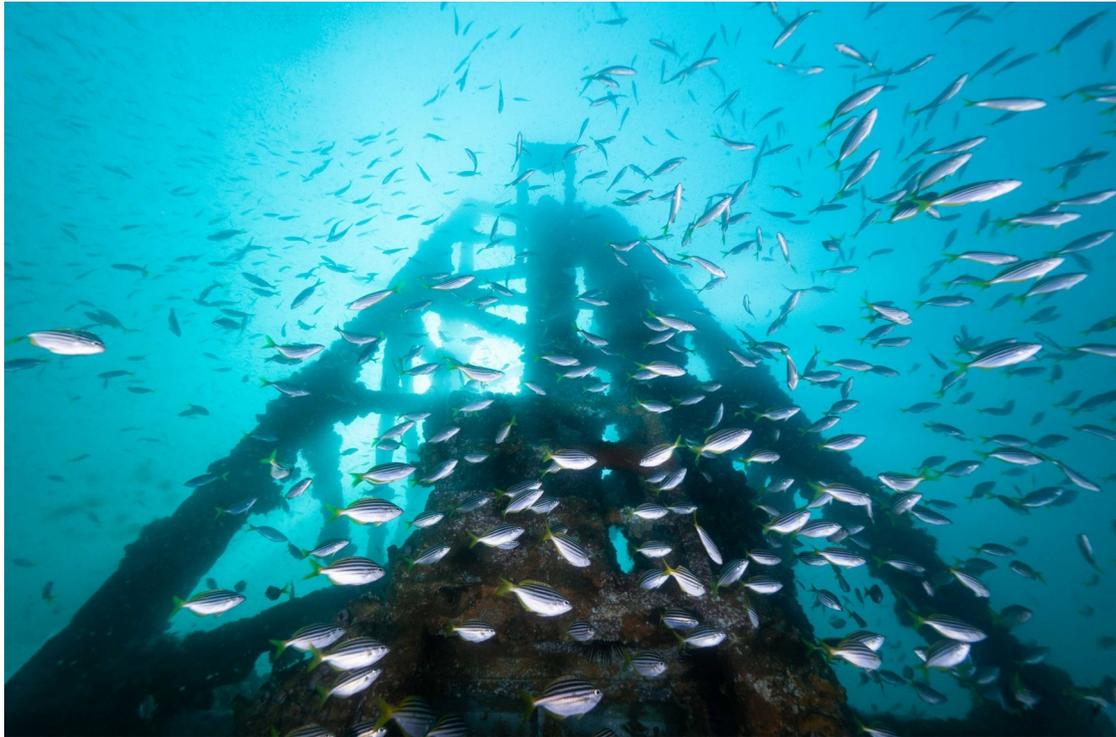


Sydney Dive Wreck Business Case

Prepared by the Gordon's Bay Scuba Diving Club Inc. (GBSDC)

Version 15 | 21st May 2020



Duncan Heuer photo of the ex HMAS Adelaide

‘Full fathom five thy father lies

Of his bones are coral made

Those pearls were his eyes

Nothing of him that doth fade

But doth suffer a sea change

Into something rich and strange

The Tempest, William Shakespeare

“Human beings have always been enchanted by the sea. This vision—to take an ex-Naval ship and give it a second life under the sea as a linked artificial reef and dive wreck—is a true act of transformation. Creating a new, world-class diving experience for Sydney is indeed about creating something “rich and strange”, so that those who love the sea, and everything in it, can truly experience what Shakespeare first called a sea change.” John Rowe, 2019.



Samson Fish (*Seriola hippos*) Offshore Artificial Reef (O.A.R) Port Macquarie NSW



Kingfish (*Seriola ialandi*) O.A.R Vaucluse NSW. An O.A.R to Wedding Cake Island will link the dive wreck-to to the natural reef for fishing enhancement.

Key proposal details

— SYDNEY DIVE WRECK BUSINESS CASE | GORDONS BAY SCUBA DIVING CLUB —

PROPOSAL NAME	SYDNEY DIVE WRECK
Lead proponent (e.g. Council)	Gordons Bay Scuba Diving Club (GBSDC Inc.)
Lead proponent ABN	68620082681, Association Incopr. Act, Y2110124
Proposal partners	Australian Government, NSW Government
Lead contacts	
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Proposal scope

This proposal seeks funding from the NSW Government to create a new dive wreck site and artificial fishing reef for Sydney by sinking an ex-navy vessel in recreational dive depths at Coogee NSW. Revenue is forecasted over five years of \$12.4m (low) and \$48.6m (high) at a one-off cost of \$6m-\$10m, is diver related. This estimate excludes any potential revenue from the linking artificial reef for fishing enhancement.

The project supports the strategic imperatives of the NSW Government and the Department of Industry (2.3). The proposed dive wreck has the potential for 100+ years of useful life, with very low post-sinking costs, high economic benefit, and significant recreational, research and environmental benefits for generations to come. There will be a significant spillover benefits for commercial and recreational fishers with the creation of a proposed artificial reef (O.A.R) from the dive wreck to Wedding Cake Island, in line with NSW DPI artificial reef program enhancing recreational fishing (DPI 2019). The GBSDC Inc. has consulted widely with the community (see Section 2.5 Stakeholder and community support) and a petition bearing over 13,500 signatures may be tabled in the NSW Parliament, requesting the NSW Government to make the necessary funds available for the project.

Proposal location

Proposal address	4 kilometers S.S.E from Coogee Beach, NSW
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Local government area	Randwick City Council
NSW electorate	Coogee, NSW
Federal electorate	Kingsford Smith, NSW

Acknowledgements

Member for Coogee: Dr Marjorie O’Neill

Former Member for Coogee: Bruce Notley-Smith

Coogee MPs officers, Dive industry representatives: Mark Cummins (PADI), Richard Nicholls (Dive Industry Association of Australia), Duncan Paterson (Dive Centre Bondi), Russell de Groot, and Rod de Groot (Pro Dive Australia)

Community representatives: Lynda Newman (Randwick Tourism), Bernadette Summers (Coogee Chamber of Commerce)

Environmental engineering: Ed Rowe, Maritime, and Coastal (Arup)

Independent environmental and marine science advisors: Professor Iain Suthers (UNSW) Professor William Gladstone (UTS)

Sydney Marine Park: Adele Pedder, Sharnie Connell

GBSDC representatives: Matthew Kempton, Sam Baxter (President), John Rowe (Founder, marine scientist)

Very special acknowledgement goes to:

Dive instructor Graham Willis for his significant help with this proposal

The helpful advice received from Michael Hukic Commonwealth Bank and Stephen Hall, Senior Consultant Forsythes

Also, to Warren Duncan Mazars and John Mullen (Chair, Australian Maritime Museum)

Table of Contents

Key proposal details.....	3
Proposal scope.....	3
Proposal location.....	4
Acknowledgements.....	4
1. Executive summary.....	8
About this proposal.....	8
What is an artificial reef?.....	8
Dive wrecks worldwide.....	9
Proposal location.....	10
Project potential.....	10
Community support.....	11
2. Case for change.....	12
2.1 Background, location, current use.....	12
Gordons Bay Scuba Diving Club Inc.....	12
Sydney Dive Wreck Organising Committee (SDWOC).....	14
Precedent for Federal Government support.....	14
Proposed location.....	15
Current use.....	15
2.2 Rationale for investment.....	16
Environmental rationale.....	16
Economic rationale.....	23
Research rationale.....	28
Community rationale.....	29
2.3 Strategic alignment with NSW Government objectives.....	32
Marine Estate Management Strategy (MEMS).....	32
Tourism.....	33
Alignment with the goals of the NSW Department of Industry.....	35
2.4 Expected outcomes.....	36

The NSW Government.....	36
The Department of Industry.....	37
Destination NSW.....	37
Bayside, Randwick Woollahra and Waverley local councils.....	38
Professional dive associations.....	38
Small businesses in Bayside, Randwick, Waverley and Woollahra.....	39
Sydney-based scuba dive operators.....	39
The recreational scuba diving community.....	40
Dive tourists (interstate and international).....	40
Summary.....	41
2.5 Stakeholder and community support.....	41
3. Analysis of the proposal.....	48
3.1 Objectives and indicators.....	48
3.2 The base case.....	48
3.3 The preferred solution.....	49
Alternative options.....	49
3.4 Information about this proposal.....	50
Proposal exclusions.....	51
Related projects.....	51
3.5 Projected costs.....	51
3.6 Cost benefit analysis.....	52
3.7 Financial appraisal.....	52
3.8 Proposed funding arrangements.....	54
3.9 Financial health and support.....	55
4. Implementation case.....	55
4.1 Program and milestones.....	55
4.2 Governance.....	55
4.3 Key risks.....	56
Service delivery.....	57

Health and safety.....	59
Location.....	60
Legal and regulatory.....	61
Financial.....	61
Administrative Appeals Tribunal.....	63
Stakeholders.....	64
Dive wreck moving to shore.....	65
Heavy metals risk.....	66
4.4 Legislative regulatory issues and approvals.....	69
4.5 Proposed management activities.....	71
Risk management and operations.....	71
Asset management and operations.....	71
5. Conclusion.....	72
6. Appendices.....	73
Appendix 1: Five year revenue, costs and surplus.....	73
Five year revenue:.....	73
Five year costs:.....	73
Five year surplus:.....	74
Appendix 2: Local Government Areas (LGA).....	77
Appendix 2a: Local Government Area map.....	77
Appendix 2 (b) Total visitors by LGA (year ending September, 2015).....	78
Appendix 3: Letters of support.....	79
Appendix 4: NSW Recreational dive centres—proximity to proposed Coogee site.....	80
Appendix 5: Coogee wreck dive site characteristics.....	83
Appendix 6: Sport participation table Australia (Source: Roy Morgan Research).....	84
Appendix 7: Ex-HMAS <i>Adelaide</i> scuttling.....	85
Appendix 7(a) Ex-HMAS <i>Adelaide</i> background and scuttling process.....	85

Appendix 8: Dive wrecks worldwide.....	89
Appendix 9: Sydney Dive Wreck alignment with the Marine Estate Management Act (MEMA) No 72, 2014.....	94
APPENDIX 10 NSW Electoral divisions.....	95
Appendix 10 (a) NSW Electoral divisions – petition analysis (highest to lowest signatures).....	95
Appendix 10 (b) NSW Electoral divisions petition analysis (by political affiliation).....	97
References.....	98

1. Executive summary- About this proposal

This is a proposal to create a new recreational dive site for Sydney, by sinking a decommissioned navy vessel off the Sydney coast for use as an artificial reef and dive wreck. There are currently 22 Royal Australian Navy ships scheduled for decommissioning in the coming years. It also proposes the creation of an O.A.R connecting the dive wreck to Wedding Cake Island, in line with the NSW DPI O.A.R program enhancing recreational and commercial fishing (DPI 2019).

What is an artificial reef?

For the purposes of this proposal, an artificial reef is defined as a vessel or other structure that is sunk intentionally as a recreational resource, including for diving, fishing, surfing, marine engineering, environmental restoration, or disposal. A shipwreck is a vessel that has sunk as the result of an accident or misadventure (Edney & Spennemann 2014). However, as this proposal is mainly for diving and fishing the terms dive wreck and O.A.R will be used interchangeably.



The ex-HMAS Adelaide—now experiencing a second life as an artificial reef and dive wreck Image courtesy of Duncan Heuer

Dive wrecks worldwide

Since 1984, more than 130 ships and aircraft (Appendix 8) have been sunk worldwide as dive wrecks. In Australia, seven ex-navy and three pirate ships have been sunk as dive wrecks, with an estimated economic benefit of \$30m per annum (Maura Bedloe Communications, 2016). Dive wrecks contribute millions of dollars to the economy and greatly assist biodiversity by acting as artificial reefs for a range of marine life. This proposal forecasts (excluding fishing) a low economic impact over five years of \$12.4m and a high of \$48.6m, at a one-off cost of between \$6m and \$10m—a cost-benefit ratio of between 2.1 and 4.8 (Appendix 1).



Divers travel the globe in search of ex-Navy vessel dive wrecks and artificial reefs.

Image courtesy of PADI

Proposal location: The proposed dive wreck site is located four kilometres S.S.E off the coast at Coogee. It is also proposed that an O.A.R (SubCon) will be built linking the dive site with Wedding Cake Isle. The wreck and O.A.R will not be visible from the beach, preserving the natural beauty and amenity of the area. A properly managed dive wreck has the potential for 100+ years of useful life (Gabriel et al. 2000), and will provide recreational activity and economic benefits for generations to come (Appendix 1). However, as this proposed project will attract a high level of public scrutiny, this proposal, and its location will need to be subject to a full and comprehensive analysis, similar to that produced by Worley Parsons (2009) for the ex-HMAS *Adelaide*.

Project potential

A Sydney dive wreck will be a great asset to Sydney's eastern beaches and to the one million Australians who participate in diving and snorkeling every year (Appendix 6). As well as its appeal to the Australian market (Appendix 1), the project has potential as an international diving attraction, as diving on ex-Navy ships holds significant appeal for recreational divers worldwide. The linked O.A.R will also appeal to recreational and commercial fishers.

There is a significant difference between attracting interstate and international divers to a Sydney dive wreck, compared to a location such as the ex-HMAS *Adelaide* at Avoca Beach, on the Central NSW Coast. The Sydney tourist market is 24 times as large as the Central Coast market. Sydney is a major tourist hub, with a wide range of existing attractions (LGA Randwick), which attracted more than 31.5 million overnight visitors in 2015 (Appendix 2a). Of these, 2.9 million were international visitors. This compares to only 1.3 million overnight stays in the Central Coast for the same period, including just 41,000 international visitors. Growth figures from Destination NSW (DNSW) confirm this difference, with Sydney recording over 9% annual growth in visitor expenditure. DNSW has also identified a significant market from China. 536,000 Chinese travelers visited NSW in 2015, and one in ten visitors from China went scuba diving during their trip to Australia (UTS: ACIR).

Community support The community overwhelmingly supports the proposal (See 2.1 & 2.5 Appendix 10 (a) (b)). The project has attracted a petition of over 13,500 signatures of support, which is to be tabled in the NSW Parliament.



John Rowe, his daughter Jessica Rowe and Ian Hunter celebrate a milestone 10,000 signatures enabling the petition to be tabled in Parliament for a Sydney dive wreck. By December 2019, the petition had acquired an impressive 13500+ signatures.

