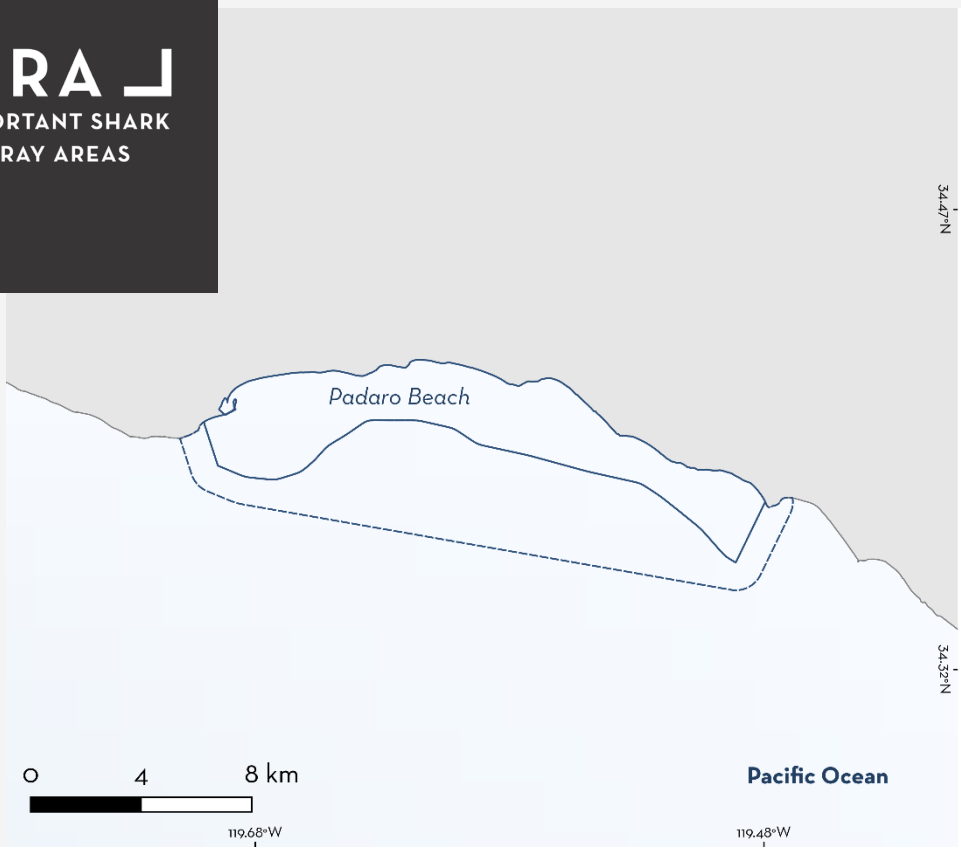
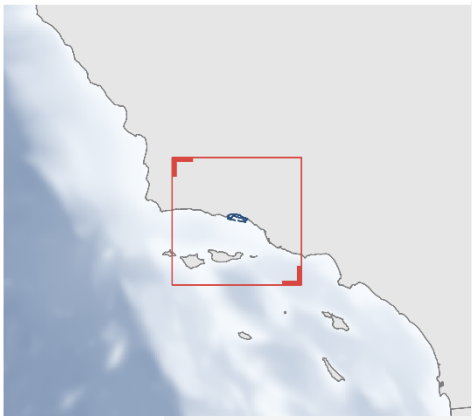
ISRA
IMPORTANT SHARK AND RAY AREAS





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

PADARO BEACH ISRA

North American Pacific Region

UNITED STATES OF AMERICA

0–12 metres

48.63 km²

SUMMARY

Padaro Beach is located in southern California, United States of America. The area is situated in the Southern California Bight. The habitat is characterised by sandy substrates and rocky reefs. It is influenced by the California Current, local winds, and coastal upwelling during the boreal spring. Within this area there are: **threatened species** (White Shark *Carcharodon carcharias*); **range-restricted species** (e.g. Bat Ray *Myliobatis californicus*); **reproductive areas**, **feeding areas**, and **resting areas** (White Shark).

