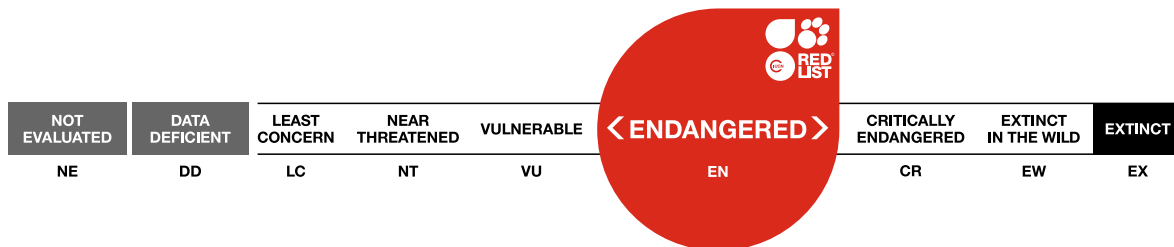


## *Dipturus trachydermus*, Roughskin Skate

Assessment by: Dulvy, N.K., Acuña, E., Bustamante, C., Chiaramonte, G.E., Concha, F., Cuevas, J.M., Herman, K., Paesch, L., Pompert, J., Rincon, G. & Velez-Zuazo, X.



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## Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Chondrichthyes	Rajiformes	Rajidae

**Scientific Name:** *Dipturus trachydermus* (Krefft & Stehmann, 1975)

### Synonym(s):

- *Dipturus trachyderma* (Krefft & Stehmann, 1975)
- *Raja trachyderma* Krefft & Stehmann, 1975

### Common Name(s):

- English: Roughskin Skate
- Spanish; Castilian: Raya Espinosa, Raya Espinuda

### Taxonomic Source(s):

Last, P., White, W., de Carvalho, M., Séret, B., Stehmann, M. and Naylor, G. 2016. *Rays of the World*. CSIRO Publishing, Clayton.

Krefft, G. and Stehmann, M. 1975. Ergebnisse der Forschungsreisen des FFS "Walter Herwig" nach Südamerika. XXXVI) Zweitere neue Rochenarten aus dem Südwest-atlantik: *Raja (Dipturus) leptocauda* und *Raja (Dipturus) trachyderma* spec. nov. (Chondrichthyes, Batoidei, Rajidae). *Archiv. Fisherei Wissenschaft* 25:77-97.

### Taxonomic Notes:

The spellings *Dipturus trachyderma* and *Dipturus trachydermus* have been used for this species. The basonym is *Raja trachyderma* and the valid name is *Dipturus trachydermus* following grammatical rules. While Fricke *et al.* (2019) use *Dipturus trachyderma*, we follow Last *et al.* (2016) which correctly uses *Dipturus trachydermus*.

## Assessment Information

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

**Year Published:** 2020

**Date Assessed:** February 8, 2019

### Justification:

The Roughskin Skate (*Dipturus trachydermus*) is a large skate (to 265 cm total length) that occurs in the Southeast Pacific and Southwest Atlantic from Coquimbo, Chile (31°S), south around Cape Horn and north to Río de la Plata, Uruguay, including the Falkland Islands (Malvinas). It is demersal on the outer continental shelf and upper slope at depths of 85–480 m, but is most commonly found at 200–350 m in Chile and shallower (80–150 m) in Argentina. It is captured in industrial trawl fisheries for hake (*Merluccius* spp.), and artisanal bottom longline fisheries that encompass nearly the entire geographic and depth range of this species in Chile and Argentina. In Chile, it was a secondary catch of the target skate fishery which ramped up in 1993 as a direct result of the arrival of Korean skate traders who provided a market that incentivised fishers to target and retain this species for international trade.

