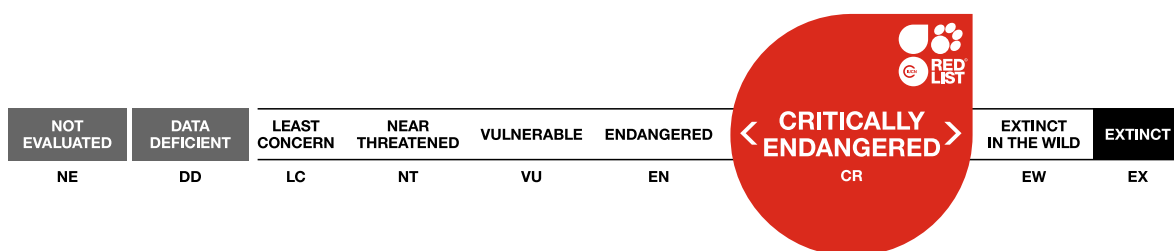


## *Tetronarce puelcha*, Argentine Torpedo

Assessment by: Pollom, R., Barreto, R., Charvet, P., Chiaramonte, G.E., Cuevas, J.M., Herman, K., Montealegre-Quijano, S., Motta, F., Paesch, L. & Rincon, G.



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## Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Chondrichthyes	Torpediniformes	Torpedinidae

**Scientific Name:** *Tetronarce puelcha* (Lahille, 1926)

### Synonym(s):

- *Torpedo puelcha* Lahille, 1926

### Common Name(s):

- English: Argentine Torpedo

### Taxonomic Source(s):

Fricke, R., Eschmeyer, W.N. and Van der Laan, R. (eds). 2020. Eschmeyer's Catalog of Fishes: genera, species, references. Updated 14 September 2020. Available at: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>.

## Assessment Information

**Red List Category & Criteria:** Critically Endangered A2bd [ver 3.1](#)

**Year Published:** 2020

**Date Assessed:** July 1, 2019

### Justification:

The Argentine Torpedo (*Tetronarce puelcha*) is a medium-sized (to 120 cm total length) ray that occurs in the Southwest Atlantic from Espírito Santo, Brazil to San Jorge Gulf, Argentina. It is benthic on the continental shelf and slope at depths of 10–600 m, and also inhabits coastal lagoons. It is captured in intense and largely unmanaged commercial and artisanal demersal trawl and gillnet fisheries, which operate throughout most of its geographic range. Individuals that are caught are typically discarded at sea, but levels of post-release mortality are unknown. On the southern Brazilian shelf, this species declined by 97% in research trawl catch-per-unit-effort (CPUE) from 340 kg/hr in the 1980s to 10 kg/hr in 2005, equivalent to a >99% reduction over three generations. There are few data from Uruguay and Argentina, but this ray is rarely caught and may have undergone a similar decline there. Overall, due to the level of intense and inadequately managed fisheries throughout most of its range, its suspected unproductive life history, and significant estimated declines in CPUE in some areas, it is suspected that the Argentine Torpedo has undergone a population reduction of >80% over the past three generations (37.5 years), and it is assessed as Critically Endangered A2bd.

### Previously Published Red List Assessments

2006 – Data Deficient (DD)

<https://dx.doi.org/10.2305/IUCN.UK.2006.RLTS.T60135A12311366.en>

## Geographic Range

**Range Description:**

The Argentine Torpedo occurs in the Southwest Atlantic from Espírito Santo, Brazil to San Jorge Gulf, Argentina (Bovcon *et al.* 2011, Last *et al.* 2016).