Project supporters include Michael Daley (MP for Maroubra), Marjorie O’Neill (MP for Coogee), Gabriel Upton (MP for Vaucluse), Felicity Wilson (MP for North Shore), and Matt Thistlewaite (Federal Member for Kingsford-Smith). The project aligns with the NSW Government’s strategic goals in the areas of sport and recreation, business activity, tourism, and the goals of sustaining conditions for economic development, increasing jobs, and investment in NSW, and an active recreation sector (Budget 2018).

2. CASE FOR CHANGE

2.1 Background, location, current use

Scuttling an ex-Navy ship to create a dive wreck in Sydney waters offers four key benefits to the state of New South Wales:

Economic: Provides a strong return on the investment with a payback period within 1–3 years. **Recreational:** Provides additional recreational opportunities for NSW residents and visitors by creating a new scuba diving site. Further, the linking of the dive site with O.A.R to Wedding Cake Island will further enhance both commercial and recreational fishing opportunities similar to the NSW DPI artificial reef program enhancing recreational fishing (DPI 2019) **Research:** Provides a new marine research site. **Environmental:** Increases the overall biomass of marine life in the dive wreck location and surrounding areas. Additional information about these benefits is provided throughout this business case proposal.

Gordons Bay Scuba Diving Club Inc.

This proposal is led by the Gordons Bay Scuba Diving Club Inc. (GBSDC)—an incorporated, not-for-profit association that was founded in 1993.

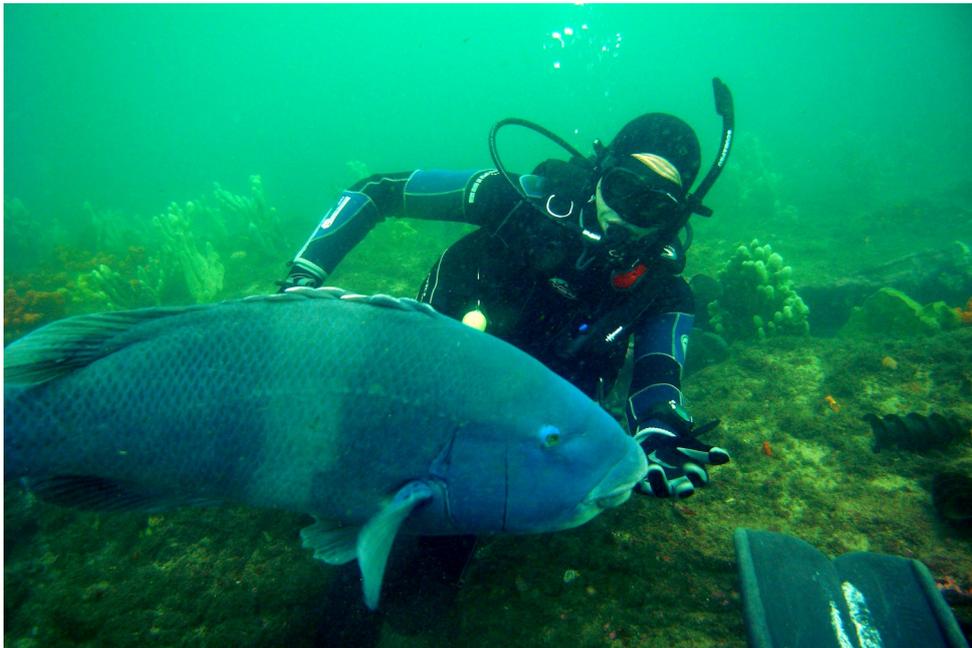


The GBSDC maintains the underwater nature trail (public reserve #1986/75) in Gordons Bay, between Clovelly and Coogee Beaches, NSW. Maintenance of the trail, which is ongoing, has involved more than 5,000 community service hours, 1,200 scuba divers, and 700+ dives. The club supports marine science research projects and

has received community service awards from PADI and the Sydney Morning Herald. The club has been advocating for a dive wreck for Sydney since 2005.

Bluey the groper, the NSW State Fish

Bluey the groper is the GBSDC's logo and proudly joins the NSW state fish emblem along with the state flower, the Waratah, the state animal the Platypus, and the state bird the Kookaburra. The dive wreck will become a new home for more Blueeys.



A diver interacts with our NSW state fish emblem- Bluey the Groper (Archoerodus viridis) Photo courtesy George Evatt

Sydney Dive Wreck Organising Committee (SDWOC)

The former MP for Coogee, the Hon Mr. Bruce Notley-Smith, to further explore community response and service delivery for the proposed dive wreck, established the Sydney Dive Wreck Organising Committee (SDWOC) in mid-2015.

The SDWOC members are:

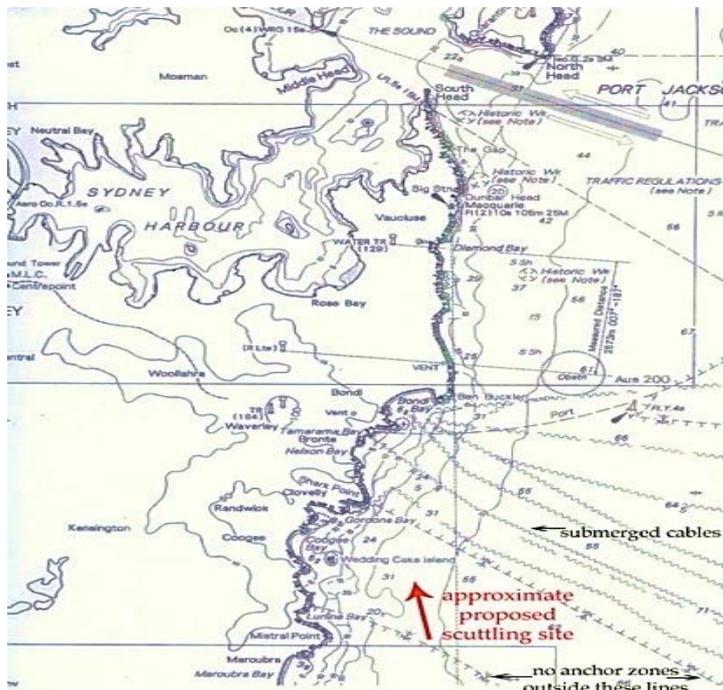
- Chair Dr Marjorie O’Neill, Member for Coogee, Jeremy Phillips Coogee MP’s office. Former Chair Bruce Notley-Smith
- Dive Industry Representatives PADI Mark Cummins Dive Industry Association of Australia – Richard Nicholls, Dive Centre Bondi – Duncan Paterson, Pro Dive Australia – Russell de Groot, Rod de Groot.
- Community Representatives Lynda Newman - Randwick Tourism Bernadette Summers Coogee Chamber of Commerce BJ Hatton Randwick Chamber of Commerce Adele Pedder, Sydney Marine Park
- Environmental Engineering Ed Rowe Arup, Maritime & Coastal.
- Independent Environmental and Marine Science advisors Professor Iain Suthers, UNSW Professor William Gladstone UTS
- GBSDC Representatives, Matthew Kempton, President Sam Baxter, Founder, & Marine Scientist John Rowe.

Precedent for Federal Government support

This proposal is based on the Federal Government gifting an ex-Navy ship for the project, and the NSW State Government fully funding the sinking & creation of an O.A.R and ongoing maintenance and management of the dive wreck in a manner similar to the ex-HMAS *Adelaide*. The Federal Government has already made two ships available in the past eighteen months—the ex-HMAS *Sydney*, which was scrapped in Fremantle WA at a cost of \$2.75m, and the ex-HMAS *Tobruk*, which was sunk in 2018 off the coast of Bundaberg QLD by the Queensland State Government at a cost of \$10m (www.abc.net.au/news/2018-10-13)

Proposed location: The proposed dive wreck site is located four kilometres S.S.E off the coast at Coogee, in recreational dive depths. The dive wreck is predicated on a complete ban of recreational and commercial fishing in an immediate area around the site, measuring 350 m x 250 m, similar to the ex-HMAS *Adelaide* (DPI 2010). The proposal also recommends the creation of an O.A.R, similar to those already created by the DPI (DPI 2019) with no fishing ban linking Wedding Cake Island to the dive site.

Proposed location of the Sydney Dive Wreck (Australian 2001)



Current Use

Presently, very little scuba diving activity occurs at the proposed location because of the sandy sea floor, which supports little marine life (Appendix 5). However, a sandy sea floor offers a perfect environment in which to sink a dive wreck and create a

linking O.A.R. Additionally, the site is adjacent to excellent diving at Wedding Cake Island, the Magic Point Grey Nurse Sanctuary, and Shark Point, Clovelly NSW. The addition of a dive wreck would only enhance the diving in the immediate vicinity of these existing sites.

The Sydney coastline does not currently have a dive wreck, and this proposal is seen as a companion to the dive wreck the ex-HMAS *Adelaide* (1V), which was sunk off Avoca Beach NSW in 2011. Concerns have been raised that this proposal will affect revenue from the ex HMAS *Adelaide*, however, overseas research contradicts this concern. As a comparative example, Morgan *et al.*, using a travel cost model, indicate an annual use value of \$A1, 735 per diver on specific dive trips to the dive wreck, ex-USS *Oriskany*, located off the Florida coast. However, if a second dive wreck is introduced, diver spend is estimated to increase to \$A3,700 (Morgan et al. 2009).

2.2 Rationale for investment

The rationale for investment in the project is based on four key factors—environmental, economic, research, and community:

Environmental rationale

In summary, the proposed dive wreck would:

- function as a new habitat for a multitude of fish and invertebrate species
- create effective marine habitats on what is otherwise a soft-bottomed, featureless environment (Appendix 5)
- provide corridors so smaller fish can safely move from one reef to another
- conserve pre-existing habitats while also forming new habitats of complex ecological systems.
- alters the connectivity patterns by linking the dive wreck to a natural reef with an O.A.R thus creating additional recreational and commercial fishing opportunities.

Whilst a fishing closure is planned for the dive site, the creation of an O.A.R with no closure leads to more fishing opportunities. Many studies have demonstrated this fact with a higher number of fishes, total living animals, and variety of species present on

artificial reefs, compared to natural reefs (Diamant et al. 1986, Bohnsack 1991, Bohnsack et al. 1994, Wilhelmsson et al. 1998, Clark & Edwards 1999, Rilov & Benayahu 2000, Arena et al. 2007, Burt et al. 2009). In contrast to Rilov and Benayahu (2000), Arena et al. (2007) observed greater species richness on concrete (SubCon) pillars (the principle component of the O.A.R) and shipwrecks, respectively. Fishing on dive reefs can rapidly reduce target fish populations and drastically decrease the value of a dive site for tourism (Brock 1994). Artificial reefs are good for fishing and divers but bad for fish (Arena 2013). In line with this, Arena et al. (2007) suggested that the high vertical relief of four vessel reefs studied might have accounted for the increased settlement of juvenile fishes, leading to greater recorded fish abundance and species richness.

In another study, Granneman and Steele (2014) found that total fish tissue production tended to be greater on artificial reefs than natural reefs, with a positive correlation occurring between tissue production and the abundance of large boulders that were more numerous on artificial reefs. However, some authors note that, given sufficient time and similar structural features, differences in benthic community structure can become almost indistinguishable

Three authors and their colleagues studied seven shipwrecks of differing ages (20 to 100 years old) and observed that the increasing age of the artificial reef influenced its degree of similarity to its adjacent natural reef (Aseltine-Neilson et al. 1999, Perkol-Finkel et al. 2006, Thanner et al. 2006). This was most evident with stony coral cover. Moreover, Perkol-Finkel et al. (2006) noted a similar benthic community structure on a 119-year old shipwreck to that of a neighboring natural reef. In contrast, only a handful of studies report less fish biomass and abundance on artificial reefs (Lindenberg 1973, Carr & Hixon 1997, Thanner et al. 2006, Simon et al. 2013), although this has frequently been treated as a dichotomic problem, attraction and production (Pickering & Whitmarsh 1997).

These two hypothesis are only the extremes of a gradient that can change within and among species, depending on the availability of natural reefs, mechanisms of natural population limitation, fishery exploitation pressure, and life history dependence on

reefs, and species-specific and age-specific behavioral characteristics (Simon et al. 2013).

It is also recommended that as much of the superstructure, masts be retained as possible to aggregate planktivorous fish, and cutting as many holes in the hull as possible. This is because oceanographically a wreck is essentially a 2-D surface where the flow is around and over the vessel, rather than through the structure. It would be useful if the dive community could rotate or replace two acoustic receivers every 6 months for any acoustic tagged fish and sharks (Suthers 2015).

It is recommended an O.A.R (Subcon) be installed as a corridor to Wedding Cake Island for ongoing biotic connectivity between the artificial and natural reefs. Additional anchors or mooring blocks (fish-friendly) may be necessary (Suthers 2015). As no fishing ban is proposed here this link is expected to enhance both commercial and recreational fishing opportunities. This area is roughly 5 times the size of the fishing closure over the dive site. in line with NSW DPI artificial reef program enhancing recreational fishing (DPI 2019).

Environmental perspectives on Australian dive wrecks—good or bad?

A 2019 study (Ilieva et al. 2019) reported on 1,907 intentionally deployed dive wrecks worldwide, that serve as artificial reefs. Of these artificial reefs, 168 are located in Australia (Appendix 8). Intriguingly, only 36 worldwide have monitoring assessments on their impact on the marine environment. Of those 36 monitored, 7 of the 12 sunk in Australia have been environmentally monitored (Ilieva et al. 2019). See table 1 for intentionally sunk ships in Australia.

