

Artificial Reef off Sydney: Discussion document from the Gordons Bay Scuba diving Club Inc (GBSDC) July 2013

Executive Summary

Artificial reefs that are created using ex naval vessels:

Core Values

Environmental Values

- Function as new habitats for a multitude of vertebrate and invertebrate species
- Create effective marine habitats on what is otherwise a soft-bottomed featureless environment.
- Alter the connectivity patterns between natural reefs in a positive way
- Provide corridors so smaller fish can safely move from one reef to another
- Conserve pre-existing habitats as well as form new habitats of complex ecological systems
- Are positive additions to ocean environments

Economic Values

- On average scuttled reef ships world-wide generate annually \$3.4M per ship.
- Ex HMAS Brisbane generates \$A4.3M per annum, per annum running costs of \$A7.7K for an initial investment of \$A4.75M.
- Ex HMAS Swan Geraldton WA ?
- Ex HMAS Perth ? WA ?
- Ex HMAS Hobart Adelaide SA ?
- Ex HMAS Canberra, Mornington Peninsula VIC ?
- Ex HMAS Adelaide Avoca Beach NSW \$2.4M
- 5800 divers \$110 per diver \$638000
- Park fees 116000
- Accommodation 870000
- Food & Drink 290000
- Fuel 290000
- Incidentals 116000
- Total 2,400,000

Education Values

- Suffer a sea change in something rich and strange.
Ex HMAS Adelaide shortly after sinking



One year on



Photos Rob Westerdyk CCARP

Research Values

- The Sydney Institute of Marine Science (SIMS) will undertake research projects on a scuttled ship.

Recreational Values

- Great dive site for Scuba Divers
- Potential for underwater camera for 24 hour surveillance for non-divers (ex HMNZS Wellington)

Rationale

Defence Disposals Agency (DDA) which is responsible for Defence Material disposal says that given the level of complexity and risks involved, in particular the detailed planning required, liability, safety and environmental considerations in creating artificial reefs from ex-navy ships it is normal practice for such requests to be supported by a business case submitted by State Governments. State Governments are normally expected to fund and manage the establishment of artificial reefs and dive wrecks. A list of references for this document available on request to secretary@gordonsbayscubadivingclub.com

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**The Gordons Bay Scuba Diving Club Inc. www.gordonsbayscubadivingclub.com.au
(GBSDC).**

The (GBSDC) is an Australian non-profit incorporated association registered in NSW and operating from Bronte NSW. The Club was founded in 1990 and has, since that time, created and maintained, Lands Office permissive occupancy #1986/75 the underwater nature trail in Gordon's Bay Clovelly NSW Australia. The Club was awarded a Sydney Morning Herald Community Service award in 1993. The Professional Association of Diving Instructors (PADI) awarded the Club *the PADI Service to the Diving Community Award in 1996*. The Club has also received Commonwealth Heritage Grants, with Randwick City Council, totalling \$50000.00 to maintain the underwater nature trail, to support marine science research projects on biological controls of algae on coastal bathing platforms and coastal biodiversity signs on the Randwick City Council Coastline.

At the March 2005 monthly meeting of the Club, members moved that the Club become involved in researching, measuring, and finding out the community demand for a project to obtain, a decommissioned navy ship and with appropriate preparation and consultation with various stakeholders on a suitable location to scuttle the ship as a recreational dive location, marine research and artificial reef location. We have written and contacted many stake holders in the last five years but put all of our plans on hold preferring to support the Central Coast Artificial Reef Project (CCARP) in the sinking of the ex HMAS *Adelaide* which struck surprising ill informed opposition but now that it has been successfully sunk, and is contributing significantly to the local economy we wish to reactivate our project. However no commitment has been received from either the NSW or Federal Government, The Club has registered its interest with the Defence Disposals Agency and sees this document as a preliminary discussion plan for both governments consideration. The proposal is predicated on a fully funded government project.

Background

Options for managing obsolete and decommissioned military and commercial vessels include reuse of the vessel or parts of the vessel, recycling or scrapping, creating artificial reefs, and disposal on land or at sea (US EPA, 2006). The Australian Government has, in the past, a policy of ceding to the States its decommissioned warships, with the States being invited to lodge expressions of interest for the acquisition of the decommissioned vessels. Defence Disposals Agency (DDA) which is responsible for Defence Material disposal says that given the level of complexity and risks involved, in particular the detailed planning required, liability, safety and environmental considerations in creating artificial reefs from ex navy ships it is normal practice for such requests to be supported by a business case submitted by State Governments. State Governments are normally expected to fund and manage the establishment of artificial reefs and dive wrecks. Six former warships have already been scuttled to create artificial reefs and recreational dive sites in Australia:

Ex-HMAS SWAN off Dunsborough, Western Australia (December 1997)

Ex-HMAS PERTH off Albany, Western Australia (November 2001)

Ex-HMAS HOBART in Yankalilla Bay, Fleurieu Peninsula, South Australia (November 2002)

Ex-HMAS BRISBANE off Mooloolaba, Queensland (July 2005)

Ex-HMAS CANBERRA off Ocean Grove, Victoria (October 2009).