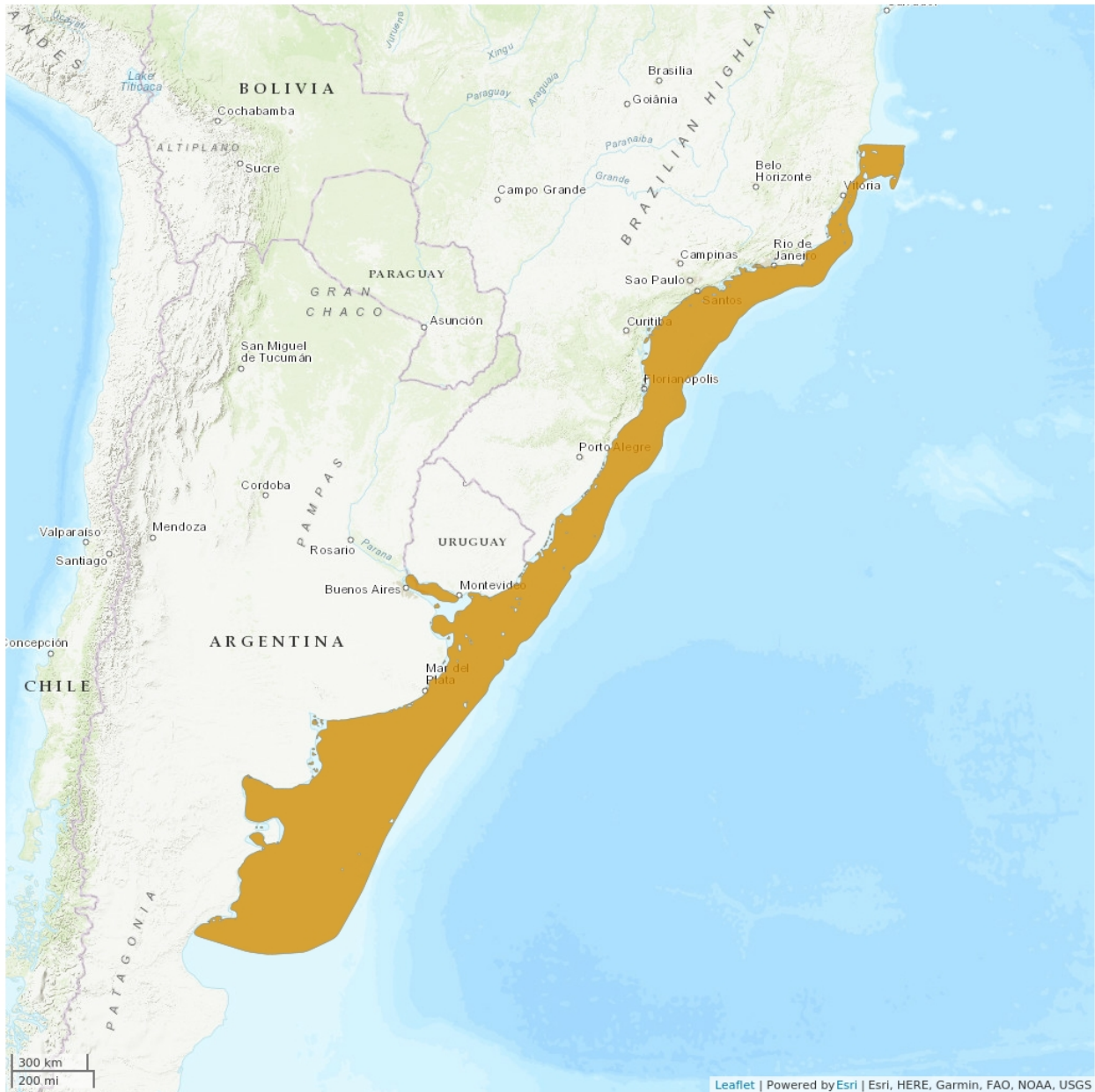
**Country Occurrence:**

**Native, Extant (resident):** Argentina; Brazil; Uruguay

**FAO Marine Fishing Areas:**

**Native:** Atlantic - southwest

# Distribution Map

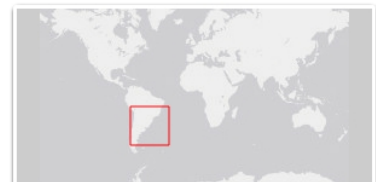
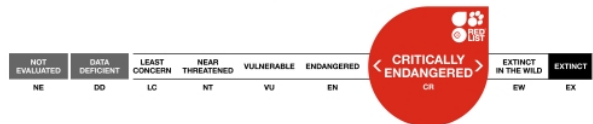


## Legend

■ EXTANT (RESIDENT)

Compiled by:

IUCN SSC Shark Specialist Group 2018



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



## Population

Inferences about population trend have been drawn from estimates of catch-per-unit-effort (CPUE) from research trawl surveys on the southern Brazilian shelf, and we confirm that this species is now rarely encountered in Argentina despite being more abundant in the past. First, on the southern Brazilian shelf, this species declined by 97% in research trawl CPUE from 340 kg/hr in the 1980s to 10 kg/hr in 2005 (Ferreira *et al.* 2010), equivalent to a >99% reduction over three generations. Second, there are few data from Argentina, but the species is now rarely caught and may have been reduced prior to recent work in the area. Overall, due to the level intense and inadequately managed fisheries throughout most of its range, its lack of refuge at depth, its relatively unproductive life history, its susceptibility to being caught in fisheries, and reported declines in CPUE, it is suspected that the Argentine Torpedo has undergone a population reduction of >80% over the past three generations (37.5 years).

**Current Population Trend:** Decreasing

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

The Argentine Torpedo is benthic on the continental shelf and upper slope at depths of 10–600 m (Last *et al.* 2016, Weigmann 2016); it also inhabits coastal lagoons (Belleggia *et al.* 2008, Petry *et al.* 2016). It reaches a maximum size of 120 cm total length (TL) and males mature at 62–67 cm TL (Last *et al.* 2016). Female size-at-maturity is unknown, but immature individuals of 77 cm TL have been recorded (Kotas *et al.* 2017). Reproduction is viviparous (Last *et al.* 2016). It is estimated to have a generation length of ~12.5 years, similar to that of the Pacific Torpedo (*Tetronarce californica*), which has an age-at-maturity of 9 years and a maximum age of 16 years (Neer and Cailliet 2001).

**Systems:** Marine

## Use and Trade (see Appendix for additional information)

This electric ray is typically discarded if caught.

## Threats (see Appendix for additional information)

The Argentine Torpedo is captured in intense and unmanaged commercial and artisanal demersal trawl and gillnet fisheries across most of its geographic range. In southern Brazil, the trawl fishery began in the 1960s and entered a period of rapid expansion in the 1990s and 2000s, resulting in over 650 vessels fishing at depths of 20–1,000 m (Port *et al.* 2016). Vessels often practice 'pair-trawling', where multiple boats link up to increase the area swept, and this species is captured in this fishery (Rotundo *et al.* 2009). Artisanal fisheries there are also intense, and 58% of stocks targeted by artisanal fishers were over-exploited by 2010, half of those being collapsed (Vasconcellos *et al.* 2011). In São Paulo state alone, there are over 300 small-scale trawl vessels (Rodrigues *et al.* 2019). From the late 1990s, deep-water fisheries along the southeast and southern coasts of Brazil developed to remove some pressure from depleted coastal resources (Perez *et al.* 2009). Four main fisheries (hook and line, benthic gillnet, pots, and benthic trawls) targeted a variety of species including monkfish (*Lophius gastrophysus*), Argentine Hake (*Merluccius hubbsi*), and deep-water shrimps (family Aristeidae) at depths of 200–1,000 m. Foreign vessels also operated in the region until 2002, fishing at depths predominately >500 m (Perez *et al.* 2009). Development of these fisheries was intense; the entire area fished for deep-water shrimp was estimated to be swept nearly twice over a three year period (2003–2006), reducing biomass estimates

of the target Scarlet Shrimp (*Aristaeopsis edwardsiana*) by up to 50% (Dallagnolo *et al.* 2009). This ray was among the most vulnerable to capture in this fishery in a productivity-susceptibility analysis (Visintin and Perez 2016).