Despite quota management since 1997, the fishery peaked in around 2003 and landings started to decline until the target fisheries were closed in 2016. There may be some refuge for the species in the extensive coastline of southern Chile which consists of many fjords and canals where fishing activities are not operating at present. The current skate fishery in Chile is considered to be 'fully exploited' and the high percentage of juveniles present in catches and the decreasing trend of the catch size are symptoms of a fishing collapse. The stock assessment of the target Yellownose Skate (*Dipturus chilensis*) indicated a reduction of 73.1% over three generation lengths for that species (52.5 years), with the highest probability (95%) of 50–79% reduction over three generation lengths. In Argentina, reported landings of skates in general increased from 900 t in 1993 to a peak of 28,000 t in 2007, due to export demand from Korea. Whole small specimens and wings of larger Roughskin Skate are landed, frozen, and traded to Korea for the 'Hongo' market. There is no local consumption. Overall, this skate is subject to intense and inadequately managed fishing pressure throughout most of its range, there is little refuge at depth, it has limiting life history characteristics, and other similar species in the region have exhibited substantial population reductions. As a result, it is suspected that the Roughskin Skate has undergone a population reduction of 50–79% over the past three generations (64.5 years), and it is assessed as Endangered A2bd.

### **Previously Published Red List Assessments**

2007 – Vulnerable (VU)

<https://dx.doi.org/10.2305/IUCN.UK.2007.RLTS.T63116A12611753.en>

## **Geographic Range**

### **Range Description:**

The Roughskin Skate occurs in the Southeast Pacific and Southwest Atlantic from Coquimbo, Chile (31°S), south around Cape Horn and north to Río de la Plata, Uruguay, including the Falkland Islands (Malvinas) (Winter *et al.* 2015, Last *et al.* 2016). Records north of Río de la Plata are considered to be of doubtful validity and specimens from Brazil may be misidentifications of Menni's Skate (*Dipturus menni*) (Vargas-Caro *et al.* 2015).

### **Country Occurrence:**

**Native, Extant (resident):** Argentina; Chile; Falkland Islands (Malvinas); Uruguay

**Native, Presence Uncertain:** Brazil

### **FAO Marine Fishing Areas:**

**Native:** Atlantic - southwest

**Native:** Pacific - southeast

# Distribution Map



## Legend

■ EXTANT (RESIDENT)

Compiled by:  
IUCN SSC Shark Specialist Group 2019



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



## Population

There are no population estimates for this skate. In Chile, industrial trawl fisheries for Southern Hake (*Merluccius australis*), and artisanal bottom longline fisheries encompass the Southeast Pacific geographic and depth range of this species, with patches of refuge in southern Chile. In Argentina, this species is taken as bycatch of Red Shrimp (*Pleoticus muelleri*) trawl fisheries and of Argentinian Hake (*Merluccius hubbsi*) fisheries. These fisheries are intense, they lack adequate management measures, and this skate does not have any refuge at depth.

The Chilean target skate fishery was closed between 2013–2016 but this species is still taken as significant retained bycatch, particularly in the South Pacific Hake (*Merluccius gayi*) and artisanal longline fisheries. The current skate fishery (*Dipturus* spp.) in Chile is considered to be ‘fully exploited’ and the high percentage of juveniles present in catches, the decreasing trend of the catch size, as well as the constant fishing effort and landings, are symptoms of a fishing collapse for the Roughskin Skate, as suggested for Yellownose Skate (*Dipturus chilensis*) (Bustamante *et al.* 2012). Initial landings in late 1970s and early 1980s were due to exploratory fisheries. While variable, landings subsequently increased steadily as a direct result of the arrival of Korean skate traders in 1993, who provided a market that incentivised fishers to target and retain this species for international trade. The fishery peaked and landings started to decline after around 2003 (Vargas-Caro *et al.* 2015). The target fishery was closed in 2016.

An indication of the population trend is available from a stock assessment of the Yellownose Skate, which reveals that total biomass over 1979–2006 (27 years) exhibited annual rates of reduction of 2.5%, consistent with an estimated median reduction of 73.1% over three generation lengths (52.5 years), with the highest probability (95%) of 50–79% reduction over three generation lengths. Given that this species is large-bodied and has a similar depth distribution to the target Yellownose Skate, it is likely that the Roughskin Skate has also undergone similar declines. This species is relatively uncommon and patchily distributed and fished throughout its depth and geographic range in the Southwest Atlantic, it is suspected that the rapid rise in catches and export of skates has driven steep declines of this species in the Southwest Atlantic also.

Overall, this skate is subject to intense and inadequately managed fishing pressure throughout most of its range, there is little refuge at depth, it has limiting life history characteristics, and other similar species have exhibited substantial population reductions. It is therefore suspected that the Roughskin Skate has undergone a population reduction of 50–79% over the past three generations (64.5 years).