Ex.HMAS ADELAIDE off Avoca Terrigal Beaches NSW (April 2011)

Worldwide: Ships sunk for Artificial Reefs and Recreational Diving

(http://en.wikipedia.org/wiki/Sinking_ships_for_wreck_diving_sites)

2011	USS Arthur W. Radford (DD-968)	Cape May, New Jersey	United States
2011	USS Kittiwake	West Bay, Grand Cayman	Cayman Islands
2009	USNS General S. Hoyt Vandenberg (T-AGM-10) ^[1]	Key West, Florida	United States
2007	HMNZS Canterbury (F421)	Bay of Islands	New Zealand
2006	Xihwu 737 ^[2]	Boeing British Columbia	Canada
2005	HMNZS Wellington (F69)	Wellington	New Zealand
2004	HMS Scylla	Whitsand Bay, Cornwall	United Kingdom
2004	USS Oriskany ^[3]	Florida	United States
2003	CS Charles L. Brown ^[4]	Sint Eustatius	Leeward Islands
2003	HMCS Nipigon	Quebec	Canada
2002	MV <i>Dania</i> ^[5]	Mombasa	Kenya
2002	USS Spiegel Grove ^[6]	Florida	United States
2001	HMCS <i>Breton</i> ^[2]	Cape British Columbia	Canada
2000	HMCS <i>Yukon</i> ^[2]	San Diego, California	United States
2000	Stanegarth	Stoney Cove	United Kingdom
2000	HMNZS Waikato	Tutukaka	New Zealand

	(F55)			
1999	HMNZS (1970)	Tui	Tutukaka Heads	New Zealand
1995	HMCS Saskatchewan ^[2]		British Columbia	Canada
1996	HMCS Columbia ^[2]		British Columbia	Canada
1996	MV Keith Captain Tibbetts (formerly Russian-built Frigate 356)		Cayman Brac	Cayman Islands
1996	Inganess Bay ^[9]			British Virgin Islands
1995	HMCS Mackenzie ^[2]		British Columbia	Canada
1992	HMCS Chaudière ^[2]		British Columbia	Canada
1991–2001	"Wreck Alley" – The Marie L , The Pat and The Beata ^[10]			British Virgin Islands
1991	MV G.B. Church ^[2]		British Columbia	Canada
1990	Fontao		Durban	South Africa
1990	T-Barge		Durban	South Africa
1987–2000	Wreck Alley	San Diego, California		United States
1987	USCGC Bibb ^[11]		Florida	United States
1987	USCGC Duane ^[11]		Florida	United States
1980	Oro Verde ^[12]			Cayman Islands
1970	Glen Strathallen (sunk to produce a diver training facility)	Plymouth		United Kingdom

- [HMCS Annapolis](#). An Annapolis class destroyer decommissioned by the [Canadian Forces](#) in 1996. The ship was purchased by the [Artificial Reef Society of British](#)

[Columbia](#) in 2008, which plans to sink her in Port Graves (Long Bay) on Gambier Island in Howe Sound.^[13]

Preliminary Site Selection.