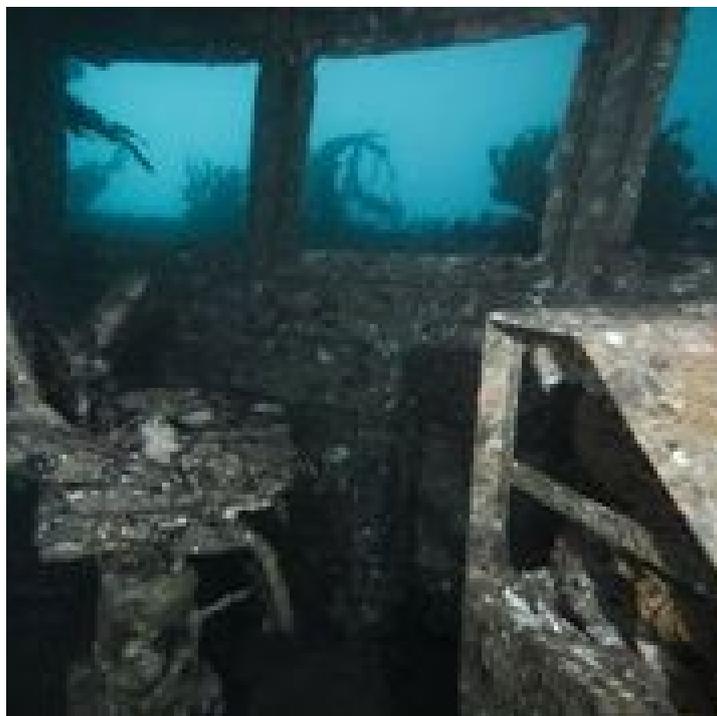
Table 1: Intentionally sunk ships in Australia serving as artificial reefs and dive wrecks (modified from (Reeds et al. 2017))

YEAR	SHIP NAME	TYPE	SIZE (m)	LOCATION	DEPTH (m)	ASSESS
1982	Cheyne 111 ¹	Whaler	48 x 8 x 5	Albany WA	23	¹ No
1997	Ex-HMAS <i>Swan</i>	Destroyer	112 x 12 x 24	Dunsborough WA	30	² Yes
2001	Ex-HMAS <i>Perth</i>	Destroyer	134 x 14 x 24	Albany WA	26	³ Yes
2002	Lena ⁴	Pirate fishing boat		Bunbury WA	18	⁴ No
2002	Ex-HMAS <i>Hobart</i>	Destroyer	133 x 14 x 24	Yankalilla Bay SA	28	⁵ Yes
2003	<i>South Tomi</i> ⁶	Pirate fishing boat		Geraldton WA	16	⁶ No
2005	<i>Saxon Ranger</i> ⁷	Pirate fishing boat	38	Rockingham WA	20	⁷ No
2005	Rockingham Dive Trail ⁸	2 MV / 2 planes		Rockingham WA	16	⁸ No
2005	Ex-HMAS <i>Brisbane</i>	Destroyer	133 x 14 x 24	Sunshine Coast QLD	27	⁹ Yes
2009	Ex-HMAS <i>Canberra</i>	Destroyer	138 x 12 x 24	Barwon Heads Vic	28	¹⁰ Yes
2011	Ex-HMAS <i>Adelaide</i>	Destroyer	139 x 14 x 24	Avoca Beach NSW	34	¹¹ Yes
2018	Ex-HMAS <i>Tobruk</i>	Heavy landing ship	127 x 18 x 5	Hervey Bay Qld	29	¹² No

(Cheynes 2019)¹ (Lena 2019)⁴ (Tomi 2003)⁶ (Ranger 2005)⁷ (Rockingham 2019)⁸

Continued- environmental perspectives on Australian Dive Wrecks- good or bad?

Monitoring surveys for metal corrosion and biomass development have been carried out on the ex-HMAS *Swan* (Morrison 2003)², ex-HMAS *Perth* (Morrison 2001, Richards 2004)³ and ex-HMAS *Hobart* (Morrison 2002, Richards 2003b)⁵. The Australian Institute for Maritime Archaeology (AIMA) reports that a new assessment is in process for the ex-HMAS *Hobart* (AIMA 2019)⁵. The ex-HMAS *Brisbane*⁶ was monitored for three years (Walker et al. 2007, Walker & Schlacher 2014). The authors state that the *Brisbane* is performing well as a premier dive attraction, enhancing recreational value with more than 200 dive days per year, and reducing the diving pressure on surrounding natural reefs. However, after just three years post-sinking, it is far too early to assess whether the dive wreck mimics the natural reefs. The ex-HMAS *Canberra*⁷ had an extensive environmental blueprint laid down prior to deployment (Crockett 2009). After six months of deployment, 26 species of fish had colonised the wreck, with the most abundant species identified as mackerel, long fin pike, four leatherjacket species, blue-throated wrasse, bullseye perch, and southern goatfish (Crockett 2010)⁷. *Note references 1-7 refer to Table 1.*



The HMAS Canberra—now a rich marine habitat.

The monitoring process has been summarised brilliantly by Reeds (Cardno 2016) as follows from pages 21-23 first paragraph:

“On 13 April 2011, the Ex-HMAS *Adelaide* was scuttled in front of an estimated 18,000 people off Avoca Beach, NSW. Firstly, a condition of the deployment was that the dive wreck managers—the NSW Department of Primary Industry—Lands (DPI) must implement a Long Term Monitoring and Management Plan (LTMMP). The monitoring requirements included three main components: *reef communities*, *sediment quality*, and *bioaccumulation*.

Reef communities

13 reef community surveys were carried out over the five-year monitoring period, in addition to the baseline survey undertaken in April/May 2011 by Worley Parsons.

The full methods and results of all reef community surveys can be found in Worley Parsons (2011b) and Cardno (2016a and 2016b).

After a baseline survey (Worley Parsons 2011) and 13 post-scuttling surveys (Cardno 2016b) 42 taxa/taxon groups were identified on the vessel. The ten most numerically abundant taxa, in terms of percentage cover, are serpulid worms, barnacles and encrusting algae (57.8%), large barnacles and brown filamentous algae (7.2%), solitary ascidians (6.7%), serpulid polychaete (6.5%), jewel anemones (4.4%), brown filamentous algae (4.3%), kelp (2.3%), early colonising matrix (2.2%), base surface (1.3%) and red encrusting algae (1.3%) (Cardno 2016a and 2016b).

Fish taxa identified during the 13 post-scuttling surveys on the ex HMAS *Adelaide* included 62 species from 31 families. There was a clear increase in the number of species identified over time. No species of threatened or protected fish were recorded (although anecdotal evidence suggests that grey nurse sharks (*Carcharias taurus*) may occasionally occur at the site.

No listed marine pest species were detected during the first five years of monitoring, however, it was noted that the survey methods adopted may mean

that small and cryptic pest species would be difficult to identify, as they can be well camouflaged or found in crevices and overhangs.

Sediment quality

The aim of the sediment quality monitoring survey, as outlined in the LTMMP, was to gain an understanding of how metal corrosion and degradation of paint layers may be influencing/impacting on the marine environment and whether benthic organisms are likely to be affected by metal enrichment.

The LTMMP stipulated that sediments be tested for aluminum, iron, chromium, copper, lead, nickel and zinc, as these metals are associated with the ship's materials, particularly the hull (which is made of steel) and the superstructure (which is composed of aluminum).

In addition, metal concentrations in sediments recorded at 62 months post-scuttling (June 2016) were similar to those recorded one month post-scuttling (May 2011) indicating no significant long-term effects on sediment quality as a result of the vessel being scuttled (aluminum was an exception). All metals measured for which ANZECC/ARMCANZ (2000) ISQG are available (i.e. chromium, copper, nickel, lead and zinc), had concentrations that were well below the ISQG low trigger values and therefore were not considered to be a contamination risk to the marine environment (see pages 33-34)

Bioaccumulation

Biomonitoring was carried out to determine whether resident biota were likely to be affected by zinc chromate paint, which may have been used on the aluminum alloy of the ex-HMAS *Adelaide* while in service.

Bioaccumulation surveys were undertaken one, seven, and 15 months post-scuttling. In general, results indicated that zinc and chromium that could potentially leach from the exHMAS *Adelaide* would not affect the levels of these metals in filter feeders living in association with the vessel. Furthermore, the levels of zinc and chromium recorded in the tissues of sentinel species

were generally similar to background levels recorded at their source and would not be of toxicological significance to the marine environment.’

In conclusion: dive wrecks good or bad

The ex-HMAS *Adelaide* has set the gold standard for how to prepare, scuttle, and monitor a dive wreck. This example demonstrates that there is categorically no scientific basis for any objection to the proposal for a dive wreck in Sydney waters on environmental grounds. This proposal is undeniably positive for the marine environment. The creation of a proposed O.A.R to Wedding Cake Island from the dive site will also enhance both commercial and recreational fishing opportunities. (DPI 2019).

Economic rationale

Ocean-going ships have an average life cycle of approximately 28-35 years. At the end of their lifespan, they are scrapped mainly for their recyclable steel (Glisson & Sink 2006). However, it is this proposal’s recommendation that a dive wreck is a much more sensible, sustainable and economically viable option for the state of NSW than any other option. Consider the following:

In 2017, the ex-HMAS *Sydney* (IV) cost the Australian Federal Government over \$2.75m to tow and scrap in Fremantle WA after the NSW Government rejected the offer to create her as a dive wreck (Anon). A dive wreck has a useful life of up to 100 years or more (Gabriel 2004).



the ex-HMAS Sydney (IV) being scrapped in Fremantle WA. What an ignoble end for a great warrior?

The economic and community benefits of a dive wreck for the NSW community far outweigh scrapping and honor the work of her ships company. Our proposal estimates revenue over a five-year period of between \$12.5m and \$48m **(Appendix 1)**.

However, there is no reason to assume that the proposed dive wreck would not continue to earn income for the NSW community for the potential 100 years of its life—a far more sustainable option for a decommissioned ship than scrapping.



Diving on the ex-HMAS Adelaide a much greater fate than the scrapping option

Marine tourism and recreation activity is a rapidly increasing phenomenon (Orams 2002). Dive wrecks, and the large and charismatic marine life they attract, sustain nature-based tourism markets (Gallagher & Hammerschlag 2011). For example, the SS *Yongala*, which was wrecked off Townsville in 1911, is now regarded internationally as one of the greatest attractions for dive tourists (Cafiero 1992). The *Yongala* has been rated as one of the world's top ten best dive shipwrecks in the world (Wood 2012), and more than 10,000 divers from all over the world visit the wreck

every year. At 110 meters long, she is one of the largest, most intact historic shipwrecks in the world, and has survived for 110 years (Wikipedia 2016).

Other, more recent dive wrecks include the ex-HMAS *Tobruk*, which was sunk as a dive wreck off the coast of Bundaberg and the Fraser Coast on 28 June 2018. The Break O 'Day Council had previously submitted an unsuccessful proposal for the ex-HMAS *Tobruk* to be scuttled at Skeleton Bay, off the north-east coast of Tasmania (Maura Bedloe Communications, 2016).

The HMAS *Darwin* was decommissioned in December 2017, and was to have been scuttled as a dive wreck at Skeleton Bay, however, the Tasmanian government declined to support the project (Mercury 2018).

The proposed dive wreck at Coogee would follow the example of the ex-HMAS *Adelaide*—recognised as the leading example of an environmentally sustainable dive wreck.

Several factors support the proposed dive wreck at Coogee as an economically viable project:

- The proposed site is offshore from Coogee, approximately four kilometres from Coogee Beach.
- The site satisfies all of criteria for a dive wreck site (Appendix 5).
- A dive wreck would provide a significant boost to tourism in eastern Sydney and NSW. The proposed dive wreck is expected to generate diving revenue of between \$1.9m and \$3.9m per annum. Tourism spend is estimated to be an additional \$1.5–\$6.9m—a total per annum revenue estimate of between \$3.4m and \$10.8m (Appendix 1). The estimated one-off cost of the project is approximately \$6.5m (Appendix 7). McMahon Services 2011, with some other estimates putting the cost as high as \$10m (Johnston 2013).
- 5,200 tonnes of scrap from the ex-HMAS *Adelaide*—aluminum, brass, copper, lead and steel—was sold for an estimated \$1.4m, at current prices (Parker 2016). Using an ex-navy vessel as a dive wreck will provide substantially more revenue than selling it for scrap. In addition, a dive wreck does not incur scrapping costs, which amounted to \$2.1m for the ex-HMAS *Sydney* (1V),

with the full value of the scrap sale going to the scrapping contractor, rather than taxpayers.

In NSW, the scuba diving market is valued at \$300m (Nicholls 2014). Nationally, it is valued at \$1b from international visitors and \$547m from Australian divers (Worley Parsons 2009).

Beaver and Kelly (2015) value the market at \$2.2b—comprising club divers \$125m, domestic tourists (\$406m), and international tourists (\$1.7b). In NSW in 2015, dive-related spend was valued at \$513m. Nationally, nearly one million Australians participate in diving and snorkeling each year (Appendix 6).

These figures make a strong case supporting the allocation of financial resources to fund the project (Appendix 7).

As previously mentioned, this proposal forecasts revenue over five years of \$12.4m (low) and \$48.6m (high), at a one-off cost of between \$6m and \$10m—a cost-benefit ratio of between 2.1 and 4.8 (Appendix 1).

In addition, a dive wreck site in Sydney will diversify dive offerings and create a more attractive destination for this market. Other studies have shown that specialist dive offerings do not flow solely to the industry, but are also spread across the region where it is hosted. For example, from March 2013 – June 2014, shark divers in Australia contributed \$25.5m to the local economy (Huveneers 2017). Dicken et al. (2014) calculated that from July 2011– July 2012 in Sodwana Bay, South Africa, divers spent \$7.2m. Du Preez et al. (2012) calculated that the per capita spend on tiger shark diving in the Aliwal Shoal, South Africa, was \$198m. In Fiji, shark diving contributed \$55.5m to the Fijian economy (Vianna et al. 2011). Catlin *et al* demonstrated that, in 2006, whale shark divers in Ningaloo Marine Park WA, generated total expenditure in the region of \$6.0m and divers spent \$894 per trip. \$4.6m would have been lost to the region if whale shark tourism did not exist (Catlin et al. 2010).



‘I would spend \$200,000 on a new dive charter boat, if the dive wreck goes ahead.’

Yves Moulard, Scubaroo Dive Charters Sydney Dive Expo 2019

Research rationale

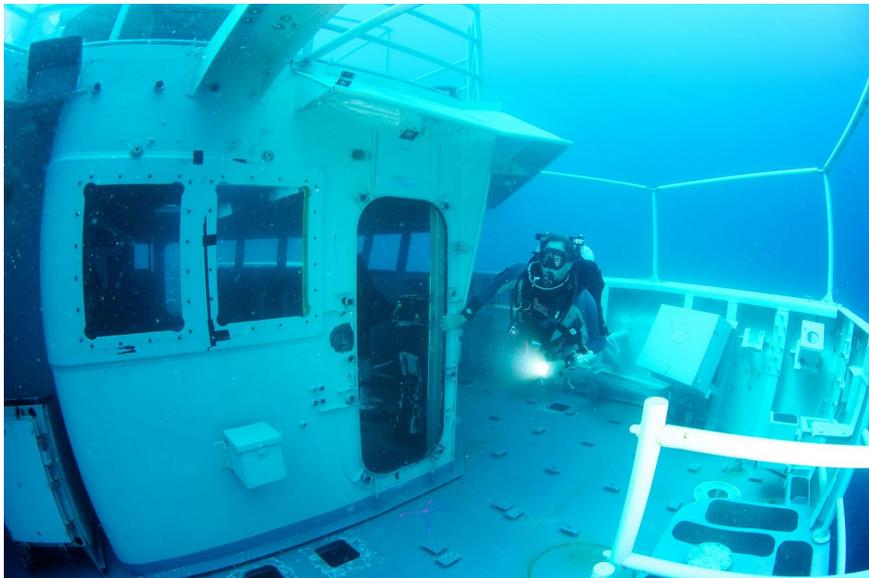
The Sydney Institute of Marine Science (SIMS) may undertake research projects at the proposed site, including:

- fish connectivity with natural rocky reefs and a dive wreck
- quantification of the role of planktivorous fish to the \$50b blue economy (Bennett et al. 2016) based on tourism, fisheries, and sustaining recreational fishing around artificial reefs
- assessment of fish movements with acoustic telemetry
- researching links with artificial reefs outside the dive area
- teaching with web cams on the reef and underwater sculptures in the lee of the dive wreck (Suthers 2019).
- The dive wreck may attract large crustaceans (Howard 1980) and is a potential site for a research project on the Sydney rock lobster (*Sagmariasus verreauxi*) (Spanier et al. 2011). The installation of passive collectors and concrete

housings (Jensen et al. 2012) for spiny lobster post-larval puerulus in the dive wreck prior to sinking may supplement natural habitats to increase survival rates of post-larvae by increasing the availability of settlement sites (Spanier et al. 2011).

