2000; possible misidentification), Kenya, Tanzania, Mozambique, South Africa (KwaZulu-Natal), southwestern Madagascar (R. Myers distributional database 2016), east coast of Madagascar (A. Pages, Refrigepech Est. pers. comm.), Comoros, Seychelles, Réunion, Mauritius, Maldives, India, Indian islands (Andaman, Nicobars, Lakshadweep), Sri Lanka, Myanmar, Thailand (East Burma Sea), Cambodia, southern Vietnam, Korea, Indonesia/Malaysia (northern Sumatra, Malaysian peninsula, Sunda shelf, Bali), Western Australia, Papua New Guinea, New Caledonia and Vanuatu, Samoa, southern Japan, Fiji, Taiwan (R. Myers distributional database 2016), China (including Hong Kong).

Country Occurrence:

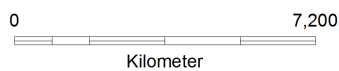
Native: American Samoa; Australia; British Indian Ocean Territory (Chagos Archipelago); Cambodia; China; Comoros; Djibouti; Fiji; Hong Kong; India; Indonesia; Japan; Kenya; Korea, Republic of; Macao; Madagascar; Maldives; Marshall Islands; Mauritius; Mayotte; Micronesia, Federated States of; Mozambique; Myanmar; New Caledonia; Oman; Palau; Papua New Guinea; Réunion; Samoa; Seychelles; Solomon Islands; Somalia; South Africa; Sri Lanka; Taiwan, Province of China; Tanzania, United Republic of; Thailand; Timor-Leste; Tonga; Tuvalu; Vanuatu; Viet Nam; Wallis and Futuna; Yemen

FAO Marine Fishing Areas:

Native: Indian Ocean - western, Indian Ocean - eastern, Pacific - western central, Pacific - northwest, Pacific - eastern central

Distribution Map

Epinephelus chlorostigma



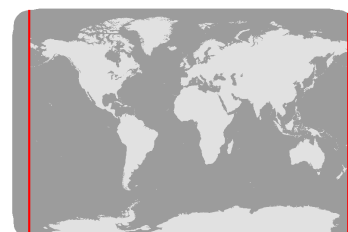
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Range

Extant (resident)

Compiled by:

IUCN Grouper and Wrasse Specialist Group



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.