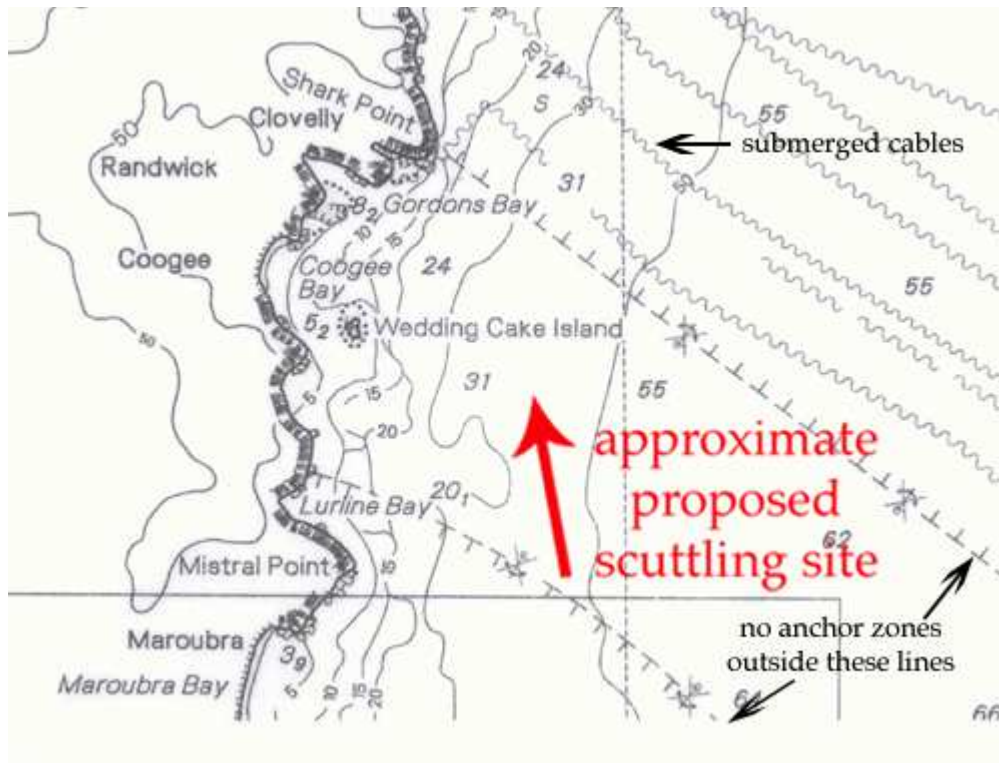
Coogee was seen as the perfect and natural location for an artificial reef as it is midpoint between Sydney Harbour and Botany Bay where most dive boat charter operators launch their dive boats. Further it is within easy distance of several popular dive destinations such as Magic Point, Wedding Cake Island and the highly regarded shore dive location at Shark Point Clovelly NSW.

A site selection study was undertaken to identify a suitable area with these characteristics:

- a bare sandy bottom without extreme conditions such as strong rips or currents.
- the ability to attract marine life to colonise the artificial reef
- appropriate depth to the seabed and underlying rock to ensure a scuttled vessel could penetrate into the sand and remain stable and upright
- meeting navigational safety requirements
- minimal impact on commercial fisheries
- within reasonable proximity to on-shore infrastructure for dive operators.
- Water depths in this area are between 30 and 34m.
- Be devoid of sensitive marine habitats and have minimal impact on the local coastline.
- Have the ability to attract fish and increase local biodiversity.
- Have geological characteristics suitable for the ship to settle with no impact on local reefs and other geological features.
- Be at an appropriate depth of water.
- Not impact on shipping lanes or navigational areas.
- Not be dangerous for scuba diving and have good visibility.
- Not impact on other legitimate uses that may operate in the area.
- Have no natural reef or seagrass beds.

Coogee was chosen as it reflects all of the above characteristics.

Location Plan



GBSDC preferred site: The GPS coordinates of the proposed site are approximately S 33d 56' 908' and E 151d 16' 755", depth 32.6meters.

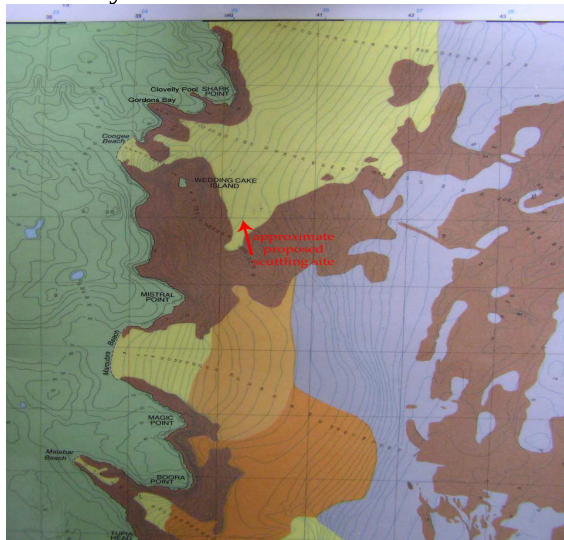
The site is in approximately 32m of water, has a sandy bottom and is clear of rocky reefs.






Commercial dive operator Yves Moulard, Scubaroo took Club members Peter Howard and George Evatt to the site from the Rose Bay wharf on Aug. 21 2006. They employed a 20m rope, which they attached to the anchor line to swim in a circle of diameter 40m around the site. Their observations and the following photographs, taken on their dive, confirm the suitability of the site.