Community rationale

Dive wrecks are much sought-after by recreational scuba divers. When asked to state their most favoured type of artificial reefs to dive on, 76.5% of surveyed divers selected large ex-navy ships (Kirkbride-Smith et al. 2013).



Diving on the ex-HMAS Adelaide Photo Rob Westerdyk

(Kirkbride-Smith 2014) supports the view of GBSDC that the proposed dive wreck—a large ex-naval vessel in a preferred depth range—will meet the needs and expectations of recreational divers (Milon 1989, Ditton et al. 2002, Stolk et al. 2005, Shani et al. 2012).

In addition, dive wrecks are viewed as effective conservation tools (Stolk et al. 2005). They provide a range of enhanced opportunities for divers, beyond the physical experience of scuba diving, including historical significance, marine life photographic opportunities and support for management controls over dive wrecks (Edney 2012). Dive wrecks also reduce the human impact on historic shipwrecks (Edney & Spennemann 2015).



Ex-Naval dive wrecks offer diverse experiences for divers—adventure, wildlife, photography and history. Image courtesy of PADI

A land-based memorial to the men and women who served in all RAN ships would fit well into the Coogee coastline (John Byrne pers. com. 2017).

There is also potential for a 24-hour camera link, to enable non-divers to experience the wreck from dry land.

The community has shown strong support for the proposed dive wreck, and the proposal has a growing base of 18,000+ supporters, including:

- 3,000+ signatures on a Change.org petition (www.change.org Sydney Dive Wreck)
- 1,500+ likes on the Sydney Dive Wreck Facebook page, with notable like from David Handley, Sculpture by the Sea See pages 42 & 43 for Recreational Fishing Alliance's concerns.
- 13,500+ signatures on a paper petition to be tabled in the NSW Parliament.

Articles about the proposed dive wreck published in The Beast Eastern Suburbs Community Magazine and Dive Log National Scuba Trade Magazine have been met with a positive response (Rowe 2013, Rowe & Log 2015). **See Section 2.5**

Stakeholder and community support for additional media.

Numerous letters of support have also been received from marine scientists, members of the dive community, Government and political representatives (**see Section 2.5 Stakeholder and community support**).

2.3 Strategic alignment with NSW Government objectives

The proposal to acquire and scuttle an ex-Navy ship as a dive wreck in recreational diving depths off Sydney's coastline aligns with the strategic imperatives of the NSW Government and the Department of Industry.

Marine Estate Management Strategy (MEMS)

The suggested dive wreck site at Coogee borders the NSW Government's Marine Estate Management Strategy 2018 (MEMS) (Appendix 9), which proposes 25 distinct sanctuary/conservation zones (NSW Government 2018b). The dive wreck proposal fully meets the primary objectives of the MEMS for the proposed Bronte-Coogee site (https://www.marine.nsw.gov.au/_data/assets/pdf_file/0019/821323/Hawkesbury-site-Bronte-Coogee.pdf) as follows:

The proposed dive wreck site will:

- enhance the conservation of marine biodiversity
- promote marine ecotourism in the bioregion
- continue to provide for marine economic opportunities that are consistent with ecologically sustainable development—for example, low-risk commercial fishing activities
- establish and maintain public infrastructure to support access and use of the bioregion—for example, moorings and boat ramps
- enhance the intrinsic benefits derived by the community from the marine estate
- enhance bequest values for current and future generations
- reduce conflicts between users of the marine estate
- provide enhanced recreational experiences for particular user groups
- provide baseline monitoring areas (scientific reference sites)
- ensure that appropriate mechanisms exist for community involvement in the management of the marine estate
- promote stewardship of the marine estate.

Unfortunately, the Marine Estate Management Authority (MEMA) did not examine the Sydney Dive Wreck proposal, only listing it as a received submission, in the Appendix in spite of the request by Minister Niall Blair in a meeting on 16th November 2016 at the NSW Parliament for MEMA to consider the proposal.

Tourism

This proposal supports the NSW Government's focus on sports and recreational facilities, as well as directly supporting broader economic growth and an increased focus on driving growth in tourist numbers and spend.

<https://www.budget.nsw.gov.au/sites/default/files/budget-2018-06/NSW%20Budget%202018-19%20-%20Budget%20Overview-1.pdf>

The 2018-2019 State Budget made it clear that the following three areas remain a focus:

Sports and recreation

One of the key areas of the 2018-2019 State Budget is a focus on “Sports, arts and culture for all.” The investment of \$937.7M in sporting facilities in Sydney and the \$25M Regional Sports Infrastructure Fund demonstrate that the NSW Government is building facilities that will be used by the broad community for many years to come.

A dive wreck will have a useful life of at least 100 years, Unlike the major investment the Government is choosing to make in establishing world class sporting facilities in NSW, this facility would require minimal investment after the initial purchase, preparation, EIS and sinking of a ship.

Business activity

In the 2018-2019 State, Budget the Treasurer noted that, *‘The Government is investing in initiatives that will attract, support, and encourage business activity across New South Wales.’*

Most of the positive impact in scuttling an ex-Navy ship in Sydney waters will be felt by a wide range of small businesses. The NSW Government supports

this section of the business community through the NSW Small Business Strategy. The 2017-2018 Budget continues this support with increased thresholds for small business.

http://www.industry.nsw.gov.au/_data/assets/pdf_file/0003/107643/nsw-small-business-strategy.pdf

Placing an ex-Navy dive wreck in Sydney waters will increase revenues for dive shops through increased boat traffic, dive courses (notably wreck and deep water courses) and the sale and hire of scuba equipment. A range of businesses in the proximity of the wreck site will also benefit, including cafes, restaurants, service stations, car hire, hotels and ships chandleries.

Tourism

In addition to the significant investment in sporting facilities made by the NSW Government in the 2018-2019 Budget, the Government also invested \$173m for Destination NSW to support the delivery of the Visitor Economy Industry Action Plan:

<https://www.industry.nsw.gov.au/invest-in-nsw/industry-opportunities/tourism/industry-action-plan-tourism>.

The tourism sector brings enormous value to the state. As the Minister for Tourism, Major Events, Hospitality and Racing noted in his 2012 foreword in the NSW Government's response to the final report of the Visitor Economy Taskforce, '...the NSW visitor economy is worth more than agriculture, forestry and fishing, and just below mining.'

https://www.industry.nsw.gov.au/_data/assets/pdf_file/0007/53683/121218_VE-IAP-Full-version_FINALv2.pdf

The proposed dive wreck will attract interstate and international tourists, who will be drawn by the opportunity to dive two ex-Navy vessels (the new proposed wreck and the ex-HMAS Adelaide off Avoca Beach). This opportunity will be far more appealing to divers, than just diving the considerably less accessible ex-HMAS-Adelaide. Morgan et al using a travel cost model indicate an annual use value of \$A1,735 per diver on specific dive trips to the ex-USS *Oriskany*. However, if a

second dive wreck is introduced they estimate an increase of diver spend to \$A3,700 (Morgan et al. 2009).

Alignment with the goals of the NSW Department of Industry

Repurposing an ex-Navy ship as a new dive wreck site supports the following Departmental goals:

- Sustaining the conditions for economic development
- Support to increase jobs and investment in NSW
- Foster a vibrant and valued sport and active recreation sector

<https://www.industry.nsw.gov.au/about/our-business/our-priorities>

In turn, this directly aligns to the ‘What we do’ components of the 2015-2019 Corporate Plan in the following areas:

- Promoting a vibrant and valued sport and active recreation sector that enhances the lives of the people of NSW
- Growing the visitor economy of NSW by promoting our attractiveness as a major tourism centre and destination for events
- Supporting small businesses in NSW to start and grow.

Aside from the economic, recreational, and environmental benefits that this project presents, it also aligns with one of the department’s key attributes, offering an opportunity to **‘Think and act creatively to lead the way’**.

https://www.industry.nsw.gov.au/_data/assets/pdf_file/0011/108884/NSW-Department-of-Industry-Cluster-Corporate-Plan-2015-2019.pdf

2.4 Expected outcomes

The proposed dive wreck benefits several discrete groups of stakeholders. The key beneficiaries are:

- The NSW State Government

- The NSW Department of Industry
- Destination NSW and Sydney.com
- Bayside, Randwick, Woollahra and Waverley local councils
- Professional dive associations
- Small businesses in Bayside, Randwick, Woollahra and Waverley
- Sydney-based scuba diving operators
- The recreational scuba diving community
- Dive tourists (local, interstate and international).
- Recreational and commercial fishers.

The following summarises the benefits of the project for each stakeholder group:

The NSW Government

The NSW Government has summarised its approach as ‘Building for tomorrow and delivering today’. The sinking of an ex-Navy ship in Sydney waters for the purposes of recreational diving does just that. It delivers a facility in the short term that the active diving community of NSW—currently estimated at 8,000–16,000 divers—will continue to benefit from for the next 100 years (Appendix 1).

- Summary of tangible benefits:
- Increased revenues of \$2.5m–\$9.7m over five years.
- Supporting the Government’s stated policies of:
- Keeping our environment clean (divers are extremely environmentally aware advocates for the marine environment)
- Tourism (attracting interstate and international visitors to Sydney)
- The provision of recreational facilities (in alignment with current NSW Government commitments, with a much longer period of positive return for minimal ongoing operational costs)
- The promotion of a healthy lifestyle (scuba diving requires and promotes good levels of health and fitness)
- Support for small business (main financial beneficiaries are Sydney dive operators and local businesses in the vicinity of the dive site)

The Department of Industry

The proposed dive wreck directly meets the following components of the Department's goals,

- Sustaining conditions for economic development
- Support to increase jobs and investment in NSW
- Foster a vibrant and valued sport and active recreation sector

Destination NSW

Destination NSW's role is:

- To market Sydney and NSW as one of the world's premier tourism destinations
- To develop and deliver initiatives that will drive visitor growth throughout the state
- To achieve the NSW Government's goal of doubling expenditure within the state's visitor economy by 2020.

The sinking of an ex-Navy ship provides a destination experience that would be a feature on Sydney.com (under the auspices of Destination NSW) and directly supports all of these projected outcomes.

Bayside, Randwick Woollahra and Waverley local councils

Given their proximity to the proposed dive site, these four councils are likely to receive the largest financial benefit from the project. Studies have shown that in addition to the actual revenues directly associated with the act of diving on such a wreck that there is an additional spend of between \$5.4m and \$31.3m over five years (Appendix 1).

Professional dive associations

The NSW-based professional dive associations that will benefit most from the proposed dive wreck are:

- PADI (Professional Association of Dive Instructors)
- SSI (Scuba Schools International)
- RAID (Rebreather Association of International Divers)
- TDI (Technical Diving International) and SDI (Scuba Diving International).

PADI trains approximately 75% of all Open Water Scuba certifications in NSW and will therefore reap the most benefit from the project.

It is likely that the presence of an ex-Navy vessel dive wreck site close to Sydney will, of itself, create enough new interest in diving to prompt an increase in new Open Water Scuba certifications. However, what is certain is that demand for speciality certifications, including PADI Deep Diver or equivalent (certification to a depth of 40 metres) and Wreck Diver will increase markedly.

Small businesses in Bayside, Randwick, Waverley and Woollahra

Studies have shown that direct dive spend ranges from 13%–26% of a diver's total expenditure. Perhaps more importantly, non-dive spend ranges from 74–87% of a diver's total expenditure (Pendleton 2004, Escobedo 2007).

Local businesses will benefit directly from this project, especially considering the findings of studies, which have shown that visitors always bring more to the economy than locals (Bell et al. 1998, Johns et al. 2001, County 2004, Adams et al. 2006, Oh et al. 2008, Tapsuwan & Asafu-Adjaye 2008, Wheaton et al. 2008, Leeworthy 2011a, Huth et al. 2015).

Marsden Jacobs Associates reports that in nature-based travel, day trip expenditures largely comprise shopping (28%), petrol (25%), food and beverages (12%) and takeaway or restaurant meals (20%). For overnight visits, major expenditure items are accommodation (25%), domestic airfares (15%), takeaway/restaurant meals (15%), petrol (10%), food and beverages (12%) and shopping (8%) (Jacob 2017).

Sydney-based scuba dive operators

The 21 dive operators (Appendix 3) located within easy access of the proposed location certify 4,000–5,000 new divers per year. This means that, in the last five years, 20,000–25,000 new divers have been certified in the Sydney area. For the purposes of the business case embedded in this document, we have applied a much lower conservative estimate of 8,000–16,000 active scuba divers (Appendix 1).

In addition to their Open Water Certification (the first qualification for any diver), between 20% and 30% of those divers will progress to a higher certification or specialty that provides them with the training to safely undertake deeper dives. There is a measurable drop off in diving activity following initial certification, and this is reflected in the business plan.

Based on activity associated with the sinking of other ex-Navy vessels as dive wrecks, we estimate, that dive certifications in Sydney will increase by 10–15% if a new ex-navy dive wreck is installed at the proposed location.

The recreational scuba diving community

Providing world-class facilities gives recreational divers compelling reasons to remain in their sport and increase their fitness, health and wellbeing, as well as creating a powerful group of environmental advocates. This proposed ex-Navy vessel dive wreck will put Sydney on the world diving map in a new and compelling way.

