



SEAMOUNTS: REST STOPS AND FILLING STATIONS FOR TUNA AND SWORDFISH

At a workshop held in New Caledonia in March of this year, scientists examined the pivotal role of seamounts in relation to commercially important pelagic species such as albacore (*Thunnus alalunga*), bluefin tuna (*Thunnus orientalis*), bigeye tuna (*Thunnus obesus*), yellowfin tuna (*Thunnus albacares*) and swordfish (*Xiphias gladius*) and concluded that there is strong evidence of a link between these species and seamounts.

Akin to oceanic filling stations or rest stops, the seamounts act as a foraging habitat for pelagic fish which are attracted by the high concentrations of zooplankton and micronekton found around them.

Zooplankton is trapped around seamounts primarily because layers of these animals (known as the deep-scattering layer or DSL) migrate towards the sea surface at night and are then advected - transferred by water movement - over the summit of the feature. When these animals attempt to migrate into deeper water at dawn, they are trapped by the physical presence of the seamount.

Other factors contribute to the concentration of these organisms in the vicinity of seamounts but most are, as yet, poorly understood. In some cases seamounts have resident populations of zooplankton or micronekton.

Evidence from acoustic studies, the analysis of zooplankton and zooplankton carcass distribution and of fish gut contents, has pointed to the fish intercepting the migrating layers of DSL. In some cases, several steps in the food chain (trophic levels) have been completed before the energy from the zooplankton is transferred to larger pelagic species, pointing to a complex interaction between many levels of the ecosystem.

These pelagic fish primarily use seamounts as feeding grounds, but may also use the areas for spawning and nursery grounds and possibly as navigational markers.

Seamount ecosystems can be characterized by high proportions of species new to science (54% of species collected during a seamount research cruise in 2002 were new), some of which may be endemic. They also support vulnerable benthic communities, including deep-water corals and sponges. Benthic seamount fauna is characterized by a high percentage of species unknown to science.

Because of their associated high economic value, seamounts are targeted by commercial and recreational fishers. Gears utilized include bottom trawling, deep-water trolling, longline, and purse seines.

Stone et al. (2003), reported that un-fished seamounts have twice the biomass of fished seamounts; that most seamounts were located in international waters (high seas); and that “there is no international law pertaining specifically to the conservation of seamounts.”

With the threats that seamounts face from destructive fishing practices and in light of this strong evidence linking seamounts to valuable pelagic fisheries, it appears highly prudent that international bodies act now to protect these vulnerable resources.

Examples of pelagic fisheries associated with seamounts include the following:

Target species	Seamount	Fishery	Reference
Swordfish	Eastern Australian Seamounts (Australia)	Longline fishery	Campbell and Hobday, 2003
Bigeye tuna	Musicians and Navigator seamounts (Hawaii)	Longline fishermen	Allain et al, 2006
Albacore and bluefin tuna	Cross seamount (Hawaii)	Commercial fisheries	Beverly et al., 2004; Itano and Holland, 2000
Albacore and bigeye tuna	Emperor Seamount chain (Hawaii)	Many fisheries including longline	Yasui, 1986
Tuna	Capricorn Seamount (Tonga)	Longline fisheries	Allain et al, 2006
Tuna aggregations	“Coco de mer” seamount (Indian Ocean)	Purse seine fishery	Arrizabalaga et al, 2001
Albacore tuna	Cordell Bank seamount (USA, Pacific)		Allain et al, 2006
Tuna	Tasmanian Seamounts (Australia)	Recreational and commercial fisheries	National Ocean Service, 2001
Albacore tuna	Bowie Seamount (Canada, Pacific)	Longline fisheries	Commonwealth of Australia 2002
Tuna aggregations	Seamounts worldwide, throughout tropical oceanic waters	Commercial fisheries	WWF, 2003
			Fonteneau, 1991

The workshop was held in Noumea, New Caledonia, in March 2006. The full report is available from www.savethehighseas.org.

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Parin NV, Mironov AN, Nesis KN (1997) Biology of the Nazca and Sala Y Gómez submarine ridges, an outpost of the Indo-West Pacific Fauna in the eastern Pacific Ocean: Composition, and distribution of the fauna, its communities and history. *Advances in Marine Biology* 32: 145-242.

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WWF, 2003. Management Direction for the Bowie Seamount Mpa: Links Between Conservation, Research, and Fishing. 76 pp.

Yasui, M., 1986. Albacore, *Thunnus alalunga*, pole-and-line fishery around the Emperor Seamounts. from *Environment and Resources of Seamounts in the North Pacific*. R. Uchida, S. Hayashi, and G. Boehlert [eds]. NOAA Technical Report NMFS 43. September 1986. pp 37 – 40. highlights the value of seamounts as foraging habitat for commercially important pelagic species, such as albacore (*Thunnus alalunga*), bluefin tuna (*Thunnus orientalis*), bigeye tuna (*Thunnus obesus*), yellowfin tuna (*Thunnus albacares*), and swordfish (*Xiphias gladius*) (Allain et al. 2006).