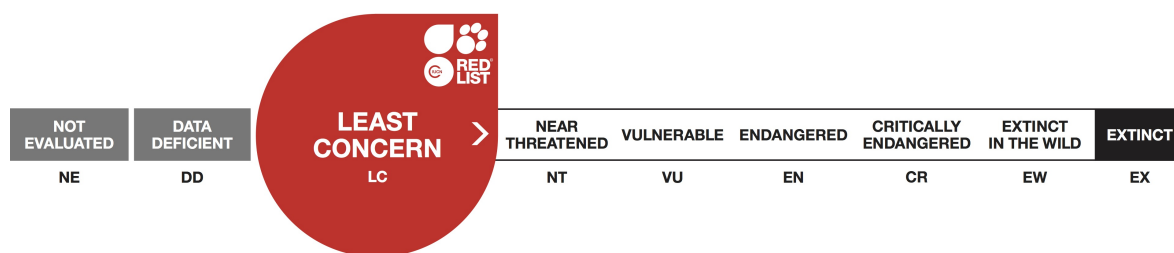


## *Lamna ditropis*, Salmon Shark

Assessment by: Rigby, C.L., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Herman, K., Jabado, R.W., Liu, K.M., Marshall, A. & Romanov, E.



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## Taxonomy

| Kingdom  | Phylum   | Class          | Order       | Family   |
|----------|----------|----------------|-------------|----------|
| Animalia | Chordata | Chondrichthyes | Lamniformes | Lamnidae |

**Taxon Name:** *Lamna ditropis* Hubbs & Follett, 1947

### Common Name(s):

- English: Salmon Shark

## Assessment Information

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

**Year Published:** 2019

**Date Assessed:** November 6, 2018

### Justification:

The Salmon Shark (*Lamna ditropis*) is a large (to 305 cm total length) pelagic shark that occurs only in the North and Central Pacific, where it is wide-ranging in sub-Arctic and temperate nearshore and oceanic waters to depths of 1,864 m. This species has low biological productivity with small litters and a biennial reproductive cycle. It is caught as target and bycatch in coastal and pelagic commercial and small-scale longline, purse seine, and gillnet fisheries, and is often retained for its meat as well as fins. The population appeared to be stable at relatively high levels of abundance during the 1990s and early 2000s. Since cessation of an open ocean gillnet fishery in the early 1990s, the population may be rebuilding. There is no information available on population trends since that time, except an anecdotal note by recreational fishers of a decline in catch in Prince William Sound, Alaska that resulted in a self-imposed avoidance of this species. Other than this noted decline in Alaska, there is nothing to infer population decline and thus, the species is assessed as Least Concern. Improved catch monitoring, analysis of the population trend analysis, and precautionary fishing limits are recommended.

### Previously Published Red List Assessments

2009 – Least Concern (LC)

<http://dx.doi.org/10.2305/IUCN.UK.2009-2.RLTS.T39342A10210228.en>

2000 – Data Deficient (DD)

## Geographic Range

### Range Description:

The Salmon Shark is wide-ranging throughout the North and Central Pacific, ranging north to ~65°N and south to ~30°N (Goldman and Musick 2008, Ebert *et al.* 2013).