Dive tourists (interstate and international)

In 2013, scuba diving was recognised as ‘one of the world’s fastest growing recreational sports’ (Musa & Dimmock 2013). PADI, one of the world’s leading scuba certification agencies, certifies more than one million divers per year and has certified more than 25 million divers over the life of the organisation. Both of these statistics continue to grow, and a new high quality dive attraction—such as an easily accessible ex-Navy dive wreck in Sydney—creates an opportunity to attract some of that growing pool of scuba divers.

Diving is an equipment-intensive sport that benefits from a continuing investment in ongoing education, equipment and the servicing of that equipment. Divers are willing to save and spend significant sums on their diving experience (Binney 2009).

Recreational and commercial fishers

It is recommended reef balls (SubCon) similar to the artificial reefs in the NSW Government’s O.A.R (DPI 2019) be installed as a corridor to Wedding Cake Island for ongoing biotic connectivity between the dive site and natural reefs. Additional anchors or mooring blocks (fish-friendly) may be necessary (Suthers 2015). As no fishing ban is proposed here this new artificial reef is expected to enhance both commercial and recreational fishing opportunities. The connecting reef is roughly 5 times the area of the dive site-fishing ban.

Whilst there is a fishing ban on the site, the dive wreck will have a spillover effect which will attract fish, crustaceans (Howard 1980) and is a potential site to enhance the Sydney rock lobster fishery (*Sagmariasus verreauxi*) (Spanier et al. 2011). The installation of passive collectors and concrete housings (Jensen et al. 2012) for spiny lobster post-larval puerulus in the dive wreck prior to sinking may supplement natural habitats to increase survival rates of post-larvae by increasing the availability of settlement sites (Spanier et al. 2011) and may enhance commercial fishing. See page 42 & 43 for recreational and professional fishers concerns.

Summary

The proposed sinking of an ex-Navy vessel in Sydney waters has a wide range of beneficiaries beyond the scuba divers who will directly access the dive site.

We believe that, by taking a leading role in this project, the NSW Government will create a lasting legacy, contribute to the State's bottom line, and fulfill a number of the Government's policy positions. Just as importantly, leadership in this project will mean not ceding ground to the Queensland dive and tourism industry, which, with the support of the Queensland State Government, has recently sunk its second ex-Navy ship, the ex-HMAS *Tobruk*.

2.5 Stakeholder and community support

Over the past seven years, the Sydney Dive Wreck Committee and the GBSDC (the proponents) has consulted widely with stakeholders and the broader Sydney community regarding this proposal. More than 40 letters of support have been received and are held on file (these are available on request from John Rowe at jcprowe@bigpond.net.au). **A summary is listed at Appendix 3 with letter reference.**

Table 2.5.1 outlines the project's key stakeholder groups, their engagement with the dive wreck proponents, any issues and concerns raised by these groups, and how this proposal has addressed these concerns.

SYDNEY DIVE WRECK BUSINESS CASE | GORDONS BAY
SCUBA DIVING CLUB

Table 2.5.1 Summary of stakeholders and community support

STAKEHOLDER GROUP	SDW ENGAGEMENT	CONCERNS RAISED	ADDRESSED BY
Commonwealth Government (Defence)	Meetings with Defence Minister (2013/2017)	None – very supportive	
NSW Government (Primary Industry)	Meeting with Niall Blair and Department November 2016	Four areas of concern raised: <ul style="list-style-type: none"> • Financial • Environmental • Health and Safety • Community engagement 	All concerns addressed in response to Department in December 2016 Submission made to MEMA (excluded from the strategy)
NSW Government (Tourism)	Meeting requested 2017		Previous ministers supportive
NSW Government (Environment)	Meeting with Minister scheduled August 2018		Minister supportive
Randwick Council	Various meetings with individual councilors	No concerns raised	
Randwick Tourism	Continuous involvement	Very supportive – Member of Sydney Dive Wreck Organising Committee (SDWOC)	
Local precinct committees	Presentations or invitations to Coogee, Malabar, Maroubra, Clovelly and Bronte Beach	No concerns raised	No response from Malabar, Clovelly and Maroubra
Sydney Coastal Councils	Various meetings 2016/2017	No concerns raised	
NPA Marine	Various meetings 2016/2017	No concerns raised	
Recreational Fishing Alliance of NSW (RFA)	Various meetings	Written commercial sector approval? Written charter sector approval? Written DPI approval? ACMA approval in writing? Announced funding for proposal.	Further discussion required RFA continued

— SYDNEY DIVE WRECK BUSINESS CASE | GORDONS BAY SCUBA DIVING CLUB —

		Increased boat ramp congestion? ROI on ex HMAS Adelaide? Final case to be prepared by NSW Government? Noncommercial divers access?	
NSW Recreational Fishing Advisory Council (RFNSW)	Meetings 2019	Not adverse to fishing closure similar to the Adelaide noted the socio-economic benefits of a dive wreck	RFNSW noted still a proposal.
Wildlife Fishing Coalition	Meetings with SFFP at NSW Parliament	Proposed site & link reef is a current fishing site	WFC to propose alternative sites
Professional Fishermen's Association	More meetings needed	Latest dive wreck proposal sent	Trawl ban from Malabar to Long Reef
Coogee Chamber of Commerce	Various meetings 2016/2017	No concerns raised	Very supportive Member of SDWOC
Marine research organisations	Various meetings 2016/2017	No concerns raised Scientific advisors appointed to review plans Numerous letters of support from marine scientists	
Nature Conservation Council	Correspondence and discussions 2016	No concerns raised	
Surf Live Saving Clubs	Presentations to South Maroubra No response from Clovelly and Coogee clubs	No concerns raised	
Dive Industry of Australia	Continuous involvement	Very supportive Member of SDWOC	
Royal Australian Navy	Informal engagement with numerous ex-Navy staff	Very supportive Letters of support provided	
Sydney local	Significant	Overall, very	

community	engagement (see details below)	supportive	
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The Dive Wreck proponents has been very actively engaged in raising awareness of the plans outlined in this proposal within the community in Sydney’s east, particularly Coogee. The support has been very overwhelmingly positive, evidenced by:

- 13,500+ signatures on a paper petition to the NSW Legislative Assembly
- 3,500+ signatures on an online petition to the NSW Government
- 1,700+ Likes on the Sydney Dive Wreck Facebook page.

Over the last three years, the proponents have raised community awareness of the project at a wide range of community events and activities, including:

Stalls at major local community fairs and festivals:

- Randwick Eco Fair (2016, 2017, 2018)
- Randwick Spot Festival (2016, 2017, 2018, 2019)
- Coogee Family Fun Day (2016, 2017, 2018, 2019)
- Bondi Winter Magic Festival (2017, 2018, 2019)
- OzTek Dive Fair (2017, 2018)
- Sydney Boat Show (2017, 2018, 2019)
- Waverton Coal Loader Markets (2019)
- Kirribilli Markets (2019)
- Sutherland Shire Markets (2019)
- La Perouse MEMA (2019)
- Stands at popular community events and locations:
- Bondi Junction Station (2017)



- Bondi to Coogee Walk (10 events through 2016, 2017, 2018, 2019)
- Media activities (audience figures in brackets see www.gordonsbayscubadivingclub.com for full video):
- Channel 9 Sydney News Saturday (260,000)
- Channel 9 Sydney News Sunday (400,000)
- 2 x Daily Telegraph articles (1,998,000)
- 2 x Radio 2UW interviews Greater Sydney (300,000)
- 3 x ABC Radio 702 interview (audience tbc)
- 2 x Weekly Southern Courier (130,000)
- 2 x Wentworth Courier (audience tbc)
- 2 x The Beast Magazine (122,000)
- 1 x Bruce Notley-Smith's Community Newsletter (40,000)



Danny Said, Mayor of Randwick at the Coogee Family Fund Day December 2019

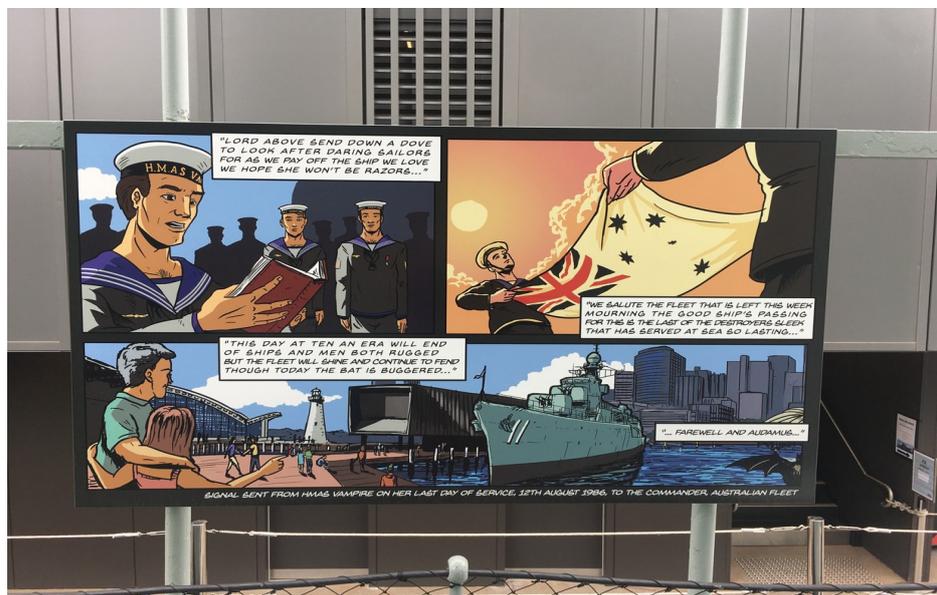
In addition, strong community support for the project is demonstrated in numerous letters of support from marine scientists, members of the dive community, government, and political representatives (Appendix 3).

One member of the ex-HMAS *Darwin* ship's company offered to take our petition to the ships decommissioning ceremony, demonstrating the crew's preference (as also seen on Facebook) for the vessel on which they have served to be scuttled as a dive wreck, rather than scrapped.

However, further support for this view was received from the former commander of the ex-HMAS *Darwin*, Captain Will Martin (2004-2006), in a letter he wrote to the Minister for Defence, Senator Maryse Payne, regarding the future of the ex-HMAS *Adelaide* (Appendix 3):

‘I hope you might be able to steer them (the Capability Acquisition and Sustainment Group) toward a solution that benefits divers, fishermen, scientists, and the economy of NSW.’

Captain Will Martin, former Commander, ex-HMAS *Darwin*



Converting decommissioned ex-Naval vessels to dive wrecks creates far greater value than scrapping for razor blades. This is the preferred option for the woman and men who serve “as we pay off the ship we love we hope she wont be razors”.Signal sent from HMAS Vampire (now at the Australian Maritime Museum) on her last day of service to the Commander Australian Fleet.

Community involvement in this project could also extend to a land-based memorial to the men and women who served in all RAN ships—a tribute that would fit well into the Coogee coastline (John Byrne pers. com. 2017).

3. Analysis of the proposal

3.1 Objectives and indicators

The following outlines what this proposal is seeking to achieve and how each desired outcome will be measured:

Table 3.1.1: *Proposal objectives*

KEY PROBLEM / OPPORTUNITY	KEY PROPOSAL OBJECTIVE	KEY SUCCESS INDICATOR
No dive wreck for Sydney	Acquire a decommissioned Navy ship	NSW Government agrees to fund project
No approved wreck site	Gazette a site under Crown Lands Act 1989 Complete an Environmental Impact Statement (EIS)	Site gazetted EIS completed
Prepare the ship	Preparation in accordance with the London Protocol	Ship ready for sinking
Sink the ship	At site in accordance with Sec 4.2	Ship successfully sunk
Create the OAR	Enhance fishing	Increase catch

3.2 The base case

The base case – the state of the world without the proposal – means not taking up the following opportunities and benefits:

- A world class, challenging, exciting, and sustainable dive experience for divers with varying interests and levels of experience.
- A safe dive wreck for Sydney
- Access for non-divers and divers to the Sydney dive wreck for commercial operators, non-commercial interests, educational establishments, researchers and the public—both on- and off-site.
- An artificial reef linked to a natural reef that provides habitat and protection for a range of species naturally occurring within the dive site. And creating additional recreational and commercial fishing opportunities.

- A land-based monument to respect the history and heritage of the Royal Australian navy ships and all who serve and have served in them.
- Enhanced tourism and increased revenue and employment opportunities for the citizens of NSW
- National and international recognition for the site as a demonstration of the productive and sustainable use of an ex-Navy ship—both as a dive site, with a fishing closure and as an O.A.R with no fishing closure that will contribute to marine environmental awareness. Also, creating additional recreational and commercial fishing opportunities by linking the dive site via an O.A.R to Wedding Cake Island.

There will be no dive wreck without this proposal; hence, there is no case for ‘no change’ or ‘business as usual’.

3.3 The preferred solution

In summary, the proposed dive wreck would:

- function as a new habitat for a multitude of fish and invertebrate species
- create effective marine habitats on what is otherwise a soft-bottomed, featureless environment (Appendix 5)
- alter the connectivity patterns between natural reefs in a positive way creating additional recreational and commercial fishing opportunities.
- provide corridors so smaller fish can safely move from one reef to another

Section 2.2 of this document: Rationale for investment provides further detail in support of this point.

Alternative options

Option 1: Do nothing

- With considerable public support (13,500+ signatures, 3500+ on line petitions 1700+ likes on Facebook) the option to ‘do nothing’ is not an attractive one, as the community has shown it wants the project to proceed.

- Allowing an ex-Navy ship to be allocated to another state would mean a complete loss of the amenity for NSW.

Option 2: Do the minimum

The minimum action in this case would be to allocate funds for an EIS

Option 3: Do later

This is a possible scenario, given the status of ex-HMAS *Darwin*.

3.4 Information about this proposal

The NSW Government has previously delivered a very similar project—the preparation, scuttling and ongoing management of the ex-HMAS *Adelaide* near Avoca Beach on the NSW Central Coast.

We recommend that the scope of works used for the management of that project during delivery and operations should be replicated for the Sydney Dive Wreck project, with the following modifications:

- Adjustments to the works model that may have been recommended from any project reviews conducted on the ex-HMAS *Adelaide* project.
- Adjustments to the scope of works model to include an interface with the Sydney Dive Wreck Organising Committee (SDWOC), which will be available in an advisory/consulting capacity for matters specific to the Sydney region.
- Inclusion of the NSW MP for Coogee on the Steering Committee
- Consideration given to the installation of web cameras on the Sydney Dive Wreck, and the creation of a marine display in the Coogee locality
- Consideration given to the creation of a land-based memorial in Coogee for people who have served on RAN ships.