Population

Epinephelus chlorostigma is an abundant species throughout most of its range, and is naturally uncommon in some regions. It is infrequently recorded in underwater surveys throughout its range (e.g., Chater *et al.* 1995, Robertson *et al.* 1996, Pereira 2003, Reef Life Survey, PROCFish); however, the species could be more abundant in the deeper portion of its depth range which is beyond the depths of typical survey effort. It was rarely recorded (three individuals out of 1,278 grouper individuals sampled) in a survey of boat catches from non-coral reefs off the central KwaZulu-Natal coast from 1985 to 1987 (Oceanographic Research Institute unpubl. data). In the same area, only two out of 365 grouper individuals sampled from commercial and recreational offshore boats from 1994 to 1996 were identified as this species (Mann *et al.* 1997), and none were observed during 2008 to 2009 (Dunlop 2011). It was moderately common (n=31 individuals, 4.5% of groupers) on the North Kenya Banks in the late 1950s (Morgans 1964), and uncommonly observed (n=4 of 130 groupers) during sampling of hook and line catches in the mid-1970s (Nzioka 1977). It was occasionally recorded in semi-industrial trap catches in central Mozambique from 1997 to 1998 (n=23 out of 1,304 grouper individuals)(Abdula *et al.* 2000). Only one individual out of >9,000 grouper individuals was observed in a survey of the semi-industrial line fishery in southern Mozambique from 2002 to 2014 (R. Mutombene unpublished data). It was uncommonly landed by contemporary artisanal fisheries targeting groupers off southern Kenya in February to July 2007 (one out of 950 grouper individuals) (Agembe *et al.* 2010). This species was commonly captured in the early 2000s in a commercial linefishing fleet out of Tamatave, Madagascar, and comprised about 20% of all grouper caught (total grouper catch was about 30 mt yr⁻¹) (A. Pages pers. comm.). It has been reported in catches from Reunion, but catch is lumped with several other grouper species (L. Miossec pers. comm.). Catches from Oman are likely misidentifications of *E. gabriellae* (J. McIlwain pers. comm). In India, landings fluctuated and were generally negligible between 2007 to 2014, except for 115 tons landed in 2008 (R. Nair pers. comm.; see Figure 1 in the Supplementary Information). Only nine out of 2,058 grouper individuals (0.4%) were identified as this species at landing sites on the east coast of India in 2009 to 2011 (Kandula *et al.* 2015), and 1% of grouper trawl landings on the west coast of India were this species (Manojkumar 2005). This species is reportedly abundant on seamounts off the west coast of India (Bineesh *et al.* 2014). It is reported from the Maldives, but no catch data are available (Sattar and Adams 2005, Sattar *et al.* 2011). Percentage contributions of this species to grouper catches from “essentially unexploited” deep-slope reefs were moderate to low in Melanesia (7.1%), Micronesia (2.4%) and Polynesia (0.2%) (Dalzell and Preston 1992 as reported in Dalzell *et al.* 1996). It contributed 1% to the total catch (~7% of all groupers) in the Indonesian (south-east) deep-water snapper fishery in 2014-2016, and spawning potential ratio was < 25%, suggesting that the stock was overexploited (Mous and Pet 2016a,b). Out of 5,425 groupers sampled in the Honiara fish market in the Solomons in 2015-2016, only 14 individuals of this species were observed (0.3%) (K. Rhodes pers. comm). This species contributed only 0.1% to the overall number of serranids in markets in Pohnpei (Micronesia) in January-May 2006 (Rhodes and Tupper 2007). In most years, this is the principal species of grouper landed by artisanal hook-and-line fisheries in the Seychelles. Catch per unit effort (CPUE) for grouper in the inshore handline fishery in the Seychelles, of which *E. chlorostigma* is one of the main species, significantly declined after 1990, from over 0.6 to less than 0.3 kg/fisher/hr (Grandcourt and Cesar 2002). CPUE in the offshore schooner line fishery also declined significantly, from around 3.5 kg/man^{-day} in 1986 to just over 1.0 kg/man^{-day} since 2002. By contrast, CPUE in the whaler handline fishery has remained relatively stable since 1990 (between 0.5 and 1.2 kg/man^{-day}), but effort estimation was confounded by a degree of target switching (demersal to pelagic) which may have varied from year to year and was not reliably accounted for in the surveys

(Grandcourt and Cesar 2002). Assessments conducted in the early 1990s indicated that the fishery was exploited around maximum sustainable yield (MSY) levels (Mees 1992), localised depletion was observed and populations were considered vulnerable to pulse and sequential fishing as the whaler and schooner fisheries expanded and a mothership-dory fishery operated (Mees 1996). Landings declined significantly (130 to 60 tons) after the cessation of the mothership-dory fishery in 1994. Since then, landings have been variable but trending towards a decline (37 tons in 2015; see Figure 2 in the Supplementary Information). Though the results of a recent stock assessment are not unequivocal for this species, standardised CPUE based on a subset of the fleet data was fairly constant from 1985 to 1996, declined sharply in 1998 and peaked in 2002. Since then it has shown a general decline to 50% of the 2002 level by 2013 (Gutierrez 2015; see Figure 3 in the Supplementary Information). Albeit a standardized CPUE, Gutierrez (2015) cautioned that changes in fleet dynamics could have affected the trend. Moussac (1996) attributed a skewed sex ratio (F:M) of 2.4:1 to fishing, and noted that a more balanced ratio of 1.1:1 occurs where populations are not so heavily fished. Further, more than 50% of the catch was immature raising the possibility of recruitment overfishing. Recent annual estimates of length at first capture (L_{c50} : 31–36 cm) are slightly greater than $0.5L_{\infty}$.

For further information about this species, see [Supplementary Material](#).