### Country Occurrence:

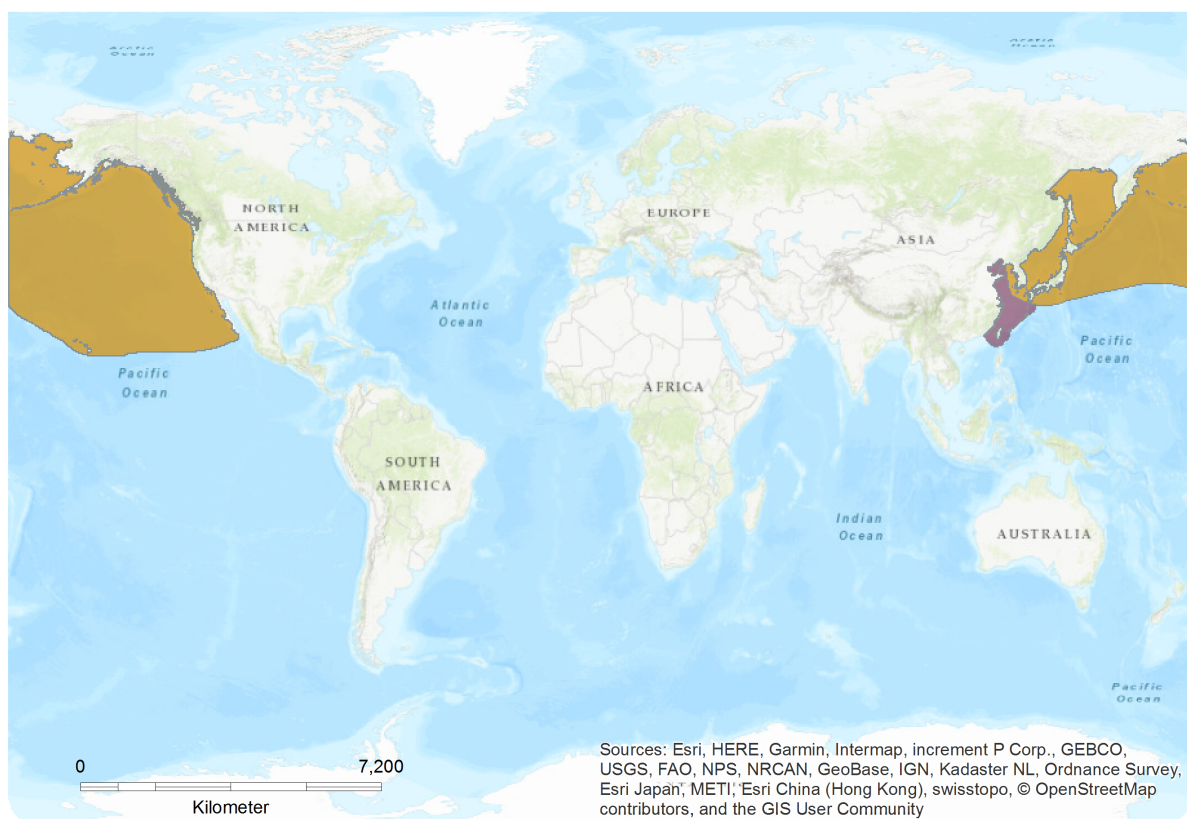
**Native:** Canada; China; Japan; Korea, Democratic People's Republic of; Korea, Republic of; Mexico; Russian Federation; United States (Hawaiian Is.)

**FAO Marine Fishing Areas:**

**Native:** Pacific - northwest, Pacific - northeast, Pacific - eastern central

# Distribution Map

*Lamna ditropis*

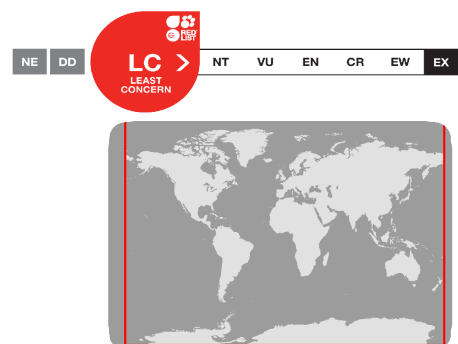


## Range

- Extant (resident)
- Possibly Extant (resident)

## Compiled by:

IUCN SSC Shark Specialist Group



## Population

There are no data available on the genetic stock structure of the Salmon Shark. Although a highly migratory shark, the degree of mixing between the Northeast and Northwest Pacific is unknown (Hulbert *et al.* 2005, Weng 2008, Conrath *et al.* 2014).

