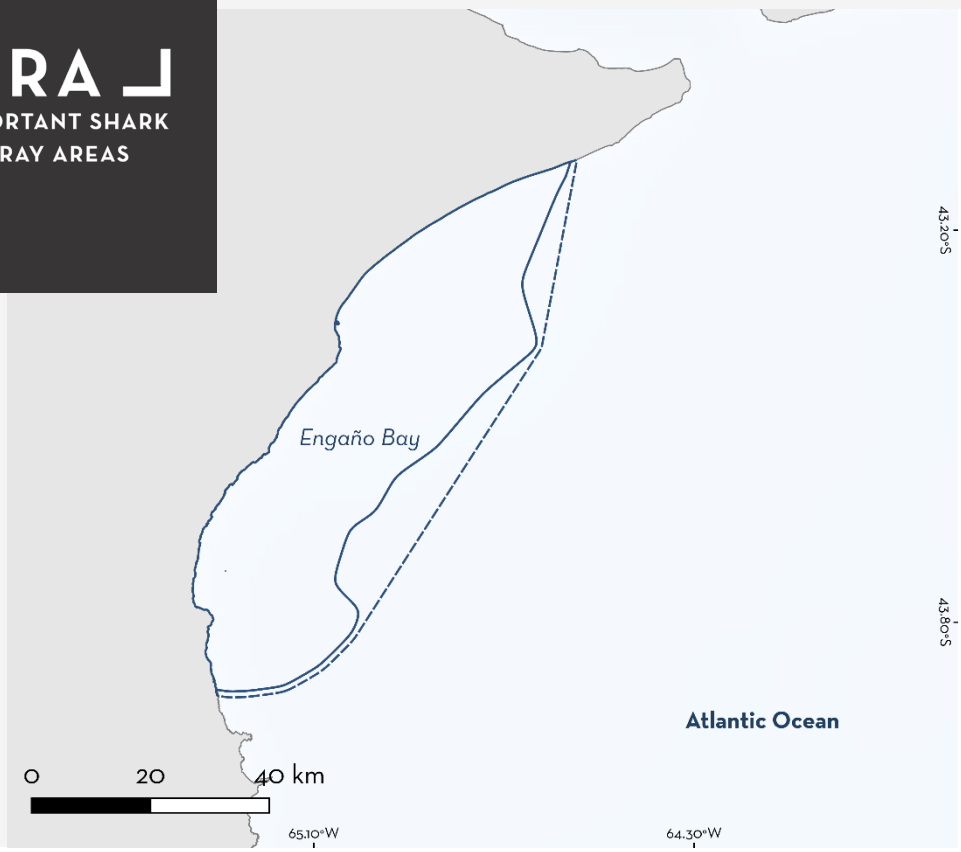
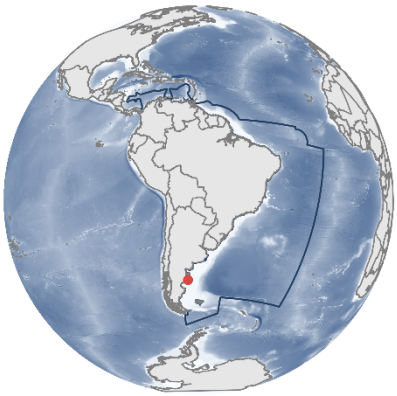
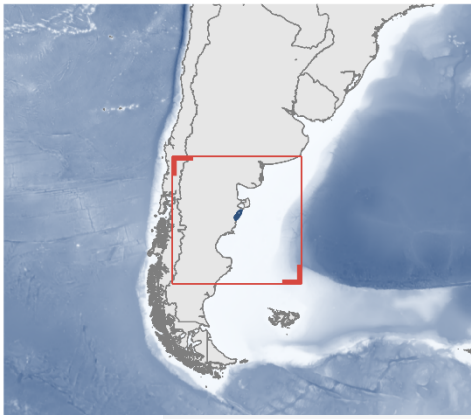
ISRA
IMPORTANT SHARK AND RAY AREAS







Blue lines indicate the area meeting the ISRA Criteria; dashed lines indicate the suggested buffer for use in the development of appropriate place-based conservation measures

ENGAÑO BAY ISRA

South American Atlantic Region

ARGENTINA

0–50 metres

2,218.3 km²

SUMMARY

Engaño Bay is located on the north coast of Chubut province in Argentina. It is situated on the Patagonian continental shelf and encompasses the Chubut River mouth. The area is characterised by sand, mud, and gravel substrates, with patches of rocky areas. It is influenced by mesoscale currents, associated with the tidal front North Patagonian Frontal System, and high productivity due to the Chubut River estuary. Within the area there are: **threatened species** (e.g., Angular Angelshark *Squatina guggenheim*) and **reproductive areas** (e.g., Tope *Galeorhinus galeus*).

