

Important Areas (IAs) were identified for sponges (Hexactinellid reefs and cloud sponge communities) and corals in 2006 by interviewing experts and considering relevant literature. This was done during the process of establishing Ecologically and Biologically Significant Areas (EBSAs) in PNCIMA. As structure-forming species, sponges and corals provide highly complex habitat and are likely to support diverse species communities. Because they are long-lived and slow-growing, they are highly vulnerable to human activities.<sup>1</sup>

**Sponges**

Sponges are sessile (non-moving) animals that form unique three-dimensional living habitat structures. They are found from the intertidal zone to the deep sea abyss, including seamounts. There are three living classes of sponges: Calcarea, Hexactinellida and Desmospongiae. Representatives of each class are found in PNCIMA.

Fishery management closures have been implemented in PNCIMA to protect known sponge reefs from bottom trawl fishing in an area currently covering 1830 km<sup>2</sup>. The locations of all known sponge reef representatives were considered to be IAs; however, there are currently no sponge species listed under *Species at Risk Act* (SARA) legislation.<sup>2</sup>

**Hexactinellid (Glass) Sponge Reefs**

Hexactinellid sponges are commonly referred to as glass sponges because about 90 percent of their dry weight is glass or silica.<sup>3,4</sup> The five known PNCIMA glass sponge reef complexes are structures globally unique to BC. They occur in Hecate Strait and Queen Charlotte Sound. While only recently discovered in 1987, these sponge reefs are believed to be hundreds, if not thousands, of years old.<sup>1</sup>

The existence and formation of glass sponge reefs requires the combination of a unique geological setting along with the occurrence of particular Hexactinellida sponge species. These species are typically found in deep water, and they prefer habitats with high dissolved silica levels, low light levels, cold temperatures and substrates with little to no sediment accumulation. The reefs are known to attract a multitude of other invertebrate animals such as tunicates, sea stars, brittle stars, gastropods, polychaetes, amphipods and arthropods (shrimp, crabs and barnacles). Various fish species have also been noted to use the three-dimensional rigid structures as refugia<sup>5</sup> and to lay their eggs.<sup>2</sup>

Survey effort is not consistent across all planning units or areas. Areas with no data may not have been surveyed; these data gaps are not necessarily indicative of an absence of sponge reefs.<sup>6</sup>

**Cloud Sponges**

Cloud sponges are a type of glass sponge. Upwelling of cold seawater appears to be an important factor for the formation of boot and cloud sponge communities.<sup>1</sup>

While no cloud sponge communities have been physically identified within PNCIMA, possible IAs were identified in areas within PNCIMA. These areas possess similar conditions to areas in Howe Sound and the Georgia Basin where cloud sponge communities were recently discovered. Cloud

sponge IAs are considered to be of moderate value because of their possible regional and national uniqueness, and the aggregation of unique communities associated with the complexity of their structures. The possible cloud sponge IAs mapped are actually larger than those identified by the subject field experts in order to display them in the small scale map.<sup>1</sup>

**Corals and sponges are highly vulnerable to human activities**

**Corals**

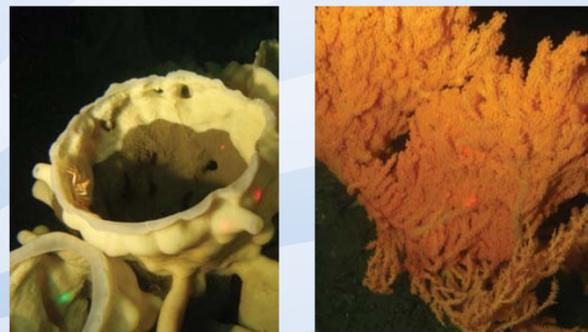
Coldwater corals are a diverse group of sessile, benthic (bottom-dwelling) animals that have adapted to the cold, dark, extreme marine environments found within PNCIMA.

The identification of aggregations of corals in BC to date is based on the analysis of groundfish trawl by-catch data. These data identify 12 areas that contain 90 percent of the coral and sponge trawl by-catch by weight. Nine of these areas fall within PNCIMA; all of them were identified as IAs.<sup>1</sup> At the time of writing, there are no coral species listed under SARA, although corals are listed by other countries and the Convention on International Trade in Endangered Species of Flora and Fauna.<sup>7</sup>

Cold-water corals in PNCIMA live on substrates between the intertidal zone and the deep sea. Cold-water coral structures range from small, solitary individuals to large colonies and reefs.

Corals are considered to be important components of hard-bottom environments because they make them more structurally complex and provide topographic relief<sup>8</sup>, which attracts fish and invertebrates. Corals may be referred to as foundation species because they play an important role in modifying habitat, altering water movement patterns and influencing the supply of food and larvae.<sup>2</sup>

1 Clarke, C.L. and Jamieson, G.S. 2006. Identification of ecologically and biologically significant areas in the Pacific North Coast Integrated Management Area: Phase I – identification of important areas. Can. Tech. Rep. Fish. Aquat. Sci. 2678: vi + 89 p.  
 2 Lucas, B.G., Verrin, S. and Brown, R. (Editors). 2007. Ecosystem overview: Pacific North Coast Integrated Management Area (PNCIMA). Can. Tech. Rep. Fish. Aquat. Sci. 2667: xiii + 104p. Appendix F.  
 3 Dayton, P.K., Robilliard, G.A., Paine, R.T. and Dayton, L.B. 1974. Biological accommodation in the benthic community at McMurdo Sound Antarctica. Ecol. Monographs 44: 105-128.  
 4 Austin, W.C. 1984. Underwater birdwatching. In: Proceedings of a multidisciplinary symposium on Saanich Inlet. Edited by Juniper, S.K. and Brinkurst, R.O. Canadian Tech. Rept. of Hydrogr. and Ocean Sci. No.38, 104pp.  
 5 Refugia are places where a species or community may continue to exist, even if environmental change is occurring in other places where it occurs.  
 6 British Columbia Marine Conservation Analysis Project Team. 2011. Marine atlas of Pacific Canada: a product of the British Columbia Marine Conservation Analysis. Available from www.bcmca.ca (Accessed March 2011).  
 7 CITES. 2011. CITES species database. http://www.cites.org/eng/resources/species.html (Accessed February 2011).  
 8 Relief is the difference in elevation between the high and low points of a surface; changes in terrain; or elevations or depressions in the land.



Left: Sponge. Right: Coral. Photos: DFO Science