The population size of the Salmon Shark was estimated to be 16,600,000–21,900,000 individuals in 1989 (Shimida and Nakano unpubl. data, cited in Nagasawa 1998), however, no information was provided on how these estimates were derived. The Salmon Shark was historically taken in the 1950s and 1960s in relatively large numbers, but since those fisheries ceased in the 1990s, it appears fishing mortality of Salmon Shark in the open ocean has reduced and the population could be rebuilding (Goldman and Musick 2008). Based on landings data in Japan, the population of Salmon Sharks was considered stable in the Northwest Pacific from 1985 to 1995 (Nagasawa 1998). Demographic analysis indicated that in the early 2000s, the population of Salmon Shark was stable across the Northeast and Northwest Pacific, but that Salmon Sharks are vulnerable to fishing mortality (Goldman 2002). Anecdotal information by recreational fishers notes a decline in recreational catch during 2009–2010 in Prince William Sound, Alaska, but no further information is available (Orion Charters 2017). No additional information or data are available on population trends across the range of the species.

**Current Population Trend:** Stable

## Habitat and Ecology (see Appendix for additional information)

The Salmon Shark occurs in sub-Arctic and temperate nearshore and oceanic waters to depths of 1,864 m, though generally they range down to 300 m (Goldman and Musick 2008, Carlisle *et al.* 2011, Ebert *et al.* 2013). It reaches a maximum size of 305 cm total length (TL) (Goldman and Musick 2006), males mature at 180–240 cm TL, and females mature at 195–250 cm TL (Goldman 2002, Goldman and Musick 2006, Ebert *et al.* 2013). Reproduction is aplacental viviparous and oophagous with litter sizes of 2–5, a gestation period of 8–9 months, a biennial reproductive cycle, and size at birth of 65–80 cm TL (Tanaka 1980, Nagasawa 1998, Goldman and Musick 2006, Goldman and Musick 2008, Ebert *et al.* 2013, Conrath *et al.* 2014). There is regional variation in age estimates between the Northeast and Northwest Pacific; female age-at-maturity is 6–9 and 8–10 years, observed maximum age for females is 20 and 17 years; and, generation length is therefore 13.8 and 13.0 years in the Northeast Pacific and Northwest Pacific, respectively (Tanaka 1980, Goldman 2002). Males in the Northwest Pacific were observed to 25 years of age and longevity is estimated as 20–30 years in both the Northeast and Northwest Pacific (Goldman and Musick 2008). The Salmon Shark has a moderate annual rate of population increase for the Northeast Pacific of 0.081, which is similar to that of the North Atlantic congener Porbeagle (*Lamna nasus*) (Dulvy *et al.* 2008).

**Systems:** Marine

## Use and Trade

The species is used for its meat and fins (Goldman and Musick 2008, Fields *et al.* 2018, Cardeñosa *et al.* 2018). Together with the Porbeagle, the two species accounted for 0.2% of the fin imported in Hong Kong in 2014 (Fields *et al.* 2018).

## Threats (see Appendix for additional information)

The Salmon Shark is primarily taken as bycatch in commercial and small-scale pelagic longline, purse seine, and gillnet fisheries operating in offshore and high-seas waters (Goldman and Musick 2008, Murua *et al.* 2013). It may also be captured in coastal longlines, gillnets, trammel nets and sometimes trawls, as well as by rod and reel, particularly in areas with narrow continental shelves (Camhi *et al.* 2008). The Salmon Shark was historically taken in the 1950s and 1960s in relatively large numbers (105,000–155,000 individuals per year) in open ocean gillnet fisheries that ceased operating in the early 1990s (Goldman and Musick 2008).

Salmon Sharks are sometimes retained for their meat and fins (Cardeñosa *et al.* 2018, Fields *et al.* 2018). Under-reporting of catches in the pelagic and domestic fisheries is likely (Dent and Clarke 2015). The species is currently targeted by recreational fishers, and although many practice catch and release, recreational fishing could be a threat due to post-release mortality. Post-release mortality has been reported as 10–75% on longlines for the closely-related Porbeagle (Campana *et al.* 2016).

## Conservation Actions (see Appendix for additional information)

The success of actions agreed through international wildlife and fisheries treaties depends on implementation at the domestic level; for sharks, such follow up actions have to date been seriously lacking. Beyond finning bans, there are no international conservation commitments that are directly applicable to Salmon Sharks. In Canada, the species can only be retained by recreational fishers, with a bag limit of one Salmon Shark per day per recreational fisher. The U.S. includes the species under a general Total Allowable Catch for sharks taken as bycatch in North Pacific commercial groundfish fisheries. U.S. recreational fishing for Salmon Sharks has been managed through bag limits, etc. at the state level. To ensure population health, it is recommended that Salmon Shark fishing be limited throughout their range, based on scientific advice and/or the precautionary approach. Improved reporting of catch and discard data, and promotion of safe release protocols are also advised.