CRITERIA

Criterion A – Vulnerability; Sub-criterion C1 – Reproductive Areas

DESCRIPTION OF HABITAT

Engaño Bay is located on the north coast of Chubut province in Argentina. It is situated on the Patagonian continental shelf and encompasses the Chubut River mouth. It is characterised by sand, mud, and gravel substrates, with patches of rocky areas (Van der Molen & Caille 2001). The area is influenced by mesoscale currents, associated with the tidal front North Patagonian Frontal System, which begins to form in early austral spring, coinciding with the increase in solar heating (Sabatini & Martos 2002). The dynamics of this frontal system leads to high nutrient availability in the region, primarily due to upwelling and concentration processes, which enhance primary and secondary productivity (Chidichimo et al. 2022). The southern part of Engaño Bay is an estuarine area where the Chubut River contributes a significant amount of nutrients, detritus, and phytoplankton (Santinelli & Esteves 1993).

This Important Shark and Ray Area is benthic and pelagic and is delineated from inshore and surface waters (0 m) to 50 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

Five Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occur in the area. Threatened sharks comprise two Critically Endangered species and one Endangered species; threatened rays comprise one Critically Endangered species; threatened chimaeras comprise one Vulnerable species (IUCN 2025).

SUB-CRITERION C1 – REPRODUCTIVE AREAS

Engaño Bay is an important reproductive area for three shark, three ray, and one chimaera species.

Tope, Narrownose Smoothhound, Angular Angelshark, Apron Numbfish, Bignose Fanskate, Smallnose Fanskate, and American Elephantfish neonates and young-of-the-year (YOY) are regularly captured in the area.

Across 2007, 2009, 2011, and 2012, surveys of shore recreational and sport fishing were conducted. Data were gathered from catches by recreational anglers and from fishing tournaments held in the area (Bovcon et al. 2018). Tope specimens were measured from the tip of the snout to the upper lobe of the caudal fin (total length [TL]). Neonates were identified by their size, the presence of an open umbilical scar, and spots on the tips of the dorsal and caudal fins, which resemble markings seen on term embryos in Tope pregnant females (J Cuevas pers. comm. 2018). A total of 58 Tope neonates were collected in 2007 (n = 1 individuals), 2009 (n = 3), 2011 (n = 8), 2012 (n = 46) ranging in size from 26.5–42.2 cm TL (Bovcon et al. 2018). Neonates had an even sex ratio comprising 29 females and 29 males (Bovcon et al. 2018). The size-at-birth for this species ranges from 30–40 cm TL (Ebert et al. 2021). The area serves as a seasonal pupping area for Tope, with neonates primarily captured between December–April, aligning with the presence of adults caught from January to March (Bovcon et al. 2018; Bovcon et al. 2022). Additionally, adult and juvenile Tope ranging from 65–144 cm TL are commonly captured by recreational anglers and commercial fishers in this area from September–April and occasionally in June (Bovcon 2016; Bovcon et al. 2018; Ruibal Nuñez 2020). The presence of neonates over multiple years and sampling periods supports the areas role as a reproductive area, meeting the criteria for a nursery area (as proposed by Heupel et al. 2007). This

area is the only reported breeding area for Tope throughout its distribution in the southwestern Atlantic.

Between 2010–2018, an official monitoring program was carried out in Chubut province by scientific observers onboard commercial trawl fishing vessels targeting Argentine Red Shrimp *Pleoticus muelleri* and Argentine Hake *Merluccius hubbsi* (Ruibal Nuñez 2020). During fishing operations covering an area of >181,500 km^2, incidental captures of Narrownose Smoothhound, Angular Angelshark, Apron Numbfish, Smallnose Fanskate, Bignose Fanskate, and American Elephantfish, among other species, were randomly sampled. Data on the date, depth, coordinates, and species identification were recorded (Ruibal Nuñez 2020). Neonates were identified based on their size and the presence of an open umbilical scar (Ruibal Nuñez 2020). Additionally, between 2016–2017, information from research cruises carried out in the area and adjacent waters, and information from fishing tournaments and recreational fisheries from shore between 2007–2018 were also collated (Bovcon 2016; Ruibal Nuñez 2020).