(Refer to **Appendix 6**, which outlines some of the scope of works detailed for the ex-HMAS *Adelaide*).

Proposal exclusions

There are no specific exclusions in this proposal.

Related projects

As outlined above, the project to scuttle the ex-HMAS *Adelaide* as a dive wreck by the NSW Government off Avoca Beach in 2011 is a very similar project.

3.5 Projected costs

We recommend that the capital costs incurred for the management of the ex-HMAS *Adelaide* project during delivery and operations should be replicated for the Sydney Dive Wreck project, with the following modifications:

- Adjustments to the capital costs that may have been recommended from any project reviews conducted on the ex-HMAS *Adelaide* project.
- Adjustments to the capital costs to include an interface to the SDWOC, which will be available in an advisory/consulting capacity for matters specific to the Sydney region.
- Inclusion of the NSW MP for Coogee on the Steering Committee
- Quotations have been requested from potential firms.

We also recommend that the ongoing costs incurred for the management of the ex-HMAS *Adelaide* project, post-sinking, be replicated for the Sydney Dive Wreck project, with the following modifications:

- Adjustments to the ongoing costs that may have been recommended from any project reviews conducted on the ex-HMAS *Adelaide* project.
- Adjustments to the ongoing costs to include an interface to the SDWOC, which will be available in an advisory/consulting capacity for matters specific to the Sydney region.
- Annual maintenance costs for buoys and signage at the dive site are not expected to be significant, perhaps near \$1,500.00 per annum (Maura Bedloe Communications, 2016).

It is expected that revenue collected from dive permits will easily cover ongoing maintenance costs.

3.6 Cost benefit analysis

This proposal forecasts revenue over five years of between \$12.4m (low) and \$48.6m (high) at a one-off cost of between \$6m and \$10m—a cost benefit ratio of between 2.1 and 4.8 (Appendix 1).

3.7 Financial appraisal

We would recommend that the financial appraisal used for the ex-HMAS *Adelaide* project during delivery and operations should be replicated for the Sydney Dive Wreck project, with the following modifications:

- Adjustments to the financial appraisal that may have been recommended from any project reviews conducted on the ex-HMAS *Adelaide* project
- Adjustments to the financial appraisal to include an interface with the SDWOC, which will be available in an advisory/consulting capacity for matters specific to the Sydney region
- Inclusion of the NSW MP for Coogee on the Steering Committee

This proposal overcomes the costly exercise of disposing of an obsolete navy ship. Other options for the disposal of decommissioned navy ships could include target practice for the Defence Forces, scrapping for metal, maritime museum pieces and backpacker accommodation (Defence 2013). The value achieved by these one-off options does not compare with the lifelong revenue generated when an ex-navy vessel is sunk as a dive wreck. The creation of an O.A.R linking the dive site with Wedding Cake Island will enhance recreational and fishing opportunities.

3.8 Proposed funding arrangements

Table 3.8: *Proposed capital funding contributions (\$000s)*

STAGE	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	REMAINING YEARS	TOTAL
Proposal capital costs							
FUNDING SOURCES							
NSW Government (Subject of this request)	\$10m						
Industry contributions	\$0						
Community contributions	1,000 hours						
Other Government contributions	\$0						
Other funding sources	\$0						
SUB-TOTAL	\$10m						

3.9 Financial health and support

There is no financial support for this project from non-government parties. The project is based entirely on funding from the NSW Government.

4. Implementation case

4.1 Program and milestones

We recommend that the program and milestones that were used for the management of the ex-HMAS *Adelaide* project during delivery and operations should be replicated on the Sydney Dive Wreck project, with the following modifications:

Adjustments to the program and milestones that may have been recommended from any project reviews conducted on the ex-HMAS *Adelaide* project.

4.2 Governance

We recommend that the governance plan incurred for the management of the ex-HMAS *Adelaide* project during delivery and operations should be replicated for the Sydney Dive Wreck project, with the following modifications:

- Adjustments to the governance that may have been recommended from any project reviews conducted on the ex-HMAS *Adelaide* project
- Adjustments to the governance to include an interface to the SDWOC, which will be available in an advisory/consulting capacity for matters specific to the Sydney region
- Inclusion of the NSW MP for Coogee on the Steering Committee.

Some specific points relating to the key personnel and organisational responsibilities, which we expect to be included in the governance model, include:

- Key sponsor/decision maker: Minister for Planning
- Steering Committee Chair: Minister for Planning
- Steering Committee Members:

- Departmental Head of NSW Planning
- Representative from the NSW Department of the Environment
- Representative from the NSW Department of Tourism
- Project Manager appointed by Department of Planning.
- Project Management Office representative
- MP for Coogee
- Representative(s) from Sydney Dive Wreck Organizing Committee
- Representative from National Parks NSW
- Representative from key subcontractor responsible for scuttling preparation (by invitation)

We can provide additional details on any of these areas if required however, as has been previously stated, as the NSW Government has already delivered a very similar project to this proposed project, we expect the governance model to be well established and understood.

4.3 Key risks

We recommend that any key risks that were identified in the management of the ex-HMAS *Adelaide* project during delivery and operations should be replicated on the Sydney Dive Wreck project, with the following modifications:

- Adjustments to any key risks that may have been recommended from any project reviews conducted on the ex-HMAS *Adelaide* project.
- Adjustments to any key risks to include an interface to the SDWOC, which will be available to act in an advisory/consulting capacity for matters specific to the Sydney region.
- Inclusion of the NSW MP for Coogee on the Steering Committee

The NSW Government commissioned Nation Partners (Wedgwood & Speechley 2016) to conduct a risk assessment of the ex-HMAS *Sydney* and ex-HMAS *Tobruk* as dive wrecks. It is not clear if this document can be made public, but it has been provided to the GBSDC by Crown Lands (with the legal risks redacted).

The key risks of this proposed project were responded to at a meeting between the Minister for Primary Industry, Niall Blair, and representatives of the GBSDC. The meeting, which was arranged by the Member for Coogee Mr. Bruce Notley-Smith, was held at Parliament House on 16th November 2016.

The risk-related issues raised by the Department of Primary Industries (DPI) at this meeting (in italics) and the response provided by the GBSDC are summarised below:

Service delivery

No detailed planning has been undertaken, and significant uncertainty exists across the project lifecycle. Based on the experience with the Ex-HMAS Adelaide and other dive wrecks, the market for this technically demanding sport is small and largely confined to Sydney.

The minimum qualification for diving on the ex-HMAS *Adelaide* is Advanced Open Water scuba certification. In PADI diver education terms, technical diving involves at least one of the following conditions:

- Diving beyond a depth of 40 meters
- Required stage decompression
- Diving in an overhead environment beyond 40 linear meters
- Accelerated decompression and/or the use of variable gas mixtures during the dive.

None of these conditions applies to our proposal and, accordingly, it is not correct to say that diving on the proposed Sydney wreck site would be ‘technically demanding’. In fact, the dive wreck is targeted at the recreational dive and snorkeling market—which had more than 98,2000 participants in 2015 (Appendix 6). The creation of an O.A.R linking the dive site with Wedding Cake Island will enhance recreational and fishing opportunities.

To date, international and interstate dive tourism has been negligible on the Central Coast.

The market for diving on ex-Navy ships is significant. Worldwide, more than 1,900 vessels have been sunk as artificial reefs. We see a significant difference between attracting interstate and international divers to a location such as Avoca Beach for the ex-HMAS *Adelaide*, and a dive wreck in Sydney waters.

Using a travel cost model, Morgan et al indicate an annual use value of \$A1735 per diver on specific dive trips to the ex-USS *Oriskany*—a dive wreck located in Florida, USA. However, if a second dive wreck was to be introduced to the region, the authors of this study estimate an increase in diver spend to \$A3,700 (Morgan et al. 2009). This is an overall increase in revenue of 114% so the addition of a new dive wreck is only positive for revenue.

The Sydney tourist market is 24 times as large as the Central Coast market. Sydney is a major tourist hub, which attracted more than 31.5 million overnight visitors in 2015. Of these, 2.9 million were international. This compares to only 1.3 million overnights to the Central Coast for the same period, with just 41,000 of those being international. Growth figures from Destination NSW (DNSW) confirm this difference, with Sydney recording over 9% annual growth in visitor expenditure. DNSW has also identified a significant Chinese market. 536,000 Chinese travelers visited NSW in 2015, and one in ten visitors from China went scuba diving during their trip to Australia (UTS: ACIR).

Health and safety

The depth of the water at Coogee may pose increased risk to the safety of divers at the proposed wreck site. The site selection and business case prepared by the proponent of the Coogee proposal is not adequate to substantiate the proposal for a project with an order of cost of some \$10m to Treasury.

The nominated site is only a suggested location for the Sydney Dive Wreck. The location proposed is a perfect site for a dive wreck for scuba divers. However, for a project that would attract significant public scrutiny, the location will need to be subject to a full and comprehensive analysis, similar to that produced by Worley Parsons (2009) for the ex-HMAS *Adelaide*.

We have prepared this business case based on a range of information—using a top-down approach, whereby we have extrapolated data from research studies based on typical revenue generated from dive wrecks worldwide, and from a bottom-up approach, based on statistics from the local Sydney dive industry.

We would also appreciate detailed information on how you arrived at the estimate of \$10m.

In our proposal, we quote a cost range of \$6m to \$10m—with the latter figure provided by the Minister for Defence in 2013.

The minimum figure of \$6m is based on our research. We have been quoted \$4.5m for ship preparation, \$1m for the O.A.R linking with Wedding Cake Island, and an estimate of \$0.5m to meet legal and regulatory requirements.

The approximate cost of converting the ship to scrap is around \$2m (Trent Raines Birdon) with no possibility of earning any revenue. For an additional expenditure of \$4m, the state can acquire a dive wreck that has the potential to endure as a useable dive attraction for over 100 years. And an O.A.R to enhance fishing

The question ignores the environmental, research and recreational values outlined in our proposal and ignore our suggestion to install on-site cameras to relay images of the wreck to non-diving community members, schools, and educational institutions. The proposed development of an artificial reef between Wedding Cake Island and the dive wreck will further enhance diving and fishing opportunities. More importantly, as it will be located outside the fishing closure of the dive wreck, this artificial reef will provide recreational and commercial fishing opportunities similar to the O.A.R program in the NSW Government's O.A.R program (DPI 2019). Research could also

be done on the potential of the dive wreck to reinvigorate the Sydney rock lobster fishery.

Location

The location for the site is ill defined, but appears to be deeper than the Ex-HMAS Adelaide site, which has recorded one fatality.

The nominated site is only a suggested location for the Sydney Dive Wreck. This site has been suggested because it is outside anchoring and telecommunication restrictions and has the perfect sandy sea floor for a dive wreck. It meets the criteria required for scuttling an ex-Navy ship but is subject to an EIS prior to final site and depth selection. We are interested in any other factors related to the nominated site that we should address prior to the EIS. We would also be prepared to support other nearby sites off the Sydney coast, if our nominated site is not satisfactory.

The depth at the proposed site is 35 m—marginally deeper than the Adelaide at 33 m. We would accommodate a shallower depth for the dive wreck, if that was recommended following the EIS. We are unable to comment on the fatality at the ex-HMAS *Adelaide* dive site, other than to refer to press reports that the diver suffered a cardiac arrest, which may or may not have been related to the dive.

Legal and regulatory

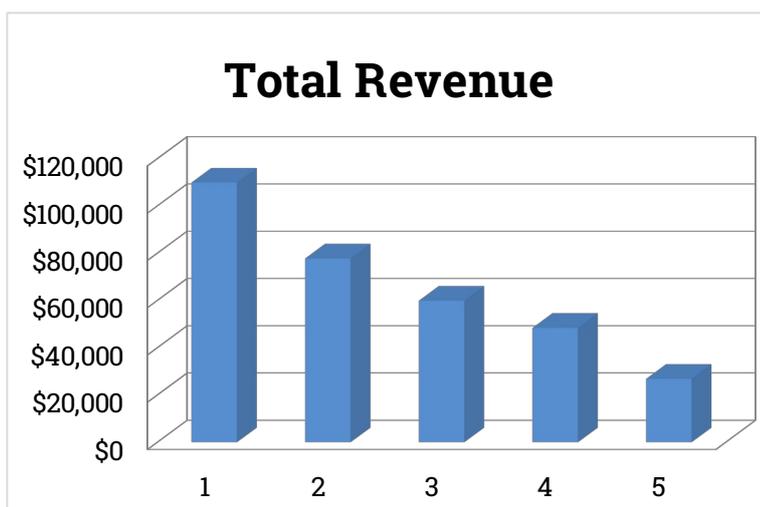
Onerous project regulation and no guarantee of approvals being granted. The deed burdens the NSW Government with all the contractual risk. There are a number of regulatory requirements that need to be met, including: obtaining a Commonwealth Sea Dumping permit, preparation of an Environmental Assessment Development Approval under NSW planning legislation. Experience, and the advice given at the compulsory briefing when the offer to treat was made for ships, suggests that the

assessment instrument would need to be through an Environmental Impact Statement (EIS).

We fully expect that all the processes will be adequately addressed by the relevant areas, and do not see why this is a reason not to proceed to DoD EOI process.

Financial

Significant financial risk due to lack of formal business case. The project may not be financially viable. Given the decline in numbers at the Ex-HMAS Adelaide dive wreck over time, development of a second dive wreck attraction is likely to fragment the limited market and impact on the viability of the existing Adelaide reserve. This would increase the cost burden on the NSW Government and impact on the businesses that depend upon the Adelaide reserve.



This would increase the cost burden on the NSW Government and impact on the businesses that depend upon the Adelaide reserve.

In addressing this question, we refer to previously quoted overseas research regarding the revenue generated by the ex-USS *Oriskany* dive wreck in Florida, USA:

Using a travel cost model, Morgan et al indicate an annual use value of \$A1735 per diver on specific dive trips to the ex-USS *Oriskany*. However, if a second dive wreck was to be introduced, diver spend was estimated to increase to \$A3,700 per diver (Morgan et al. 2009).

There are a number of reasons for the decline in revenue from the ex-HMAS *Adelaide*, including the lack of promotion of the dive site. The DNSW website does not mention scuba diving on the ex-HMAS *Adelaide*, listing only beaches, markets, surfing, and fishing as things to do at Avoca Beach. Additionally, the Sydney tourist market is 24 times as large as the Central Coast market and so potential visitation to the Sydney Dive Wreck site can be assumed larger than that for the ex-HMAS *Adelaide*.