CRITERIA

Criterion A – Vulnerability; Criterion B – Range Restricted;
Sub-criterion C1 – Reproductive Areas; Sub-criterion C2 – Feeding Areas;
Sub-criterion C3 – Resting Areas

DESCRIPTION OF HABITAT

Padaro Beach is located in southern California, United States of America. The area is situated in the Southern California Bight, in Santa Barbara County. It is a sandy beach stretching ~5.5 km of shoreline and includes rocky reefs and an estuary inlet. It is considered a low wave energy area (Spurgeon et al. 2022).

The area is influenced by the California Current, a surface current carrying water equatorward along the North America coast and is characterised by low temperatures, low salinities, and high dissolved oxygen (Lynn & Simpsons 1987). Local surface winds, coastal upwelling during the boreal spring, local surface heating, and topography produce high variability in stratification, thermocline depth, and micro-scale cells of water (Di Lorenzo 2003). Seafloor water temperatures range between 10.9–23.8°C while surface water temperatures range between 12.1–25.2°C (Spurgeon et al. 2022, 2024).

This Important Shark and Ray Area is benthic and pelagic and is delineated from inshore and surface waters (0 m) to 12 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

One Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occurs in the area. This is the Vulnerable White Shark (Rigby et al. 2022).

CRITERION B – RANGE RESTRICTED

This area holds the regular presence of Leopard Sharks and Bat Rays as resident range-restricted species. These species have been regularly recorded year-round during surveys conducted between 1998–2024 in this area although not all the catches from these surveys have been quantified (Jahn 2024; Samara-Chacón et al. 2025a; CSULB Shark Lab unpubl. data 2024). These species were recorded in the area between 2022–2023 in beach seines tows (n = 210) and baited remote underwater video station (BRUVS) surveys (n = 196; Jahn 2024). These surveys were conducted monthly across five beaches along the southern California coast with seine net (30 x 3 m; 7 cm mesh size) surveys in the surf zone at depths ~3 m. Leopard Sharks were recorded only inside this area during seine net surveys and MaxN (maximum number of individuals of a species observed in a single frame) on BRUVS was higher here (MaxN = 10) than in other areas and also showed higher residency during summer. Leopard Shark aggregations were also recorded during White Shark drone surveys conducted in the area (CSULB Shark Lab unpubl. data 2026). Bat Ray abundances in seine surveys inside this area were higher (~50 individuals/survey) than in outside areas (~10 individuals/survey).

These two species are restricted to the California Current Large Marine Ecosystem (LME) and the Gulf of California LME.

SUB-CRITERION C1 – REPRODUCTIVE AREAS

Padaro Beach is an important reproductive area for one shark species.

Data from fishery catches, satellite and acoustic telemetry monitoring, unmanned aerial vehicle (UAV) surveys, and environmental DNA (eDNA) surveys have confirmed the regular presence of

White Sharks in the area (Lowe et al. 2012; Anderson et al. 2021; Rex et al. 2023; McCauley et al. 2024; Merson et al. 2025). These data indicate that southern California contains spatiotemporally dynamic centres of primary and secondary nursery habitat for young-of-the-year (YOY) and juvenile White Sharks. Juveniles form aggregations at locations that are inter-annually variable along the coast, with individuals exhibiting increased site fidelity, residency levels, and spatially restricted movements for periods up to eight years (Anderson et al. 2021). Padaro Beach represents the largest and interannually most reliable site in which such YOY and juvenile White Shark aggregations are regularly and predictably observed (Lowe et al. 2012; Anderson et al. 2021; Rex et al. 2023; McCauley et al. 2024).

Catch data from multiple fisheries operating in nearshore waters between 1936–2009 revealed that the broader area of the Southern California Bight is a nursery area for White Sharks (Lowe et al. 2012). Of 369 records, 39% (n = 144) were neonate/YOY measuring <175 cm total length (TL; Cailliet et al. 1985; Malcolm et al. 2001), 21% (n = 77) were juveniles, 5% (n = 18) were adults, and the rest were of unreported size. Inside the Southern California Bight, Padaro Beach was identified as the largest hotspot for catches of YOY White Sharks with individuals caught mostly in spring and summer (Lowe et al. 2012).