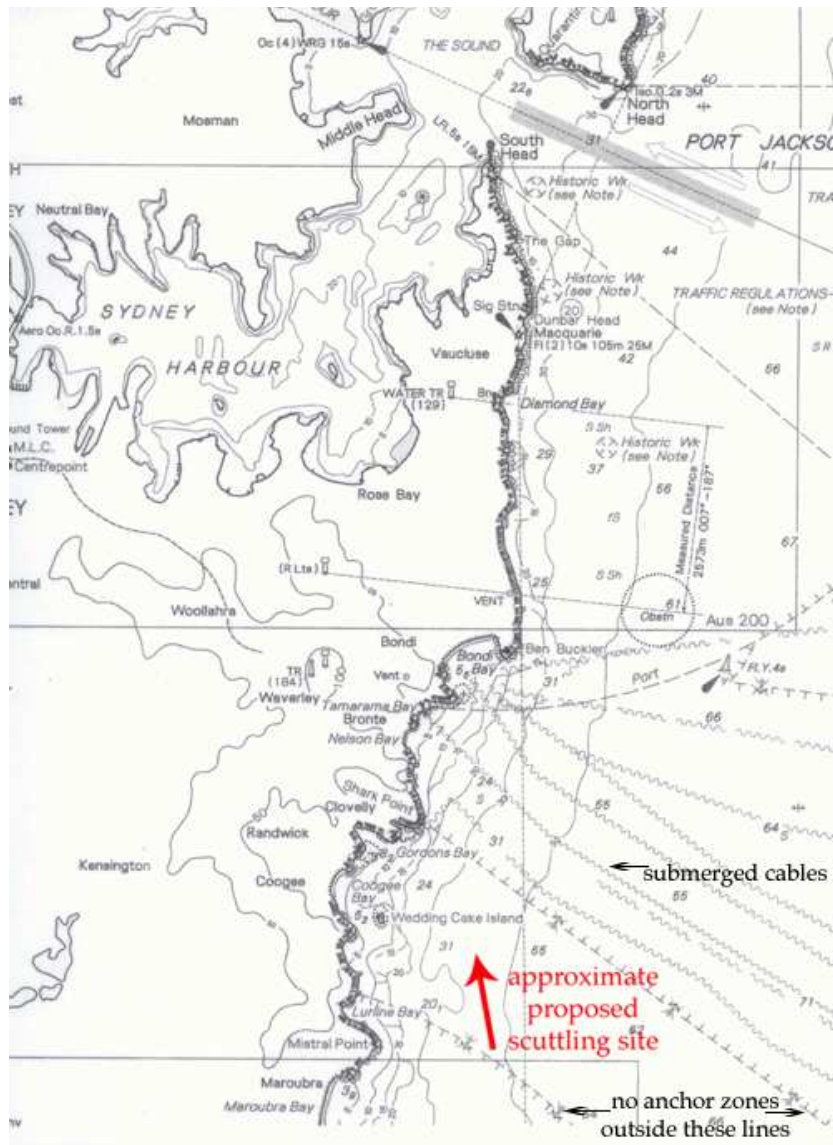




Bate Bay 82310-577



-  Medium to coarse grained, orange coloured sand with 40% shell
-  Fine grained, grey coloured sand with 5% to 20% mud and 30% to 40% shell
-  Fine grained fawn coloured sand with 30% shell
-  Fine to medium grained, golden coloured sand with 10%-60% shell.
-  Rocky Reef



Site Constraints

- | | | |
|----------------------|----------|--|
| 1) Depth | High | The 30 m - 35 m preferred depth range constrains site selection to the area selected. |
| 2) Exclusion Zones | | |
| Commercial Fishing | High | Potential conflict of interest with commercial fisherman, particularly trawlers. Earlier stakeholder consultation showed that stakeholders would like to cooperate with the project. |
| Recreational Fishing | Moderate | Recreational fishing from beaches, rock platforms and offshore is popular in the study area. Operation of an exclusion zone around the dive site could potentially conflict with offshore fishing. |