Between December 1995 to March 1996, surveys by scientific observers onboard the commercial bottom trawl shrimp fishery using a 60 mm mesh size were carried out in the area (Van der Molen & Martin-Caille 2001). Narrownose Smoothhounds were measured and sexed, and neonates were recorded based on size and stomach contents (Van der Molen & Martin-Caille 2001). A total of 65 Narrownose Smoothhound neonates (100% of all captured individuals), ranging in size between 16.7–30.1 cm TL were captured in the area with a peak during December (Van der Molen & Martin-Caille 2001). Size-at-birth for the species is between ~24–36 cm TL with animals maturing at 45–80 cm TL (Ebert et al. 2021). Additionally, according to the official monitoring of commercial trawl fisheries and the sport and recreational fishery between 2010–2018, a total of 84 Narrownose Smoothhound neonates (14.3% of all captured individuals, n = 586) were captured, with immature individuals comprising 71.6% of captures (Ruibal Nuñez 2020; Navoa et al. 2024). Narrownose Smoothhounds ranged between 23.6–92.3 cm TL (Ruibal Nuñez 2020). While neonates and YOY/juveniles were captured throughout the Gulf of San Jorge and offshore waters, more than ~75% of the records were from the area (Ruibal Nuñez 2020; Navoa et al. 2024). Distinct size modes were identified for both sexes for neonates ranging between 25–30 cm TL, and for YOY ranging between 40–45 cm TL, while adults presented two size modes for males and one for females (Ruibal Nuñez 2020). Neonates were captured between November–April but captures peaked between December–January. Neonates and YOY/juveniles were captured in the same area between 23–55 m depth (Ruibal Nuñez 2020). Pregnant females with full-term embryos were also captured in the coastal areas as early as October, during this period (Ruibal Nuñez 2020; Bovcon et al. 2022).

Between 2010–2018, based on the official monitoring of commercial trawl fisheries and the sport and recreational fishery, a total of 43 Angular Angelshark neonates (30% of all captured individuals, n = 143) were captured, with immature individuals comprising the 90.7% of captures (Bovcon et al. 2019; Ruibal Nuñez 2020). Individuals ranged between 21–97 cm TL (Ruibal Nuñez 2020). Size-at-birth of this species in the region is 20–26.5 cm TL and size-at-maturity is 70 cm TL (Colonello et al. 2007). While neonates and YOY/juveniles were captured throughout the area and offshore waters of Engaño Bay, more than 60% of the records were within this area (Ruibal Nuñez 2020). Most individuals were smaller than 45 cm TL, with a distinct size mode of 25 cm TL for males, and 26 cm TL for females (Ruibal Nuñez 2020), indicating that many individuals were neonates or YOY. Neonates were captured from August–April, and females with full-term embryos were regularly captured incidentally in the area (Bovcon et al. 2019; Ruibal Núñez 2020). This area represents the southernmost records of neonate and YOY Angular Angelsharks (Bovcon et al. 2019; Ruibal Núñez 2020).

Between 2010–2018, based on the official monitoring of commercial trawl fisheries and the sport and recreational fishery, a total of 74 Apron Numbfish neonates (11.8% of all captured individuals, n = 634)

were captured, with immature individuals comprising 66.8% of the captures (Bovcon et al. 2019; Ruibal Nuñez 2020). Individuals ranged between 8–53 cm TL (Ruibal Nuñez 2020). Size-at-birth of this species is 8–10 cm TL (Estalles et al. 2011; Last et al. 2016). While neonates and YOY/juveniles were captured throughout the area and offshore waters of Engaño Bay, more than ~50% of the observations were recorded in the area (Ruibal Nuñez 2020). Pregnant females (n = 9) with mid-term embryos were captured in autumn to early spring, while neonates were captured between March–April. Spring and summer were proposed as the breeding season for the Apron Numbfish in the area (Ruibal Nuñez 2020).