## Credits

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## Bibliography

- Camhi, M.D., Pikitch, E.K. and Babcock, E.A. 2008. *Sharks of the Open Ocean: Biology, Fisheries and Conservation*. John Wiley & Sons.
- Campana, S.E., Joyce, W., Fowler, M. and Showell, M. 2016. Discards, hooking, and post-release mortality of porbeagle (*Lamna nasus*), shortfin mako (*Isurus oxyrinchus*), and blue shark (*Prionace glauca*) in the Canadian pelagic longline fishery. *ICES Journal of Marine Science* 73(2): 520–528.
- Cardeñosa, D., Quinlan, J., Shea, K.H. and Chapman, D.D. 2018. Multiplex real-time PCR assay to detect illegal trade of CITES-listed shark species. *Scientific Reports* 8: 16313.
- Carlisle, A.B., Perle, C.R., Goldman, K.J. and Block, B.A. 2011. Seasonal changes in depth distribution of salmon sharks (*Lamna ditropis*) in Alaskan waters: implications for foraging ecology. *Canadian Journal of Fisheries and Aquatic Sciences* 68(11): 1905–1921.
- Conrath, C.L., Tribuzio, C.A. and Goldman, K.J. 2014. Notes on the reproductive biology of female Salmon Sharks in the Eastern North Pacific Ocean. *Transactions of the American Fisheries Society* 143(2): 363–368.
- Dulvy, N.K., Baum, J.K., Clarke, S., Compagno, L.J.V., Cortés, E., Domingo, A., Fordham, S., Fowler, S.L., Francis, M.P., Gibson, C., Martinez, J., Musick, J.A., Soldo, A., Stevens, J.D. and Valenti, S.V. 2008. You can swim but you can't hide: the global status and conservation of oceanic pelagic sharks and rays. *Aquatic Conservation: Marine and Freshwater Ecosystems* 18(5): 459–482.
- Ebert, D.A., Fowler, S. and Compagno, L. 2013. *Sharks of the World. A Fully Illustrated Guide*. Wild Nature Press, Plymouth, United Kingdom.
- Fields, A.T., Fischer, G.A., Shea, S.K.H., Zhang, H., Abercrombie, D.L., Feldheim, K.A., Babcock, E.A. and Chapman, D.D. 2018. Species composition of the international shark fin trade assessed through retail-market survey in Hong Kong. *Conservation Biology* 32(2): 376–389.
- Goldman, K.J. 2002. Aspects of Age, Growth, Demographics and Thermal Biology of Two Lamniform Sharks. PhD thesis, College of William and Mary.
- Goldman, K.J. and Musick, J.A. 2006. Growth and maturity of salmon sharks in the eastern and western North Pacific, and comments on back-calculation methods. *Fish Bulletin* 104: 278–292.
- Goldman, K.J. and Musick, J.A. 2008. The biology and ecology of the salmon shark, *Lamna ditropis*. In: Camhi, M., Pikitch, E.K., Babcock, E.A. (ed.), *Sharks of the open ocean: Biology, fisheries and conservation*, pp. 95–104. Blackwell Science, Oxford, UK.
- Hulbert, L.B., Aires-da-Silva, A.M., Gallucci, V.F. and Rice, J.S. 2005. Seasonal foraging movements and migratory patterns of female *Lamna ditropis* tagged in Prince William Sound, Alaska. *Journal of Fish Biology* 67(2): 490–509.
- IUCN. 2019. The IUCN Red List of Threatened Species. Version 2019-3. Available at: [www.iucnredlist.org](http://www.iucnredlist.org). (Accessed: 10 December 2019).
- Murua, H., F. J. Abascal, J. Amade, J. Ariz, P. Bach, P. Chavance, R. Coelho, M. Korta, F. Poisson, M. N. Santos and Seret, B. 2013. Provision of scientific advice for the purpose of the implementation of the EUPOA sharks. Final Report. European Commission, Studies for Carrying out the Common Fisheries Policy (MARE/2010/11 - LOT 2). IOTC-2013-WPEB09-45.
- Nagasawa, K. 1998. Predation by salmon sharks (*Lamna ditropis*) on Pacific salmon (*Oncorhynchus* spp.) in the North Pacific Ocean. *North Pacific Anadromous Fish Commission Bulletin No. 1*: 419–433.