Current Population Trend: Stable

Habitat and Ecology (see Appendix for additional information)

This species inhabits a wide depth range (four to 280 m) on coral and rocky reefs, outer reef slopes and seagrass beds (Heemstra and Randall 1993). In the Seychelles, it is common across the Mahe Plateau and surrounding banks, especially at depths from 40 to 60 m. It is more abundant over rough rubble and coralline areas, but has been taken in (experimental) trawls over more sandy areas (J. Robinson pers. comm.). In the Seychelles, it frequents the shelf edges of the banks and has been fished down to depths of 250 m (Intes and Bach 1989). It is less common on the atolls to the south of Seychelles and appears absent on shallow reefs (Pears 2005). In the South China Sea, it has also been recorded from mud bottoms. Its maximum total length is 75 to 81 cm (Heemstra and Randall 1993, MRAG 1996, Oceanographic Research Institute unpublished data). This species is protogynous, with sex change first occurring at around 34 cm total length, and the first active males appearing at 37 cm (Moussac 1996). Females mature between 23 and 29 cm total length (Heemstra and Randall 1993). In the Seychelles, Moussac (1996) reported maturity at about 31 cm. Morgans (1982) reported maturity at 25 cm standard length in Kenya (Sanders *et al.* 1988). The spawning season of *Epinephelus chlorostigma* in the Seychelles was protracted, occurring between November and April and with peaks at the beginning and end of that period (Sanders *et al.* 1988). These peak periods correspond to the inter-tropical monsoon months. While a few fishers have reported the formation of spawning aggregations (Robinson *et al.* 2004), mating and spatial patterns of spawning are unverified. It is considered unlikely that transient aggregations occur (or used to occur) in this species, as large aggregations of common target species are generally well known to fishers (J. Robinson pers. comm.).

Estimates of natural mortality using the growth parameters of Mees (1992) and Sanders *et al.* (1988) vary from 0.43 yr^{-1} , using Pauly's (1980) method, to between 0.37 and 0.39 yr^{-1} using Ralston's (1987) model, which is considered more reliable for slow-growing fish. One generation length (GL) is estimated at about 18 years (based on: $GL = \text{age of first reproduction (4 years)} + [z * \text{length of the reproductive period (29 years)}]$; z value of 0.5).

Systems: Marine

Use and Trade

This species is utilized in fisheries throughout its range.

Threats (see Appendix for additional information)

Unsustainable fishing pressure in some areas may be causing localised declines, but this is not considered a major threat on a global-level. Fishing effort may be increasing in some areas (Cunningham and Bodiguel 2006, Flewelling and Hosch 2006), but effort generally occurs in only the shallower portion of this species' wide depth range.

Conservation Actions (see Appendix for additional information)

This species occurs in some protected areas within its range. In KwaZulu-Natal, South Africa, most of the north coast and the adjacent coast of southern Mozambique is protected by a ~ 220 km long marine protected area in which no demersal fishing is allowed. There are also marine protected areas in northern Mozambique, Seychelles, Tanzania and Kenya which offer protection. In South Africa, a maximum of five individuals of this species may be retained by recreational fishers per day; there are no limits for commercial fishers. In Mozambique, a maximum of 10 individuals of demersal species may be retained by recreational fishers.

Credits

Assessor(s): Fennessy, S., Choat, J.H., Nair, R. & Robinson, J.

Reviewer(s): Linardich, C.

Contributor(s): Pollard, D.A.

**Facilitators(s) and
Compiler(s):** Craig, M.T.

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External Resources

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Appendix

Habitats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Habitat	Season	Suitability	Major Importance?
9. Marine Neritic -> 9.2. Marine Neritic - Subtidal Rock and Rocky Reefs	Resident	Suitable	Yes
9. Marine Neritic -> 9.3. Marine Neritic - Subtidal Loose Rock/pebble/gravel	Resident	Suitable	Yes
9. Marine Neritic -> 9.4. Marine Neritic - Subtidal Sandy	Resident	Suitable	Yes
9. Marine Neritic -> 9.5. Marine Neritic - Subtidal Sandy-Mud	Resident	Suitable	Yes
9. Marine Neritic -> 9.9. Marine Neritic - Seagrass (Submerged)	Resident	Suitable	Yes

Threats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Threat	Timing	Scope	Severity	Impact Score
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.1. Intentional use: (subsistence/small scale) [harvest]	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.2. Intentional use: (large scale) [harvest]	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality		

Conservation Actions in Place

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Conservation Actions in Place
In-Place Land/Water Protection and Management
Occur in at least one PA: Yes

Research Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
3. Monitoring -> 3.1. Population trends

Additional Data Fields

Distribution
Lower depth limit (m): 280
Upper depth limit (m): 4
Population
Population severely fragmented: No
Habitats and Ecology
Generation Length (years): 18

The IUCN Red List Partnership



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