Between 2010–2018, based on the official monitoring of commercial trawl fisheries, a total of 52 Bignose Fanskate egg cases with 46 embryos inside were captured in the area. Although neonates were not captured in the area or the broader region, immature individuals comprised 86% of the captures (n = 79 total captures) (Bovcon et al. 2019; Ruibal Nuñez 2020). Individuals ranged between 12.3–50.5 cm TL (Ruibal Nuñez 2020). The size-at-birth for the species in the region is 4.9–10.9 cm TL (Oddone & Vooren 2004), indicating that some of the individuals were YOY. While YOY/juveniles were captured throughout the area and offshore waters of Engaño Bay, more than ~80% of records were from within the area at depths between 30–45 m depth (Ruibal Nuñez 2020). Egg cases with near-term embryos were captured during September–March (Ruibal Nuñez 2020). Females carrying eggs were also observed during these months, with egg capsules containing incipient or underdeveloped embryos (Ruibal Nuñez 2020).

Between 2010–2018, based on the official monitoring of commercial trawl fisheries and the sport, a total of 38 Smallnose Fanskate egg cases with 26 embryos inside were captured with more than ~90% of the records recorded in the area at depths ranging from 20–50 m (Ruibal Nuñez 2020). Additionally, a total of 39 Smallnose Fanskate neonates (8.5% of all captured individuals, n = 453) were captured, with immature individuals comprising 83.4% of the captures (Bovcon et al. 2019; Ruibal Nuñez 2020). Individuals ranged between 12.3–76 cm TL (Ruibal Nuñez 2020). The size-at-birth for the species in the region is 8–20 cm TL (Janez & Sueiro 2007). Distinct size modes were identified for female YOY ranging between 20–40 cm TL, and for male YOY ranging between 20–30 cm TL (Ruibal Nuñez 2020). While neonates and YOY/juveniles were captured throughout the area and offshore waters of Engaño Bay, more than ~75% of the records were from within the area in <60 m depth (Ruibal Nuñez 2020). Neonates were recorded from late winter to early summer (with a peak between November–February), while females carrying eggs in different stages were recorded between September–March (Ruibal Nuñez 2020). November–February was proposed as the laying season for the Smallnose Fanskate in the area (Ruibal Nuñez 2020).

Between May 2008 and March 2010, in the sport and recreational fishery, a total of 14 American Elephantfish neonates (1% of all captured individuals, n = 1,411) were recorded, all within the area (Bovcon 2016; Bovcon et al. 2019). American Elephantfish size was measured from the tip of the rostrum (with the rostral appendix squashed) to the beginning of the upper lobe of the caudal fin (SL modified; SLmod) (Bovcon 2016; Bovcon et al. 2019; Ruibal Nuñez 2020). The size-at-birth for the species is 13 cm TL (which corresponds to ~10 cm SLmod; Ruibal Nuñez 2020), while maturity is reached between 43–50 cm SL (Finucci & Cuevas 2020). Sizes ranged from 9.5–57.5 cm SLmod, and most individuals were YOY or juveniles (78.4%, n = 1,106) (Bovcon 2016). Further, between 2010–2018, a total of 696 American Elephantfish neonates (42% of all captured individuals, n = 1,656) were recorded in commercial fisheries, along with 331 YOY and juveniles (20% of total catch). While neonates and YOY/juveniles were captured throughout the Gulf of San Jorge and offshore waters, more than ~75% of the records were from this area (Ruibal Nuñez 2020). Their size ranged from 4.8–84 cm SLmod (Ruibal Nuñez 2020). Two distinct size modes were identified for both sexes, one for neonates and YOY at 10.8 cm and 11 cm SLmod, respectively, and another for adults, measuring 55 cm SLmod in females and 46 cm SLmod in males (Ruibal Nuñez 2020). Additionally, a total of 59

American Elephantfish egg cases were collected during commercial fishing and research cruises between 2010–2018, at depths between 20–50 m, with near-term embryos collected between October–December (Ruibal Nuñez 2020). Neonates and YOY/juveniles were present in the area from August–April with the highest abundances between October–January, while adults of both sexes gather in coastal areas from October–April for mating (Bovcon 2016; Bovcon et al. 2019; Ruibal Nuñez 2020). Presence of mating was inferred from observations of adult females with marks from the males' pelvic claspers and tentacle and the presence of bright green spermatophores in the females' cloaca (evidence of copulation) (Bovcon 2016; Bovcon et al. 2019; Ruibal Nuñez 2020). Females carrying egg capsules were recorded from November–March in the same areas where neonates and egg cases were collected (Bovcon 2016; Bovcon et al. 2019). The presence of egg capsules in the females' uterus suggests that oviposition occurs near the coast in the area, as egg capsules with embryos were found along the shoreline after strong waves in Bajo de los Huesos, Playa Unión, and Playa Santa Isabel, all within the area (Bovcon 2016).