Recreational Diving,	Low	The additional dive site would complement existing nearby sites such as Shark Point, Magic Point, Wedding Cake Island and Gordons Bay. A spear fishing closure is a source of conflict with spear fishers
Snorkelling and Recreational Sailing and Marine	Low	Significant sailing events occur annually offshore off Sydney, further consultation is required with offshore Sydney sailing clubs notably the CYC , RSYS and MHYC especially in relation to site mooring markers/navigational issues
Protected Areas (MPA's)	Low	The site borders the existing Bronte to Coogee Marine Protected Area.
Historical Ship Wrecks	Moderate	There are no wrecks likely to be a constraint on the site.
Offshore Mineral and Petroleum FAD'S (Fish Aggregation)	Moderate	Possibility of future exploitation of sand resources for beach nourishment and/or commercial purposes. Future extraction operations
Telecommunication Cables	Low	Further investigation is required. .
Anchoring Restrictions	High	One nautical exclusion zone required under federal legislation and this site is outside that restriction.
	High	The site is outside anchoring restrictions

Business Plan

Initial Costs

While it is impossible to fully quantify the project costs until a vessel has been acquired, the following estimates are based upon the experience of other artificial reef projects and preliminary guidance from contractors.

Cost Item		Amount
1. Project Management & Preliminary Works		
Site assessment	Can be extensive depending on vessel / location	\$ 50,000
Ship stability	Required for larger vessels	\$ 10,000
Project management fees	Will depend on extent of outside help	
Community liaison		
2. Preparation & Towage		
Pre-tow preparations		\$ 25,000
Tow costs	Wide variance depending on vessel & location	?
Wharfage	Wide variance - based on per metre per day	
Tow to Site	Wide variance - based on per metre per day	
3. Ship Preparation for Scuttling		
Hazmat Report and preliminary v	May not be necessary depending on vessel	\$ 25,000
Concrete ballast	May not be necessary depending on vessel	
Preparation works	Ship strip-out & diver access works	
Contingency for ship preparation work		
4. Scuttling		
Preparation works	All scuttling contractor expenses	
Explosives & materials		
5. Moorings & Navigation Aids		
Navigation Aids	May not be required - cardinal mark &/or IDM ?	
Moorings	If installed at time	
DEH Approvals	Sea Dumping permit	\$ 5,000
6. Management Costs		
Project costs	Administrative expenses for managers	
Legal Fees	Preparation of contracts & deeds	
Event management	Media etc.	
Insurance	Full coverage for entire project inc. at wharf, tow & scuttling	\$ 150,000
7. Contingency		
	General contingency holding	

** There will also be receivables of scrap & souvenirs etc depending on the ship.

In addition to these costs, as mentioned above the ship must be purchased from the RAN through a competitive tender process. Depending upon the vessel, this cost can be estimated to be \$250,000. Some of this cost will be recovered through scrap metal that is stripped from the ship prior to sinking. The total cost of the project is thus estimated to be >\$565,000, though the exact cost will only be able to be determined once the vessel is acquired.

It is envisaged that the project will be funded from a variety of sources, with the majority of funding being derived from Government grants. While industry and local SCUBA clubs will be able to contribute towards the initial project costs, the small size of the dive industry in Sydney precludes private sector funding. A user pay royalty is the preferred method for on going funding.

Ongoing Management Costs

Once the artificial reef is established, on-going management will be required to ensure that the site is maintained to a high standard and that critically the safety of the site is monitored. Again the cost of this management will be dependent on the structure of the management committee and vessel, but is unlikely to be substantial. The cost of the on-going management should easily be covered by revenue from commercial dive operators.

Revenues

It is proposed that the project's upkeep be self-funded through levies on commercial dive operators, a model that has successfully been applied elsewhere in Australia and overseas. In Queensland, the Government charges a \$10,000 p.a. mooring fee and \$15 per diver to commercial operators. While it is difficult to estimate the exact revenue streams in advance, the following estimates have been prepared based on industry input on the current situation in Sydney, and using the same charges as Queensland with 4 dive boat operators.

The following brief model includes both the increase in total divers using commercial operators as a result of increased publicity and attractiveness of the Sydney dive industry, as well as the percentage of these divers visiting the artificial reef. The model assumes that for any increase in the total number of divers utilising commercial dive services as a result of the

reef project, 80% will be visiting the reef itself. The other 20% represents additional dives at other sites as a result of the publicity surrounding the reef.

	Current	Current + 10%	Current + 20%	Current + 30%
Industry				
Fee per diver	\$125	\$125	\$125	\$125
Divers	16,000	17,600	19,200	20,800
Total Revenue	2,000,000	2,200,000	2,400,000	2,600,000
Reef dives (%)	20	25.5	30	34
Reef dives	3,200	4,500	5,750	7,000
Reef Managers				
Mooring fees	40,000	40,000	40,000	40,000
Diver fees	48,000	67,500	86,250	105,000
Total Revenue	88,000	107,500	126,250	145,000