In Uruguay, the industrial trawl fleet increased from 46 vessels in 1975 to a peak of 121 in 2004, followed by a decline to 81 vessels in 2010. During the expansion phase of this fishery, landings increased six-fold from 1975 to 1981. Subsequent depletion of these species led to a diversification of the fisheries into non-traditional (i.e. bycatch) species, masking the decline in previous target species (Lorenzo *et al.* 2015). Artisanal vessels fishing in Uruguayan waters increased from 269 vessels in 1975 to 905 vessels in 1996, and after a restructuring in 1997 the number of vessels increased from 393 to 795 in 2010 (Lorenzo *et al.* 2015). This is thought to be an underestimate, as many artisanal vessels are not registered. In Argentina, commercial fishing began in the late 1800s, became industrialized after World War II (Mateo 2006), and increased rapidly in the 1980s (Watson *et al.* 2006). By 1992 there were over 300 coastal trawlers. This number increased to over 400 in 2015, and the number of fishing trips undertaken by that fleet almost doubled from over 7,600 to nearly 14,000 over that time frame. The overall number of fishing vessels in operation in Argentina has grown from under 300 in 1990 to nearly 1,000 in 2015 (Dirección Nacional de Planificación Pesquera 2016). Although this ray is thought to be discarded when caught, post-release mortality is unknown and is suspected to be high. Overall, this torpedo ray is subjected to intense and largely unmanaged fishing pressure across its range, has little natural ability to cope with fishing mortality, and does not have refuge at depth in most areas.

## Conservation Actions (see Appendix for additional information)

This ray is listed in the Brazilian Ordinance of Ministry of the Environment No. 445, which restricts all harvest and trade of species listed as Endangered or Critically Endangered on the Brazilian National Red List, but allows for fishing with caveats for those listed as Vulnerable (Feitosa *et al.* 2018, Gadig *et al.* 2018). This legislation came into force in December 2014, however, it was suspended for all of 2015 and the first half of 2016 due to pressure from the fishing industry (Begossi *et al.* 2017). The ordinance faces increasing industry pressure, including a court challenge to suspend the legislation again, by the Secretaria Nacional de Aquicultura e Pesca (SAP), who brought forward their contention that the Brazilian National Red List was designed specifically for terrestrial species (Spautz 2019). There are no species-specific protections or conservation measures in place in Uruguay or Argentina. This torpedo ray occurs in the Punta Bermeja Natural Protected Area, where it is protected (Venerus and Cedrola 2017). To conserve the population and permit recovery, a suite of measures will be required which will need to include species protection, spatial management, bycatch mitigation, and harvest management, all of which will be dependent on effective enforcement. Further research is needed on life history and population size and trends, and species-specific monitoring is needed in both commercial and artisanal fisheries.

## Credits

- Assessor(s):** Pollom, R., Barreto, R., Charvet, P., Chiaramonte, G.E., Cuevas, J.M., Herman, K., Montealegre-Quijano, S., Motta, F., Paesch, L. & Rincon, G.
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**Facilitator(s) and Compiler(s):** Kyne, P.M., Pollom, R., Charvet, P. & Dulvy, N.K.

**Authority/Authorities:** IUCN SSC Shark Specialist Group (sharks and rays)

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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 -> 9.6. Marine Neritic - Subtidal Muddy	Resident	Suitable	Yes
11. Marine Deep Benthic -> 11.1. Marine Deep Benthic - Continental Slope/Bathyl Zone (200-4,000m)	-	-	-
13. Marine Coastal/Supratidal -> 13.4. Marine Coastal/Supratidal - Coastal Brackish/Saline Lagoons/Marine Lakes	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 -> 5.4.3. Unintentional effects: (subsistence/small scale) [harvest]	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	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%)	Slow, significant declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality		

### Conservation Actions in Place

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

Conservation Action in Place
In-place research and monitoring
Action Recovery Plan: No
Systematic monitoring scheme: No
In-place land/water protection
Conservation sites identified: No

<b>Conservation Action in Place</b>
Area based regional management plan: No
Occurs in at least one protected area: Yes
Invasive species control or prevention: Not Applicable
In-place species management
Harvest management plan: Yes
Successfully reintroduced or introduced benignly: No
Subject to ex-situ conservation: No
In-place education
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 Action Needed</b>
1. Land/water protection -> 1.1. Site/area protection
3. Species management -> 3.1. Species management -> 3.1.1. Harvest management
3. Species management -> 3.2. Species recovery
5. Law & policy -> 5.1. Legislation -> 5.1.2. National level
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.2. National level

## 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
1. Research -> 1.4. Harvest, use & livelihoods
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
3. Monitoring -> 3.1. Population trends

## Additional Data Fields

<b>Distribution</b>
Lower depth limit (m): 600
Upper depth limit (m): 10
<b>Habitats and Ecology</b>
Generation Length (years): 12.5

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