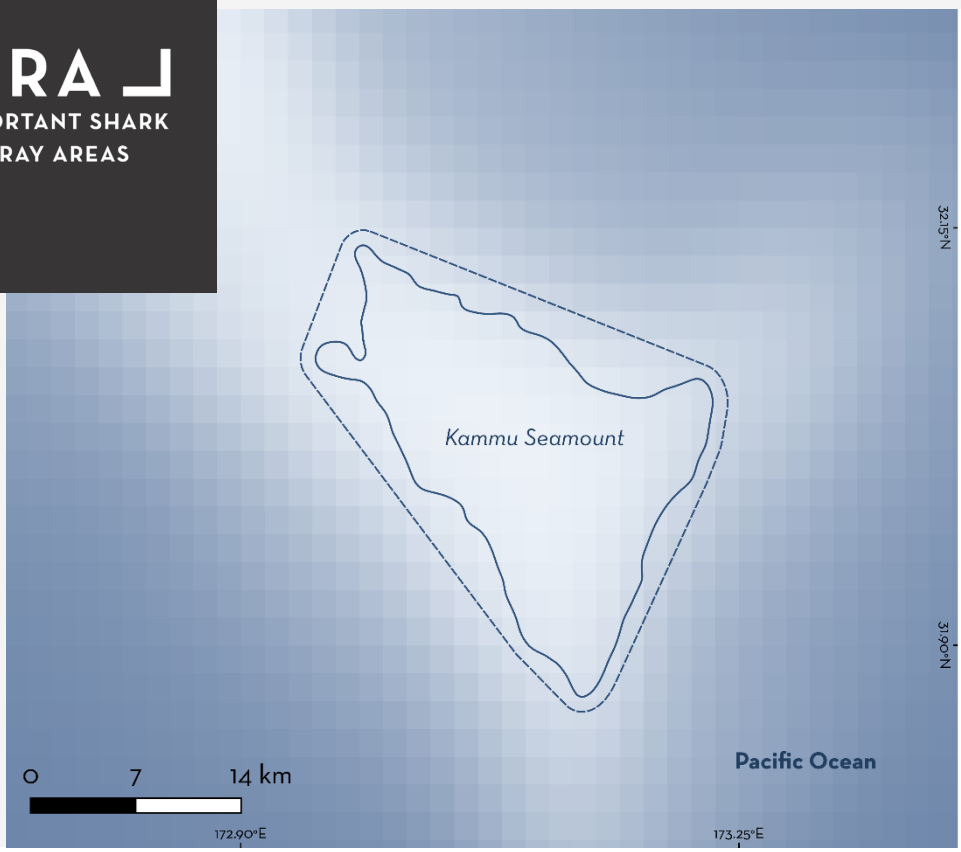
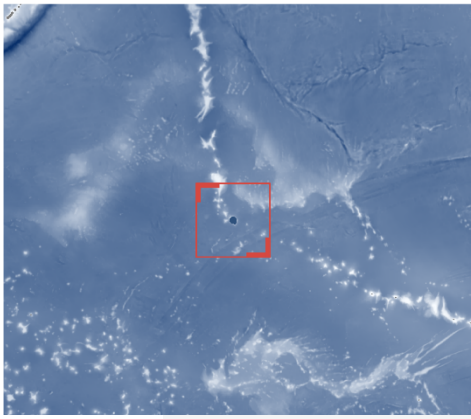
ISRA
IMPORTANT SHARK AND RAY AREAS





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

KAMMU SEAMOUNT ISRA

North American Pacific Region

ABNJ

320–645 metres

335.1 km²

SUMMARY

Kammu Seamount is located in Areas Beyond National Jurisdiction (ABNJ) in the North Pacific. This ancient underwater volcano sits at the southern end of the Emperor Seamount Chain where it rises about 4,600–4,700 m from the abyssal plain. The depth at the top of the seamount is at ~340–375 m below the surface. Kammu Seamount is comprised of two flat crests which are characterised by deepwater coral reefs. The area is influenced by the southern boundary of the Subarctic Frontal Zone with an eastward water transport direction in the Kuroshio Extension Current. This area overlaps with two Ecologically or Biologically Significant Marine Areas. Within this area there are: **undefined aggregations** (e.g., Owston's Chimaera *Chimaera owstoni*).

CRITERIA

Sub-criterion C5 – Undefined Aggregations

DESCRIPTION OF HABITAT

Kammu Seamount (also known as Kammu Guyot) is located in Areas Beyond National Jurisdiction (ABNJ) in the North Pacific. This ancient underwater volcano is a large seamount with a flat top on the Emperor Seamount Chain. It is situated at the southern end of the seamount chain and rises about 4,600–4,700 m from the abyssal plain (Calgue et al. 1980). The depth at the top of the seamount is at ~340–375 m below the surface (Calgue et al. 1980). Kammu Seamount is comprised of two flat crests, elongated northwest-southeast (Calgue et al. 1980). Seamounts/guyots of the southern Emperor Seamount Chain are characterised by deepwater coral reefs (Dautova 2025).