**Current Population Trend:** Decreasing

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

The Roughskin Skate is demersal on the outer continental shelf and upper slope at depths of 85–480 m (Last *et al.* 2016); it is most common at 180–350 m in Chile, but in Argentina it may be found much shallower at depths of 80–150 m (Vargas-Caro *et al.* 2015). It reaches as a maximum size of 265 cm total length (TL) (Licandeo *et al.* 2007); females mature at 215 cm TL and males at 195 cm TL (Licandeo *et al.*

2007). Reproduction is oviparous; an annual reproductive cycle is suspected and size-at-hatching is 20 cm TL (Endicott *et al.* 2002, Last *et al.* 2016). Female age-at-maturity is 17 years and maximum age is 26 years (Francis and Gallagher 2009); generation length is therefore estimated to be 21.5 years (Licandeo *et al.* 2007).

**Systems:** Marine

## Use and Trade

Whole small specimens and wings of larger Roughskin Skate are landed, frozen, and traded to Korea for the 'Hongoe' market. There is no local consumption.

## Threats (see Appendix for additional information)

This skate is intensively fished in both the Southeast Pacific and Southwest Atlantic Oceans. Relatively few fisheries specifically target elasmobranch fishes in Chilean waters, but among those, the Yellownose skate (*Dipturus chilensis*) and the Roughskin Skate (*Dipturus trachydermus*) are the most valuable species (Vargas-Caro *et al.* 2015). In Chile, Roughskin Skate is captured as secondary target of the target fishery for Yellownose Skate driven by export demand from Korea since 1993. Roughskin Skate faces bycatch fishing pressure since the target Yellownose Skate fishery was closed from 2013 to 2016. Formerly, this species was caught in three main fisheries in Chile: (1) the artisanal multispecies skate longline fishery off central and southern Chile which fished at depths of 180–350 m, (2) bycatch in commercial fisheries for Southern Hake (*Merluccius australis*), and (3) in artisanal bottom longline fisheries for Pink Cusk-eel (*Genypterus blacodes*), however, this latter fishery catches relatively few individuals. Landings of Roughskin Skate may have been underestimated as the largest individuals (>10 kg) were 'winged' while the target Yellownose Skate were landed whole (Lamilla *et al.* 2005). The largest animals (e.g., greater than 30 kg) may be cut-off and discarded alive rather than brought on board, because of the large size and difficulty in handling these animals (C. Bustamante pers. comm. 2019).

Since 1979, there were industrial and artisanal landings in Chile of >4,000 tonnes per year of six skate species with the catch dominated by Yellownose Skate and Roughskin Skate. These two species were not separated in catch landing statistics until 2003 (Vargas-Caro *et al.* 2015). Between 1999 and 2000 there was an important increase in mainly artisanal landings with a maximum landing of 4,151 t during 2000, which then dropped to 3,000 t in 2001 and has been declining since (Vargas-Caro *et al.* 2015). South of 41°28.6'S, both Yellownose Skate and Roughskin Skate are taken as bycatch in commercial fisheries for Southern Hake and in artisanal fisheries for Pink Cusk-eel. Captures in 2002 were ~2,000 t for both Yellownose Skate and Roughskin Skate combined, and since 2005, there have been quotas put in place in these southern fishing grounds. Before the fishery was closed, in the artisanal multispecies longline fishery off central and southern Chile (39°15' to 41°28.6'S), the catch was regulated by quota for Yellownose Skate and Roughskin Skate. Since 2000, 30% of artisanal landings within this fishery (between IX and X Regions) have been monitored and comprise 85% Yellownose Skate, 10% Roughskin Skate, with the remaining 5% made up of Whitedotted Skate (*Bathyraja albomaculata*), Broadnose Skate (*B. brachyurops*), Graytail Skate (*B. griseocauda*), and Brazilian Skate (*Rajella sadowskii*) (Lamilla *et al.* 2010). The artisanal directed bottom longline fishery for Yellownose Skate has been closed since 2016. Landings are not allowed, but the bottom longline gear continues to be used and the Roughskin Skate may still be captured.