The decline is also related to the ocean conditions for dive boats exiting the sand bar at Tuggerah Lakes and Brisbane Waters, resulting in only a 50% chance of diving. The deeper entrances to Sydney Harbour and Botany Bay provide an 80% chance of diving.

Pro Diving (Groot 2016) states that, based on their records dating back to October 2000, they have been able to conduct scuba diving outside Sydney Heads 80% of the time. This is due to two factors:

- Port Jackson Sydney Heads offers a deep-water exit and entry, which enables safe movement in and out of the Heads for dive boats in all but very rough to extreme sea conditions.
- The water off Sydney—both north and south—is quite deep, which creates far fewer issues with cresting swells and confused sea conditions out at sea. Only three areas along the NSW coast offer these conditions—Port Jackson, Botany Bay and Jervis Bay. The rest of the coastline has shallow exit and entry points and relatively shallow water close to these exit/entry points.

The suggestion (Moltschaniwskyj 2019) that a Sydney Dive Wreck would be subject to the same oceanic conditions leading to the 50% cancellation rate on the ex-HMAS *Adelaide* is contradicted by this industry statement.

Other factors are expected to contribute to more consistent visitation for the Sydney Dive Wreck site. The site offers additional, shallower diving options in the immediate vicinity, including grey nurse sharks at Magic Point, Wedding Cake Island, and Shark Point at Clovelly. Additionally, the Sydney site will be a short trip from many Sydney hotels and other accommodation, making it easier to access than the ex-HMAS

Adelaide, which is over two hours' drive from Sydney to Terrigal. The limited additional attractions in that area have also been a detractor for interstate and international visitors to the ex-HMAS *Adelaide*. Sydney, obviously, would not suffer from the same difficulty.

Adam Crouch, the MP for Terrigal, fully supports the Coogee proposal. In fact, an additional dive wreck in Sydney would assist the flagging revenue on the ex-HMAS *Adelaide*, with dive stores now able to promote two dive wreck destinations—a factor that has been shown to increase diver spend. This fact has been established and referred to earlier in the research by Morgan et al regarding the ex-USS *Oriskany*.

Promotion of the Sydney Dive Wreck to potential visitors is expected to be strong. The SDWOC includes a member from Randwick City Tourism who has already provided promotional support for our campaign and will continue to do so, and the GBSDC Secretary is also a member of the Tourism Committee.

Administrative Appeals Tribunal

The Commonwealth's experience with the preparation of the ex-HMAS Adelaide and the additional preparation cost because of the Administrative Appeals Tribunal (AAT) decision has made them highly risk-averse. It is expected that any exposure to litigation would be borne completely by the state.

The AAT process for the ex-HMAS *Adelaide* may have led to some risk aversion in areas of the Government, but it has positive consequence for a Sydney Dive Wreck and future dive wreck proposals.

The No Ship Action Group (NSAG) in the AAT before the hearing withdrew eleven environmental objections. The NSAG legal action led to the additional preparation costs estimated at \$2.6m. The AAT hearing was granted on the basis that the Minister had approved a sinking date before the sea-dumping permit was approved, not on environmental grounds. This additional level of preparation for a dive wreck is now well understood, and has been included in indicative costing from organisations that may be engaged to perform the preparation for a vessel to be scuttled in Sydney

waters. It is unlikely that any AAT challenge would be made for the Sydney Dive Wreck, given that all concerns raised relating to the ex-HMAS *Adelaide* would be factored into the proposal for the Sydney Dive Wreck. If an AAT challenge is raised, then it would be unlikely to be upheld given the ‘precedent’ of the ex-HMAS *Adelaide* decision. Such a legal challenge, subsequent to the AAT decision on the *Adelaide*, may well be considered vexatious.

Stakeholders

Insufficient community engagement has been undertaken. The potential for the presence of a range of hazardous substances and experience with the ex-HMAS Adelaide project, means that significant local and more widespread opposition to the project would be likely.

A thorough community engagement process has been undertaken for this project (see [Section 2.5 Stakeholder and community support](#))

While a range of potentially hazardous substances are present on all ex-Navy ships prior to disposal, all such hazards are removed prior to sinking. It is disingenuous to say that there are hazardous substances present, and therefore they will remain on the ship. The ex-HMAS *Adelaide* set the benchmark for how to prepare a ship as a dive wreck (Appendix 7). In addition, the quarterly Cardno Ecology Lab reports on the *Adelaide* prove that there are no adverse reactions within the environment from the *Adelaide* ([Appendix 7\(b\)](#)).

Other perceived risks are summarised below:

Dive wreck moving to shore

Concerns have been expressed about the potential for ocean or weather events to cause the wreck to be displaced and move on to the shore at Coogee (Notley-Smith 2013). For example, 120,000 years ago off the coast of Tonga, waves estimated to be

19-44 m in height deposited seven boulders on shore, each weighing between 70 and 1,600 tonnes (Frohlich et al. 2009). This is an unlikely scenario, given the expected wave climate off Coogee and the fact that the dive wreck is three times the weight of the Tongan boulders. Additionally, initial research and informal consultation with environmental engineers makes this concern a most unlikely scenario. Calculations have been done for the ex HMAS *Adelaide* (Worley Parsons 2009), a ship of some 3,800 tonnes. Worley Parsons estimate a slip of two meters for the *Adelaide*, given a maximum wave height at Avoca Beach of 15.6m in 100 years. Prevailing wave conditions off Coogee are similar to Avoca (Short & Woodroffe 2009) and fall generally in the 2-3 m wave height. Waves much higher than that are a rarity (Scheffers & Kelletat 2003).

So, the hypothesis at this stage is that the prospect of the dive wreck ending up on the Coogee shore is most unlikely. If we should have prevailing oceanic conditions capable of moving a 4,000 tonne dive wreck located four kilometers off shore, sunk at a depth of 35 m and emplaced in seven meters of sand, then ship movement would be the least of any problems being experienced on shore.

However, consideration and close attention will need to be given to the assumptions made here with respect to the interaction of the wave climate with the ex-HMAS *Adelaide*, and these would need to be re-evaluated with respect to the proposed site at Coogee. As well as this, any changes to the wave climate at the proposed location compared to the site at Avoca, and any changes to the orientation and depth of the scuttled ship at this location would also need to be considered. It is likely that calculations will show similar results to those for the ex-HMAS *Adelaide* and that the stated hypothesis would be correct. However, for a project that will come under significant public scrutiny, these calculations and a comprehensive analysis of the site proposal would be required (Rowe 2015), similar to that produced by Worley Parsons for the ex-HMAS *Adelaide*.

Heavy metals risk

Potential harmful effects of the dive wreck from lead-based paint and the copper-based anti-fouling system.

As a condition of scuttling, heavy metals monitoring is required for the ex-HMAS *Adelaide*. A site comparison survey for metal contamination was completed by Worley Parsons pre- and post-scuttling (Worley & Parsons 2011). This survey showed sediment values are all below ANZECC/ARMCANZ national guidelines (ANZECC 2000) so there is a very low risk of any adverse environmental effects. In addition, Cardno Ecology Lab conducted a study 21 months after the Worley Parsons survey and concluded that the impact to the marine environment and associated benthic biota as a result of metal corrosion and/or degradation of paint layers from the ex HMAS *Adelaide* is considered unlikely (Lab 2013).

Funds should be allocated for ongoing monitoring of the proposed wreck (Suthers 2015), although these would not be expected at the frequency and cost for the ex-HMAS *Adelaide*, resulting from the Administrative Appeals Tribunal (AAT) order. The fact remains that the *Adelaide* was ready to be sunk in an environmentally sensitive way (Worley & Parsons 2009). The No Ship Action Group (NSAG) obtained a hearing before the AAT, based on the fact that Minister Peter Garrett had signed off on a sinking date before he had signed off on the Sea Dumping Permit for the dive wreck, not on the basis of the NSAG arguments that the process was environmentally unsustainable (AAT 2010).

‘Junk dumping exercise’ – community concerns

Table 1 summarises other impacts of the dive wreck. Community concerns, such as the proposal being a ‘junk dumping exercise’ (as suggested by *The Beast* (Rowe 2013) article) arose from a lack of accurate information about the proposal. Following the publication of this article, five positive responses were received from readers, and no negative comments were received.

The perception is that a grubby metal navy ship should not taint the sea. This view was evident in the NSAG opposition to the sinking of the ex-HMAS *Adelaide* off

Avoca Beach. However, the NSAG’s appeal before the AAT has been best summarised by Cole & Abbs, as follows:

See also: Section 2.2.1 Environmental rationale, and Appendix 7(b).

‘NSAG originally had a long list of concerns, principally claiming that the marine environment would be polluted by the scuttling of ex-HMAS *Adelaide* due to leaching into the marine environment of polychlorinated biphenyls (PCBs) and heavy metals. Their Amended Statement of Issues in April 2010 raised ten issues for the Tribunal to review, but on the second day of the hearings in July, NSAG abandoned all but four items, dropping their claims regarding PCBs and most of the heavy metals. The case proceeded principally upon their concerns relating to potential harmful effects from lead-based paint and the copper-based anti-fouling system. NSAG also argued that the proposal was contrary to the international convention known as the London Protocol, arguing that the ship should be recycled for scrap metal.

The Tribunal heard evidence from a number of experts on these issues—Australian and American specialists in vessel preparation, environmental monitoring, and risk assessment. Evidence was also presented on environmental monitoring from other vessels placed as artificial reefs in Australian and American waters.

The NSW Government presented expert evidence that the risks of harm to the environment from PCBs, copper and lead were low or negligible. The type of lead present—lead tetroxide—is particularly inert and insoluble. The State contended that the proposed scuttling was consistent with the London Protocol as it entailed the deliberate placement of the ship for creating an artificial reef that will attract marine life, and hence was a form of reuse.

The Administrative Appeals Tribunal handed down its decision on 15 September 2010, allowing the scuttling of the ex-HMAS *Adelaide* to proceed with some extra conditions relating to the preparation of the ship and environmental monitoring. By this time, the project was delayed six months at a cost of \$1m. The Tribunal concluded that: “...all the information available to us points to a conclusion that there is no risk of harm to human health or the environment’ and “the level of pollutants

now aboard the ship is low, and those that remain are either in very low quantities or inert and unlikely to cause any environmental problem”.

The Tribunal also concluded that the purpose of the scuttling—to create an artificial reef—is recognised by the Environment Protection (Sea Dumping) Act as a proper purpose and that “...there are benefits to the environment from the resulting marine habitats generated, as well as more general benefits to the community”. The parties had 28 days to appeal the Tribunal’s decision in the Federal Court, but neither party appealed.’ (Cole & and Abbs 2011).

4.4 Legislative regulatory issues and approvals

We would recommend that the legislative regulatory issues and approvals incurred for the management of the ex-HMAS *Adelaide* project during delivery and operations be replicated on the Sydney Dive Wreck project, with the following modifications:

- Adjustments to the governance that may have been recommended from any project reviews conducted on the ex-HMAS *Adelaide* project
- Adjustments to the governance to include an interface to the SDWOC, which will be available in an advisory/consulting capacity for matters specific to the Sydney region.
- Inclusion of the NSW MP for Coogee on the Steering Committee

Legislative regulatory issues and approvals are summarised in [Table 4.4.1](#)

Table 4.4.1 *Legislative Regulatory Issues and Approvals*

IMPACT	IMPACT RATING	GOVERNANCE AND COMMENT
Ship	High	Departments of Planning, Primary Industries, Environment, Climate Change Workcover Destination NSW Randwick City Council Other bidders for the ship
Site selection aesthetics and approval	High	Junk your old boats at our beach? Artificial Reef Permit from DEHWA ¹ under the EP (Sea Dumping) Act 1981 ² . 30 m – 35 m depth EP&A Act Part 5 ³ , NSW CPA 1979 ⁴ , SEPP No71 ⁵ Coastal Protection
Commercial fishing	High	Fishing closure: potential contested resource NSW Fisheries Management Act 1994 ⁶ O.A.R link will enhance fishing.
Recreational fishing	High	Fishing closure: potential contested resource NSW Fisheries Management Act 1994 O.A.R link will enhance fishing.
Diving, snorkeling, spearfishing	Low	Complements existing dive sites, spear fishing closure contested resource SW Fisheries Management Act 1994
Sailing and boating	Medium	Contested resource ocean racing and wreck mooring
Marine Protected Areas	Low	The site borders the existing Bronte to Coogee Marine Protected Area NSW Environment Protection and Biodiversity Conservation Act (EPBC) 1999 NSW Threatened Species (TSC) Conservation Act NSW Fisheries Management Act 1994 The proposal meets all the objectives of Marine Estate Management Act 2014 No 72 (Appendix 10)
Historical shipwrecks	Low	No historical wrecks Commonwealth Historic Ship Wrecks Act (1976) NSW Heritage Act (1997)
Mineral and petroleum	Moderate	Previous proposals to sand mine offshore have been rejected
Telecommunication Cables	High	The site is outside the one nautical mile exclusion zone restriction Approval has been given from REACH Submarine cable protection
Anchoring restrictions	High	The site is outside anchoring restrictions NSW Maritime and Sydney Ports Corporation

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(1) Commonwealth Department of the Environment, Water, Heritage, and the Arts

(2) Commonwealth Environment Protection (Sea Dumping) Act 1981

(3) NSW Environmental Planning and Protection Act (1979) Part 5.

(4) NSW Coastal Protection Act 1979

(5) State Environmental Planning Policy No71 Coastal Protection

(6) NSW Fisheries Management Act 1994

4.5 Proposed management activities

Risk management and operations

We would recommend that the risk management plan incurred on the management of the ex-HMAS *Adelaide* project during delivery and operations be replicated on the Sydney Dive Wreck project, with the following modifications:

- Adjustments to the risk management plan that may have been recommended from any project reviews conducted on the ex-HMAS *Adelaide* project
- Adjustments to the risk management to include an interface with the SDWOC, which will be available in an advisory/consulting for matters specific to the Sydney region.
- Inclusion of the NSW MP for Coogee on the Steering Committee.

Asset management and operations

We would recommend that the asset management and operations plan incurred on the management of the ex-HMAS *Adelaide* project during delivery and operations be replicated on the Sydney Dive Wreck project, with the following modifications:

- Adjustments to the asset management and operations that may have been recommended from any project reviews conducted on the ex-HMAS *Adelaide* project.
- Adjustments to the governance to include an interface with the SDWOC, which will be available in an advisory/consulting for matters specific to the

Sydney region. Inclusion of the NSW MP for Coogee on the Steering Committee.