Acknowledgments

Nelson Darío Bovcon (Instituto Multidisciplinario para la Investigación y Desarrollo Productivo y Social de la cuenca del Golfo San Jorge; Instituto de Investigación de Hidrobiología, Facultad de Ciencias Naturales y Ciencias de la Salud, Universidad Nacional de la Patagonia San Juan Bosco), Pablo Daniel Cochia (Instituto de Investigación de Hidrobiología, Facultad de Ciencias Naturales y Ciencias de la Salud, Universidad Nacional de la Patagonia San Juan Bosco), María Lourdes Estalles (Dirección Nacional de Áreas Marinas Protegidas- Administración de Parques Nacionales), Paula Cedrola (Dirección Nacional de Áreas Marinas Protegidas- Administración de Parques Nacionales), Andrés J Jaureguizar (Comisión de Investigaciones Científicas – Universidad Provincial del Sudoeste), Alejo J Irigoyen (Fish Ecology Lab – Centro para el Estudio de Sistemas Marinos – Centro Nacional Patagónico), Gaston Trobbiani (Fish Ecology Lab – Centro para el Estudio de Sistemas Marinos – Centro Nacional Patagónico), Pablo J Merlo (Fish Ecology Lab – Centro para el Estudio de Sistemas Marinos – Centro Nacional Patagónico), Lucas E Beltramino (Fundación Rewilding Argentina), and Marta D Palacios (IUCN SSC Shark Specialist Group – ISRA Project) contributed and consolidated information included in this factsheet. We thank all participants of the 2025 ISRA Region 05 – South American Atlantic workshop for their contributions to this process.

This factsheet has undergone review by the ISRA Independent Review Panel prior to its publication.

This project was funded by the Shark Conservation Fund, a philanthropic collaborative pooling expertise and resources to meet the threats facing the world's sharks and rays. The Shark Conservation Fund is a project of Rockefeller Philanthropy Advisors.

Suggested citation

IUCN SSC Shark Specialist Group. 2025. Engaño Bay ISRA Factsheet. Dubai: IUCN SSC Shark Specialist Group.

QUALIFYING SPECIES

Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
SHARKS												
Galeorhinus galeus	Tope	CR	0–826	X		X						
Mustelus schmitti	Narrownose Smoothhound	CR	2–195	X		X						
Squatina guggenheim	Angular Angelshark	EN	7–150	X		X						
RAYS												
Discopyge tschudii	Apron Numbfish	LC	10–181			X						
Sympterygia acuta	Bignose Fanskate	CR	0–188	X		X						
Sympterygia bonapartii	Smallnose Fanskate	NT	0–500			X						
CHIMAERAS												
Callorhinchus callorynchus	American Elephantfish	VU	10–481	X		X						

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Alopias superciliosus	Bigeye Thresher	VU
Carcharhinus brachyurus	Copper Shark	VU
Echinorhinus brucus	Bramble Shark	EN
Notorynchus cepedianus	Broadnose Sevengill Shark	VU
RAYS		
Atlantoraja castelnaui	Spotback Skate	CR
Atlantoraja cyclophora	Eyesspot Skate	EN
Bathyraja macloviana	Patagonian Skate	NT
Myliobatis goodei	Southern Eagle Ray	VU
Myliobatis ridens	Shortnose Eagle Ray	CR
Psammobatis bergi	Blotched Sandskate	LC
Psammobatis extenta	Zipper Sandskate	LC
Psammobatis lentiginosa	Freckle Sandskate	LC
Psammobatis normani	Shortfin Sandskate	LC
Zapteryx brevirostris	Shortnose Guitarfish	EN
Zearaja brevicaudata	Shorttail Yellownose Skate	VU

IUCN Red List of Threatened Species Categories are available by searching species names at www.iucnredlist.org Abbreviations refer to: CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern; DD, Data Deficient.

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