The area is influenced by the southern boundary of the Subarctic Frontal Zone with an eastward water transport direction in the Kuroshio Extension Current (Zuenko & Kurnosova 2025). The Subarctic Frontal Zone separates cold, fresher, Subarctic water to the north from warmer, more saline, subtropical water to the south (Yuan & Talley 1996). Seamounts on the Emperor Seamount Chain have heightened biological productivity relative to surrounding oceanic zones (Zuenko & Kurnosova 2025).

This area overlaps with the Emperor Seamount Chain and Northern Hawaiian Ridge Ecologically or Biologically Significant Marine Area (EBSA) and the North Pacific Transition Zone EBSA (CBD 2026a, 2026b).

This Important Shark and Ray Area is benthic, pelagic, and subsurface and is delineated from 320–645 m based on the depth range of Qualifying Species in the area.

ISRA CRITERIA

SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Kammu Seamount is an important area for undefined aggregations of one shark and one chimaera species.

Between 1979–2023, fishing surveys (n = 1,789) were conducted across the Emperor Seamount Chain with 14.1% occurring inside this area (n = 253; Volvenko 2014, 2015; IV Volvenko & AM Orlov unpubl. data 2025). Surveys were conducted every year except for the periods 1989–1992, 1994–2005, and 2007–2008 (surveys were conducted in different months across years). Fishing gear consisted of midwater trawls and benthic trawls at depths between 0–1,200 m and 160–1,340 m, respectively. Trawl parameters were variable with haul time ranging <1–12 hours (mean = 1 hour); haul speed ranging 1.5–6.5 knots (mean = 3 knots); and horizontal trawl opening ranging 11–100 m (mean = 28 m). In addition to these trawl surveys, between 2014–2018, catch data from scientific observers on longliners were recorded (215–1,840 m depth; each line was 900 m long with 640 hooks, with 1–12 lines deployed and retrieved per day; IV Volvenko & AM Orlov unpubl. data 2025). Catch-per-unit-effort (CPUE) was estimated as the number of individuals per area fished during the haul (multiplying the haul time by the haul speed and the horizontal opening of the trawl) and standardised as individuals/km^2. For longline sets, CPUE was estimated as the number of individuals caught per 1,000 hooks per 1 h (ind./1,000 hh).

Deepwater sharks, skates, and chimaeras are known to aggregate with temporal changes related to sex and life-stage segregations (e.g., Yano & Tanaka 1988; Swain & Benoît 2006; Coelho & Erzini 2010; Frisk 2010; Hoff 2010; Finucci et al. 2018). Species can aggregate in high density areas resulting in large catches in specific areas within the broader seascape (e.g., Bizzarro et al. 2014). Elevated CPUE relative to surrounding areas can be used as an indicator of aggregations of deepwater species (Orlov & Volvenko 2022). Specifically for lanternsharks and chimaeras, high densities of individuals

have been shown to be indicative of aggregations (Finucci et al. 2018). Through social association analyses, species of lanternsharks and chimaeras have been shown to have strong associations between individuals, often between the same life-stage (e.g., juveniles, adults) and sex (Finucci et al. 2018).

Across the broader Emperor Seamount Chain, 69,174 Smooth Lanternsharks were recorded in 800 hauls/sets during these surveys, of which 61 hauls/sets (7.6%) were conducted inside this area. Of these records, 67,552 (97.6%) originated from contemporary years (all years between 2010–2019) and 8,946 individuals (13.2%) were recorded inside this area. The highest CPUE (average = 345.1 individuals/km^2; max = 4,452.6 individuals/km^2) was recorded at Kammu Seamount, compared to all the seamount chain (average CPUE outside the area = 25.4 individuals/km^2; max = 2,026.4 individuals/km^2). The presence of aggregations was confirmed when >10 Smooth Lanternsharks were recorded in a single haul/set. Aggregations were recorded in 33 instances (54.1% of the surveys conducted inside this area) with an average of 223 individuals recorded per haul/set and a maximum of 3,456 individuals. These aggregations were recorded at depths of 323–645 m. The presence of Smooth Lanternshark aggregations may be related to feeding on schools of epipelagic fish migrating from Asia to this area (Volvenko et al. 2025).

Across the broader Emperor Seamount Chain, 333 Owston's Chimaeras were recorded in 143 hauls/sets during these surveys of which nine hauls/sets (6.3%) were conducted inside this area. Of these records, 321 (96.4%) originated from contemporary years (all years between 2011–2018) and 35 individuals (11.0%) were recorded inside this area. The second highest CPUE (average = 1.4 individuals/km^2; max = 30.1 individuals/km^2) was recorded at Kammu Seamount compared to all the seamount chain (average CPUE outside the area = 0.4 individuals/km^2; max = 1.2 individuals/km^2) after Koko Guyot. The presence of aggregations was confirmed when >5 Owston's Chimaeras were recorded in a single haul/set. Aggregations were recorded in five of the six surveys (83.3%) conducted inside this area in contemporary years with an average of six individuals recorded per set and a maximum of ten individuals. These aggregations were recorded at depths of 457–645 m.

Additional information is required to understand the nature and function of these aggregations.

