

Former HMCS Annapolis as reef habitat: Regaining lost ground

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What's new in the world of reef habitat?

The newest artificial reef in British Columbia is the 370-metre long Annapolis, formerly the HMCS Annapolis, a Canadian naval destroyer escort. The ship was sunk in April 2015 at Halkett Bay on Gambier Island in Howe Sound. Over the past 27 years the Artificial Reef Society of B.C. (ARSBC) has created eight artificial reefs along the coast of B.C. and all provide habitat opportunities for underwater life in areas assessed as having low marine life potential primarily due to flat and featureless topography of the seafloor. The Halkett Bay site was also previously impacted by pollution and lacking biodiversity as a result. These artificial reefs provide unique recreational SCUBA diving opportunities.

Concerns over any risks posed to the marine environment were addressed to the satisfaction of Environment Canada, who, after thorough inspections, issued a Disposal at Sea permit stating that all waste from the ship had been removed, including all petroleum-based products. In addition, a park use permit was issued by BC Parks, which allows for the long term use of Halkett Bay as the home for the Annapolis.



The Annapolis in Halkett Bay prior to sinking. (Photo: Doug Pemberton)

Why are artificial reefs important?

For several decades, Halkett Bay on Gambier Island was used extensively for log boom storage. The wood debris from these log booms eventually smothered the bottom, creating a detrimental environment and severely reducing the potential for marine life growth. Howe Sound has also suffered a severe depletion of rockfish and lingcod over the past few decades. Some species of rockfish have disappeared and lingcod

numbers have been reduced by about 90 percent.¹ Rockfish and lingcod naturally favour irregular rocky reef environments. The Annapolis provides similar new reef habitat with complex structure and vertical profile for these fishes. The sport diving opportunities offered by the Annapolis artificial reef also provide an economic benefit to dive charter businesses, local restaurants and hotels.

Is there a particular importance or connection to First Nations?

Consultation was very important in the process of getting approvals to sink this ship in Howe Sound and particularly in Halkett Bay as the Squamish Nation has an historical presence in the area. They supported the

project from the outset and the Artificial Reef Society continues to work closely with them through an ongoing study of the increasing biodiversity found at the reef (Project Annapolis Biodiversity Index Study).

What's the current state of habitat in and around the reef?

In the 1970s research on environmental quality undertaken by an Interdepartmental Task Force on National Marine Parks showed that bottom-dwelling marine life potential had been severely impacted by wood debris from the nearly constant presence of log booms moored in Halkett Bay and many other locations in Howe Sound.² More recently, this damage was confirmed by a biological study to the depth limit of rec-

reational diving (130 feet). The study found evidence of little to no marine life, which was documented in detail as part of the mandatory permit application process for the sinking of the Annapolis.³ Regular use of Halkett Bay for log boom storage has ceased, though booms in transit are occasionally stored in the bay temporarily during periods of bad weather.

What is being done?

Protection and study of sensitive and vulnerable habitats is one way to conserve biodiversity. Howe Sound is the only place in the world where glass sponge reefs can be safely studied by SCUBA divers, because some have been discovered here at accessible depths. A new extension of Halkett Bay Marine Park protects and preserves one of these reefs and allows citizen science divers to document observations of the glass sponge reef and its inhabitants over time. Such observations may help us better understand the impacts of climate change on these unique habitats.

In order to better understand the progression and abundance of species that populate the new Annapolis reef, the ARSBC has instituted the Annapolis Biodiversity Index Study (Project A.B.I.S.), a citizen scientist based study. The Project A.B.I.S. team includes members of BC Parks, Fisheries and Oceans Canada, the Vancouver Aquarium Marine Science Centre,



Spot prawn using the new artificial reef as habitat.

Squamish Nation, the Marine Life Sanctuaries Society and the ARSBC. Underwater photographers, videographers and knowledgeable divers have been encouraged to contribute observations since the ship's sinking on April 4, 2015. To date nearly 50 species of marine flora and fauna have been documented using

the Annapolis reef including two species of rockfish and 12 species unique to this new reef (Figure 1). Comparison of species counts at two natural sites with different habitats, Halkett and Pinnacle, illustrates natural differences among habitat types (Figure 1). Sponges are the only group that had not been seen on the Annapolis, as of March 2016. As time progresses, counts at the Annapolis site would not be expected to match either of the others, but should be more similar to the Halkett site, just across the Bay from the sunken ship. The biodiversity information is being shared between all involved parties and is made available on

the Vancouver Aquarium website as well as the ARSBC website.

Encouraged by the volunteer response to this study and by the biodiversity results that were recorded in the first year, the ARSBC applied for a Parks Enhancement Funding grant in May 2016. The application was accepted and the funds will be used to help offset the cost of getting a dedicated core of citizen scientist divers out on the ship on a regular basis to continue documenting observations.