Orion Charters. 2017. Orion Charters-Shark Fishing. Available at:  
<http://www.orioncharters.com/sharks.htm>. (Accessed: 7 March 2019).

Tanaka, S. 1980. Biological investigation of *Lamna ditropis* in the north-western waters of the North Pacific [English abstract]. Report of investigation on sharks as a new marine resource (1979). Japan Marine Fishery Resource Research Center, Tokyo, Japan.

Weng, K.C., Foley, D.G., Ganong, J.E., Perle, C., Shillinger, G.L. and Block, B.A. 2008. Migration of an upper trophic level predator, the salmon shark *Lamna ditropis*, between distant ecoregions. *Marine Ecology Progress Series* 372: 253-264.

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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 -> 9.1. Marine Neritic - Pelagic                     | Resident | Suitable    | Yes               |
| 10. Marine Oceanic -> 10.1. Marine Oceanic - Epipelagic (0-200m)       | Resident | Suitable    | Yes               |
| 10. Marine Oceanic -> 10.2. Marine Oceanic - Mesopelagic (200-1000m)   | Resident | Suitable    | Yes               |
| 10. Marine Oceanic -> 10.3. Marine Oceanic - Bathypelagic (1000-4000m) | 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   | Majority (50-90%)                             | Unknown  | Low impact: 5 |
|  | 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   | Majority (50-90%)                             | Unknown  | Low impact: 5 |
|  | Stresses: | 2. Species Stresses -> 2.1. Species mortality |          |               |
| 5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.3. Unintentional effects: (subsistence/small scale) [harvest] | Ongoing   | Majority (50-90%)                             | Unknown  | Low impact: 5 |
|  | Stresses: | 2. Species Stresses -> 2.1. Species mortality |          |               |
| 5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.4. Unintentional effects: (large scale) [harvest]             | Ongoing   | Majority (50-90%)                             | Unknown  | Low impact: 5 |
|  | 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 Research, Monitoring and Planning    |
| Action Recovery plan: No                      |
| Systematic monitoring scheme: No              |
| In-Place Land/Water Protection and Management |

|  |
|--|
| <b>Conservation Actions in Place</b>                       |
| Conservation sites identified: No                          |
| Occur in at least one PA: Yes                              |
| Area based regional management plan: No                    |
| Invasive species control or prevention: Not Applicable     |
| <b>In-Place Species Management</b>                         |
| Harvest management plan: Yes                               |
| Successfully reintroduced or introduced benignly: No       |
| Subject to ex-situ conservation: No                        |
| <b>In-Place Education</b>                                  |
| Subject to recent education and awareness programmes: No   |
| Included in international legislation: No                  |
| Subject to any international management/trade controls: No |

## Conservation Actions Needed

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

|   |
|---|
| <b>Conservation Actions Needed</b>  |
| 3. Species management -> 3.1. Species management -> 3.1.1. Harvest management |

## Research Needed

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

|  |
|--|
| <b>Research Needed</b>                                     |
| 1. Research -> 1.2. Population size, distribution & trends |
| 1. Research -> 1.3. Life history & ecology                 |
| 3. Monitoring -> 3.1. Population trends                    |
| 3. Monitoring -> 3.2. Harvest level trends                 |
| 3. Monitoring -> 3.3. Trade trends                         |

## Additional Data Fields

|                             |
|-----------------------------|
| <b>Distribution</b>         |
| Lower depth limit (m): 1864 |
| Upper depth limit (m): 0    |

|                                      |
|--------------------------------------|
| <b>Habitats and Ecology</b>          |
| Generation Length (years): 13.0-13.8 |

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