There is some refuge off southern Chile, which consists of many fjords and canals where fishing

activities are not operating at present. Artisanal fishing activities in the area generally only operate close to small towns such as Chiloé, Aysén, and Punta Arenas.

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 nearly 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). In Argentina, reported landings of skates in general increased from 900 t in 1993 to a peak of 28,000 t in 2007, and then declined to 24,000 t in 2009–2010 (Ministerio de Agricultura Ganadería y Pesca 2010, cited in Estalles *et al.* 2011). Skates and rays are caught mainly as bycatch by industrial bottom trawlers targeting Argentinian Hake and Patagonian Red Shrimp, although since 1999 they have also been targeted by a longliner with a maximum allowable catch of 1,800 t per year (Estalles *et al.* 2011). This species is taken as bycatch of the Red Shrimp fishery captured in 9.3% of hauls in double beam trawls at depths of 87–97 m (Cedrola *et al.* 2005). This species is now rare in the Patagonian Sea and typically found slightly deeper than the 100 m isobath at the southern Gulf of San Jorge.

This species is infrequently captured in the Falkland Islands (Malvinas) (Arkhipkin *et al.* 2012, Winter *et al.* 2015).

## **Conservation Actions (see Appendix for additional information)**

There are no conservation measures in place for this skate. In Chile, while catches of Yellownose Skate are regulated by annual total quota, there is no regulation of Roughskin Skate catches. Regulations and management tools utilised need to be species-specific, due to differing life histories and abundance patterns of these two skates. In Argentina, the assessment of direct and indirect catches is a priority. Further research is needed on life history, population size and trend, and threats. Species-specific management measures are needed across its range, and recovery actions may be necessary.

## **Credits**

**Assessor(s):** Dulvy, N.K., Acuña, E., Bustamante, C., Chiaramonte, G.E., Concha, F., Cuevas, J.M., Herman, K., Paesch, L., Pompert, J., Rincon, G. & Velez-Zuazo, X.

**Reviewer(s):** Pollom, R. & Kyne, P.M.

**Contributor(s):** Lamilla, J. & Massa, A.

**Facilitator(s) and Compiler(s):** Kyne, P.M., Pollom, R., Mejía-Falla, P.A., Navia, A.F. & Dulvy, N.K.

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

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*Argentina y Americana "Dr. Emilio Ravignani"* 29(3): 119–150.

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## Appendix

### Habitats

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

Habitat	Season	Suitability	Major Importance?
9. Marine Neritic -> 9.3. Marine Neritic - Subtidal Loose Rock/pebble/gravel	-	Unknown	-
9. Marine Neritic -> 9.4. Marine Neritic - Subtidal Sandy	-	Unknown	-
9. Marine Neritic -> 9.5. Marine Neritic - Subtidal Sandy-Mud	-	Unknown	-
9. Marine Neritic -> 9.6. Marine Neritic - Subtidal Muddy	-	Unknown	-
11. Marine Deep Benthic -> 11.1. Marine Deep Benthic - Continental Slope/Bathyl Zone (200-4,000m)	-	Suitable	-

### Use and Trade

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

End Use	Local	National	International
Food - human	No	No	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	-	-	Low impact: 3
	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	-	-	Low impact: 3
	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	-	-	Low impact: 3
	Stresses:	2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.4. Unintentional effects: (large scale) [harvest]	Ongoing	-	-	Low impact: 3
	Stresses:	2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		

## Conservation Actions in Place

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

<b>Conservation Action in Place</b>
In-place research and monitoring
Action Recovery Plan: No
Systematic monitoring scheme: No
In-place land/water protection
Area based regional management plan: No
Occurs in at least one protected area: Unknown
Invasive species control or prevention: Not Applicable
In-place species management
Harvest management plan: No
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>
3. Species management -> 3.1. Species management -> 3.1.1. Harvest management
3. Species management -> 3.1. Species management -> 3.1.2. Trade management
3. Species management -> 3.2. Species recovery

## 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

<b>Research Needed</b>
1. Research -> 1.5. Threats
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
2. Conservation Planning -> 2.3. Harvest & Trade Management Plan
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): 480
Upper depth limit (m): 85
<b>Habitats and Ecology</b>
Generation Length (years): 21.5

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