DIVERSITY OF SPECIES OBSERVED AT THREE UNDERWATER HABITATS IN HOWE SOUND

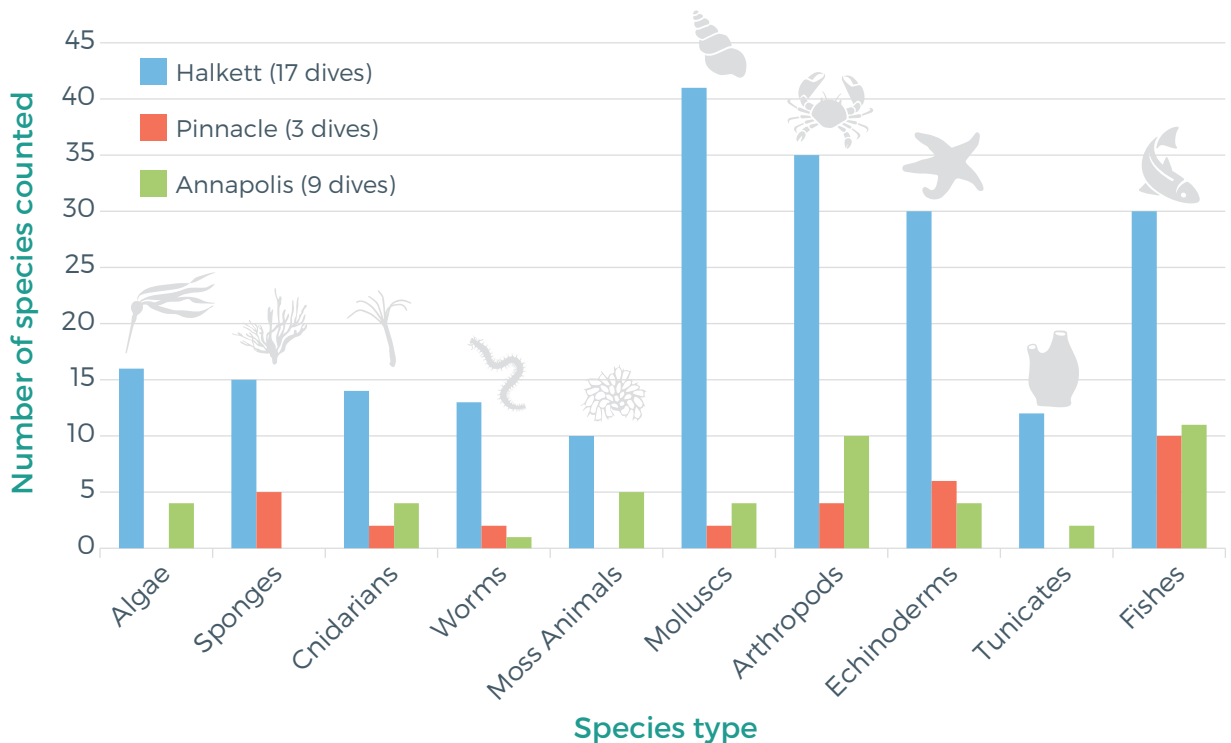


Figure 1. Number of species in different categories observed at three underwater sites in the area. Halkett (blue bars) refers to East Halkett Bay, a natural underwater wall habitat. Pinnacle (red bars) refers to the sponge bioherm east of Halkett Bay, and within the Halkett Bay Marine Park expansion. Annapolis (green bars) refers to the new Annapolis artificial reef. The three sites represent different types of habitat so the number of species in different categories is not expected to match among sites. (Analysis done March 2016)

What can you do?



Individual and Organization Actions:

- Learn about the monitoring project through the ARSBC website: artificialreefsocietybc.ca
- If you are a diver, please contribute your observations. Pictures, videos and information can be uploaded to the Vancouver Aquarium here: vanaqua.org/act/research/annapolis



Government Actions and Policy:

- Support citizen science efforts.
- Monitor and assess the effectiveness of artificial reef habitat.

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Resources

<http://www.aquablog.ca/2016/01/all-aboard-the-annapolis/>

Footnotes

¹ Martell, S.J.D. and S. S. Wallace. 1998. Estimating historical lingcod abundance in the Strait of Georgia. Pages 45–47 in D. Pauly and D. Preikshot, eds. Back to the future: reconstructing the Strait of Georgia ecosystem. Fisheries Centre, Univ. British Columbia, Vancouver. 211 p.

² McDaniel, N.G. 1973. A Survey of the Benthic Macroinvertebrate Fauna and Solid Pollutants in Howe Sound. Fisheries Research Board of Canada, Technical Report No. 385, 64pp. Retrieved from <http://www.dfo-mpo.gc.ca/Library/20924.pdf> 26 July 2016.

³ Artificial Reef Society of BC (ARSBC). 2009. HMCS Annapolis – Benthic Survey Report for Halkett Bay Site, Prepared for BC Ministry of Environment & Federal Department of Fisheries & Oceans, 19pp.