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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												
Etmopterus pusillus	Smooth Lanternshark	LC	0–1,998							X		
CHIMAERAS												
Chimaera owstoni	Owston's Chimaera	DD	457–900							X		

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Etmopterus lailae	Laila's Lanternshark	DD

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.

REFERENCES

Bizzarro JJ, Broms KM, Logsdon MG, Ebert DA, Yoklavich MM, Kuhnz LA, Summers AP. 2014. Spatial segregation in Eastern North Pacific skate assemblages. *PLoS ONE* 9: e109907. https://doi.org/10.1371/journal.pone.0109907

Calgue DA, Dalrymple GB, Greene HG, Wald D, Kono M, Kroenke LW. 1980. Bathymetry of the Emperor Seamounts. In: Shambach J, Jackson ED, Koizumi I, Avdeiko G, Butt A, Clague D, Dalrymple GB, Greene HG, Karpoff AM, Kirkpatrick RJ, et al, eds. Initial reports of the Deep Sea Drilling Project covering Leg 55 of the cruises of the drilling vessel Glomar Challenger, Honolulu, Hawaii to Yokohama, Japan; July-September 1977. College Station: Texas A & M University, Ocean Drilling Program, 845–849.

Coelho R, Erzini K. 2010. Depth distribution of the velvet belly, *Etmopterus spinax*, in relation to growth and reproductive cycle: The case study of a deep-water lantern shark with a wide-ranging critical habitat. *Marine Biology Research* 6: 381–389. https://doi.org/10.1080/17451000802644706

Convention on Biological Diversity (CBD). 2026a. Ecologically or Biologically Significant Areas. Emperor Seamount Chain and Northern Hawaiian Ridge. Available at: https://chm.cbd.int/en/database/record?documentID=204131 Accessed March 2026.

Convention on Biological Diversity (CBD). 2026b. Ecologically or Biologically Significant Areas. North Pacific Transition Zone. Available at: https://chm.cbd.int/en/database/record?documentID=204130 Accessed March 2026.

Dautova TN. 2025. Introduction to the Emperor Seamount Chain studies. *Deep-Sea Research Part II* 222: 105486. https://doi.org/10.1016/j.dsr2.2025.105486

Finucci B, Dunn MR, Jones EG. 2018. Aggregations and associations in deep-sea chondrichthyans. *ICES Journal of Marine Science* 75: 1613–1626. https://doi.org/10.1093/icesjms/fsy034

Frisk MG. 2010. Life history strategies of batoids. In: Carrier JC, Musick JA, Heithaus MR, eds. *The biology of sharks and their relatives II.* Boca Raton: CRC Press, 283–316.

Hoff GR. 2010. Identification of skate nursery habitat in the eastern Bering Sea. *Marine Ecology Progress Series* 403: 243–254. https://doi.org/10.3354/meps08424

Orlov AM, Volvenko IV. 2022. Long-term changes in the distribution and abundance of nine deep-water skates (Arhynchobatidae: Rajiformes: Chondrichthyes) in the Northwestern Pacific. *Animals* 12: 3485. https://doi.org/10.3390/ani12243485

Swain DP, Benoît HP. 2006. Change in habitat associations and geographic distribution of thorny skate (*Amblyraja radiata*) in the southern Gulf of St Lawrence: density-dependent habitat selection or response to environmental change? *Fisheries Oceanography* 15(2): 166–182. https://doi.org/10.1111/j.1365-2419.2006.00357.x

Volvenko IV. 2014. The new large database of the Russian bottom trawl surveys in the Far Eastern Seas and the North Pacific Ocean in 1977–2010. *International Journal of Environmental Monitoring and Analysis* 2(6): 302–312. https://doi.org/10.11648/j.ijema.20140206.12

Volvenko IV. 2015. The comparative statuses of the Far Eastern seas and the northwestern Pacific Ocean based on the range of integral characteristics of pelagic and bottom trawl macrofauna. *Journal of Asia-Pacific Biodiversity* 8: 31–37. https://doi.org/10.1016/j.japb.2015.01.006

Volvenko IV, Vinnikov AV, Terentiev DA, Orlov AM. 2025. Elasmobranch bycatch in Russian fisheries in the Pacific Ocean. *ICES Journal of Marine Science* 82: fsaf157. https://doi.org/10.1093/icesjms/fsaf157

Yano K, Tanaka S. 1988. Size at maturity, reproduction cycle, fecundity, and depth segregation of the deep sea squaloid sharks *Centroscymnus owstoni* and *Centroscymnus coelolepis* in Suruga Bay, Japan. *Nippon Suisan Gakkaishi* 54: 167–174.

Yuan X, Talley LD. 1996. The subarctic frontal zone in the North Pacific: Characteristics of frontal structure from climatological data and synoptic surveys. *Journal of Geophysical Research* 101(C7): 16491–16508. https://doi.org/10.1029/96JC01249

Zuenko Y, Kurnosova A. 2025. Nutrient uptake over Koko Seamount, North Pacific. *Journal of Marine Systems* 251: 104121. https://doi.org/10.1016/j.jmarsys.2025.104121