Between 2010–2026, the California State University – Long Beach (CSULB) Shark Lab tagged 378 White Sharks across southern California. Of these, 40 (10.6%) were neonate (<150 cm TL; Ebert et al. 2021), 61 (16.1%) were YOY, and 243 (64.3%) were juveniles at the time of tagging (CSULB Shark Lab unpubl. data 2026). Of these, 149 (39.4%) were tagged off Padaro Beach with 12 (8.0%) categorised as YOY and 122 (82.0%) as juveniles measuring between 176–300 cm TL at the time of tagging (CSULB Shark Lab unpubl. data 2026). There was a total of 10,081,032 detections at the Padaro Beach aggregation site from 169 unique White Sharks, including YOY and juveniles tagged at other aggregation sites from 2010 to 2026. This area was determined as a hotspot for residency of YOY animals (Anderson et al. 2021). In addition, drone survey data of this aggregation area indicated up to 40 individuals (150–300 cm TL) present at one time which was confirmed from acoustic telemetry tracking of tagged individuals (Rex et al. 2023).

SUB-CRITERION C2 – FEEDING AREAS

Padaro Beach is an important feeding area for one shark species.

Stable isotope analysis and faecal DNA of juvenile White Sharks (n = 70) revealed that they regularly feed in the area. Individuals sampled between 2021–2023 in this area and potential prey (20 species) indicated that coastal and benthic bony fishes (47%) and sharks and rays (20%) caught inside the area had the highest contribution to their diet compared to potential prey collected outside the area (Samara Chacon et al. 2025a, 2025b). Juvenile White Sharks are known to feed on benthic prey in southern California (Lowe et al. 2012). In addition, beach seines, BRUVS surveys, and DNA metabarcoding analyses conducted during those same years, revealed that the main prey for juvenile White Sharks, which include small sharks and rays (e.g., Haller's Round Ray *Urobatis halleri*, Bat Ray *Myliobatis californica*) and benthic bony fishes (e.g., California Flounder *Paralichthys californicus*) are more abundant in the area than in areas not used by immature White Sharks (Merson et al. 2025; Samara Chacon et al. 2025a, 2025b; CSULB Shark Lab unpubl. data 2026). In addition, community structure of prey between areas used by immature White Sharks were more similar to each other than with areas not used by White Sharks (Jahn 2024). Juvenile White Sharks are highly resident to this nursery habitat which seems to be influenced by a high prey abundance. Nursery areas are dynamic across time and the evidence suggests that White Sharks are potentially driving down these prey populations within this fish community over time, which likely leads to White Sharks leaving the aggregation and coming back to them once prey populations rebuild (Merson et al. 2025; Samara

Chacon et al. 2025a, 2025b; CSULB Shark Lab unpubl. data 2026). Reductions in more highly preferred prey abundance (e.g., benthic sharks, rays, and bony fishes) and changes in environmental condition drive selection of these nursery aggregation sites (Spurgeon et al. 2022; CSULB Shark Lab unpubl. data 2026).

SUB-CRITERION C3 – RESTING AREAS

Padaro Beach is an important resting area for one shark species.

Acoustic telemetry indicates that YOY and juvenile White Sharks spend weeks to months in this area (Anderson et al. 2022). Fine-scale acoustic tracking of over 100 tagged juvenile White Sharks between 2020–2025 was used to estimate swim speeds and metabolic rates (Anderson et al. 2022; CG Lowe et al. unpubl. data 2025). Tagged individuals exhibited periods during the day of exceedingly slow swim speeds (<1 m/s) and circling, indicative of resting behaviour (Anderson et al. 2022; CG Lowe et al. unpubl. data 2025). This is further supported by biologging data providing higher resolution of the overall dynamic body acceleration and circling while at aggregation sites as opposed to individuals transiting between aggregation sites (CSULB Shark Lab unpubl. data 2026). This slow cruising behaviour allows juveniles to utilise environmental temperature profiles to maintain homeostasis and optimise metabolic efficiency and therefore maximise the potential for growth at early life-stages (Anderson et al. 2022; Spurgeon et al. 2024).

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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												
Carcharodon carcharias	White Shark	VU	0–1,277	X		X	X	X				
Triakis semifasciata	Leopard Shark	LC	0–156		X							
RAYS												
Myliobatis californicus	Bat Ray	LC	0–1,277		X							

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
RAYS		
Gymnura micrura	Pacific Butterfly Ray	NT
Pseudobatos productus	Shovelnose Guitarfish	LC

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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