5. Conclusion

The former MP for Coogee, Bruce Notley-Smith, arranged a meeting at Parliament House on 16 November 2016 with the Minister for Primary Industry, Niall Blair. This followed a risk assessment (4.3) by the Department of Industry Lands on the dive wreck proposal. The consultants did not consider our proposal in their risk assessment. Questions raised by the Department of Primary Industries (DPI) as to why the department was not going to submit an expression of interest for the ex-HMAS *Sydney* (IV) was tabled and answered by the proposers (4.3). The Minister requested that the dive wreck proposal be considered in the context of a Sydney Marine Park and the Marine Estate. Consequently, an earlier proposal was tabled with the Marine Estate Management Authority (MEMA) on 31 March 2017 (Community and Stakeholder Engagement Report 2017). The GBSDC asserts that the November proposal is fully aligned with the objectives of the Marine Estate Management Act 2014 No 72 (Appendix 9). The November proposal was submitted to MEMA on 8 December 2017. On the 17th September 2018, officers from the Department of Environment and Heritage responded that the dive wreck proposal was not considered in the MEMA assessment, in spite of the request by Minister Blair for it to be considered in the context of the Sydney Marine Park proposal. Coogee is a perfect site for a dive wreck for scuba divers. However, for a project that would attract significant public scrutiny, this proposal will need to be subject to a full and comprehensive analysis, similar to that produced by Worley Parsons (2009) for the ex-HMAS *Adelaide*.

The ex-HMAS *Adelaide* has set the gold standard for how to prepare, scuttle, and monitor a dive wreck. The proposed linking O.A.R to Wedding Cake Island in the NSW Government's artificial reef program (DPI 2019) will enhance both recreational and commercial fishing. This proposal demonstrates that there is categorically no scientific basis for any objection to the proposal for a dive wreck or link O.A.R in Sydney waters on environmental grounds. This proposal is undeniably positive for the marine environment, divers, fishers, tourism and the economy overall.

6. Appendices

Appendix 1: Five year revenue, costs and surplus

Five year revenue:

REVENUE HIGH EST.	Year	Year 2	Year 3	Year	Year	Total
No of divers	0	16,000	15,200	14,400	13,600	59,200
Dive revenue (\$K)	0	\$3,840	\$3,648	\$3,456	\$3,264	\$14,208
Tourism revenue* (\$K)	0	\$6,962	\$6,614	\$6,266	\$5,918	\$25,762
Total revenue (\$K)	0	\$10,802	\$10,262	\$9,722	\$9,182	\$39,970
REVENUE LOW EST.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
No of divers	0	8,000	6,800	5,600	5,200	25,600
Dive revenue (\$K)	0	\$1,920	\$1,632	\$1,344	\$1,248	\$6,144
Tourism revenue* (\$K)	0	\$1,526	\$1,297	\$1,068	\$992	\$4,885
Total revenue (\$K)	0	\$3,446	\$2,929	\$2,412	\$2,240	\$11,029

*Includes meals, accommodation, transport, car hire, fuel, incidentals.

Five year costs:

COST HIGH EST.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Scuttling costs (\$K)	\$10,000					\$10,000
Maintenance costs (\$K)		\$15	\$15	\$15	\$15	\$60
Total cost (\$K)	\$10,000	\$15	\$15	\$15	\$15	\$10,060
COST LOW EST.	Year 1	Year 2	Year 3	Year 4	Year 5	Total

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Scuttling costs (\$K)	\$6,000					\$6,000
Maintenance costs (\$K)		\$15	\$15	\$15	\$15	\$60
Total cost (\$K)	\$6,000	\$15	\$15	\$15	\$15	\$6,060

Five year surplus:

MOST FAVOURABLE SURPLUS (High revenue, low cost)	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Surplus (\$K)	-\$6,000	\$10,787	\$10,247	\$9,707	\$9,167	\$33,910
LEAST FAVOURABLE SURPLUS (Low revenue, high cost)	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Surplus (\$K)	-\$10,000	\$3,431	\$2,914	\$2,397	\$2,225	\$969

Rather than providing a single specific revenue and cost figure, a range has been provided for each of these cost and revenue elements.

The following factors and planning assumptions have been used to prepare the revenue, cost and surplus tables above.

Revenue:

The main factors influencing the revenue to the NSW government from Sydney Dive Wreck will be the following:

- Number of divers attending the wreck
- The geographic origin of divers (i.e. Sydney, interstate, international). Divers from interstate and international origin bring tourism revenue.
- Spend per diver (diving-specific items and general tourism spend (included meals, accommodation, transport, car hire, fuel, incidentals)
- National park fees
- The time taken to prepare the ship for diving—which determines when revenue commences

The following assumptions were used in preparation of these estimates:

- Number of divers (based on dive industry estimates) Refer to the number in Table above
- Geographic origin (ranging from 44% Sydney divers to 75% Sydney divers)
- Dive industry spend (ranging from \$152–\$222 per diver, per day)
- Tourism spend (ranging from \$450–\$660 per diver, per day)
- National park fee (\$20 per diver, per day)
- A ‘decline rate’ has been factored into the diver numbers (ranging from 5%–15% per year).
- It is assumed that the activities required to prepare the dive wreck for use—from gifting of the vessel to the NSW Government to scuttling and commencement of diving activities—will be completed in 12 months. Revenue will commence in Year 2.

Cost:

As stated in other sections of the document, the best way to calculate the cost of this project is to apply relevant aspects of the costs incurred for preparing the ex-HMAS Adelaide. However, we do not have access to this cost information. As a result, the cost estimates provided are based on a ‘low’ figure of \$6m (based on an informal quote from a contracting organisation that has provided similar services) to a high figure of \$10m (based on advice from a senior Naval official).

Surplus:

Two calculations have been used to calculate a range for the surplus. These are the ‘most favourable’ (highest revenue–lowest cost) and ‘least favourable (lowest revenue–highest cost).

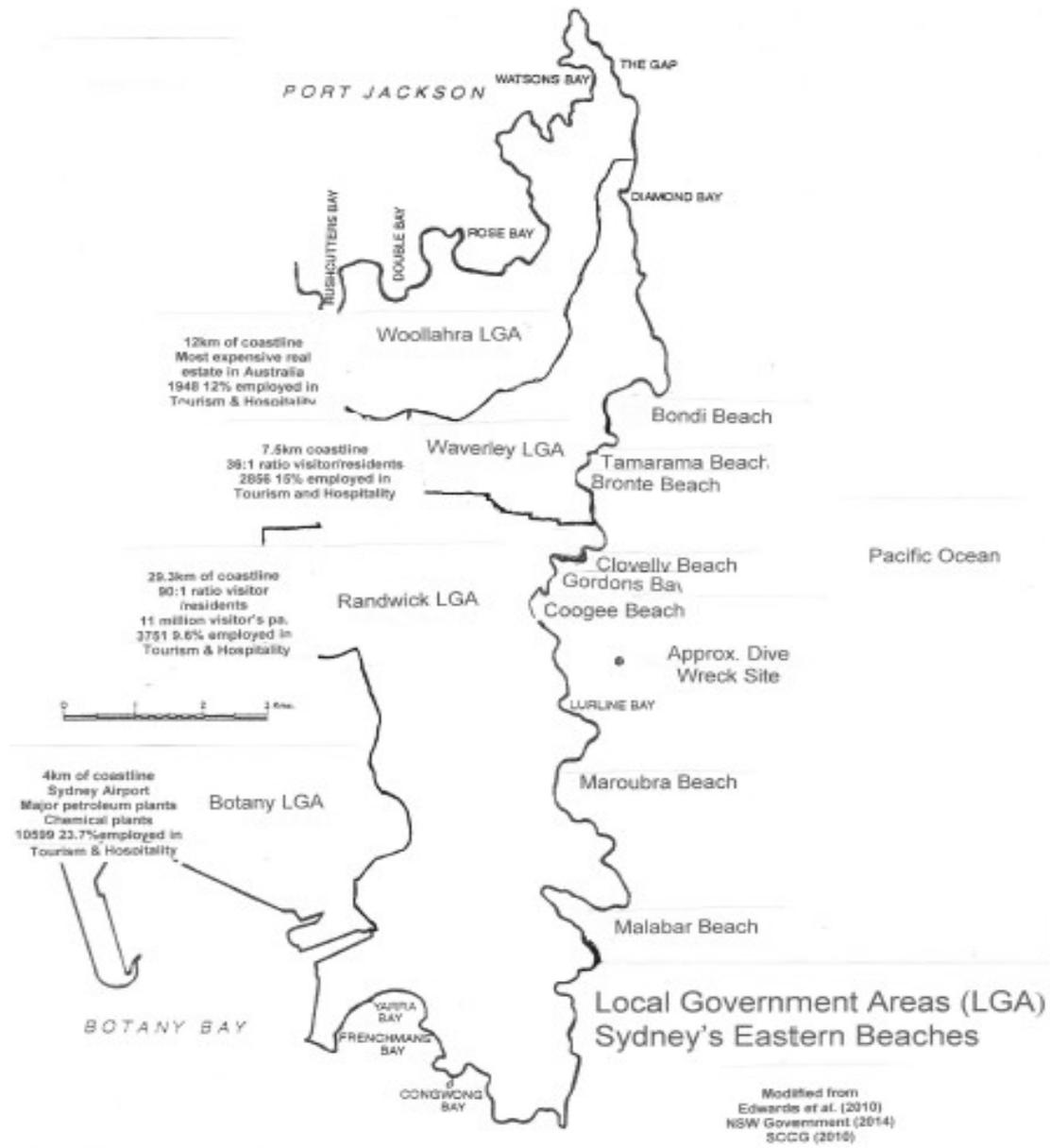
The following references have been used to provide the data for the estimate of revenue, calculated from the best available information from the Australian dive industry and Australian and international studies:

(Tabata 1992, Rhodes et al. 1994, Bell et al. 1998, Dowling & Nichol 2001, Johns et al. 2001, Ditton et al. 2002, County 2004, Pendleton 2004, Adams et al. 2006, Escobedo 2007, Oh et al. 2008, Schaffer et al. 2008, Tapsuwan & Asafu-Adjaye

2008, Wheaton et al. 2008, Morgan et al. 2009, Schaffer & Lawley 2010, Anning 2011, Leeworthy 2011b, Schaffer 2011, Shani et al. 2012, Clark 2014, Beaver 2015, Huth et al. 2015, Choi et al. 2016, Paterson 2016, Wikipedia 2016)

Appendix 2: Local Government Areas (LGA)

Appendix 2a: Local Government Area map



Appendix 2 (b) Total visitors by LGA (year ending September, 2015)

LGA	Thousands							
	Intl	%	Domestic o/night	%	Daytrip	%	total	%
Botany Bay	106	10.5	178	24.7	433	28.2	717.0	39.4
Randwick	812	80.6	226	31.4	520	33.8	827	45.5
Waverley	67	6.6	199	27.6	355	23.1	622	34.2
Woollahra	23	2.3	117	16.3	230	15.0	370	20.3
Total LGA	1,008	100	720	100	1538	100	1,819	100
Total Sydney	2,900	34.8	9,222	7.8	19,341	8.0	31,514	5.8
Total Australia	6,700	15.0	85,320	0.84	174,875	0.88	266,912	0.68

<http://www.tra.gov.au/research/latest-nvs-report.html>

Appendix 3: Letters of support

The following letters of support have been received for the proposal:

LETTER	SUPPORTER
1	Australian National Maritime Museum
2	Shire of Busselton, WA
3	Michael Daley, MP for Maroubra
4	Michael Daley, MP for Maroubra
5	Sen Hon Robert Hill, Minister for Defence
6, 7	Sen Hon Robert Hill, Minister for Defence
8	Peter Garrett, MP Kingsford Smith
9	Pru Goward, MP for Goulburn
10	David Nutley, NSW Heritage Office
11, 12	Sen Hon David Johnston, Minister for Defence
13, 14	Stephen Jones, MP for Throsby
15	Mike Kinley, AMSA
16	Bruce Notley-Smith, MP for Coogee
17	National Parks Association Dinner with NSW Premier Morris Iemma
18–20	NSW Department of Primary Industry
21	NSW Department of Premier and Cabinet
22	Mayor – City of Randwick
23	Sen Hon Maryse Payne, Minister for Defence
24–27	REACH Submarine Cable Protection
28	Peter Steinberg, SIMS Chair
29	Geoff Cook, South Pacific Divers Club
30	Clover Moore, The Lord Mayor of Sydney
31	The Hon George Souris, NSW Minister for Tourism
32	The Hon Andrew Stoner, Minister for Trade and Investment
33	The Hon Sandra Nori, Minister for Tourism
34-35	Tim Fischer, Australian Tourism Commissioner
36-37	Malcolm Turnbull, MP for Wentworth
38	Gabrielle Upton, Member for Vaucluse
39	Stuart Ayres, Minister for Trade Tourism and Major Events
40	Peter Debnam, Member for Vaucluse
41	Marjorie O’Neil, Labor candidate for Coogee
42	Captain Will Martin, Commander ex-HMAS Darwin
43	The Hon Dave Sharma, MP for Wentworth
44	The Hon Matt Thistlethwaite, MP for Kingsford Smith
45	The Hon Melissa Price, Minister for Defence Industry
46	The Hon Felicity Wilson, MP for North Shore

Appendix 4: NSW Recreational dive centres—proximity to proposed Coogee site

Total recreational dive centres in NSW: 47

Recreational dive centres within 75 minutes' drive of proposed Coogee site:

1. Dive, Spear, Sport –1729 Pittwater Rd, Mona Vale NSW 2103
2. Pro Dive Manly – 9 Sydenham Rd, Brookvale NSW 2100
3. Dive Centre Manly – 10 Belgrave St, Manly NSW 2095
4. Southern Cross Divers – 235 Spit Rd, Mosman NSW 2088
5. Dive 2000 – 2 Military Rd, Neutral Bay NSW 2089
6. Frog Dive – Willoughby 539 Willoughby Rd, Willoughby NSW 2068
7. Adreno Scuba Diving – 2/678-682 Botany Rd, Alexandria NSW 2015
8. Pro Dive Coogee – 27 Alfreda St, Coogee NSW 2034
9. Sydney Dive Safari – 1371-1373 Botany Rd, Botany NSW 2019
10. Scubathlon Scuba Diving Centre – 670 Princes Hwy, Kogarah NSW 2217
11. Abyss Scuba Diving – 278 Rocky Point Rd, Ramsgate NSW 2217
12. Obsession Dive – 5/155 Taren Point Rd, Taren Point NSW 2229
13. GEO Divers – 3 Horwood Pl, Parramatta NSW 2150
14. Pro Dive – 40 Kingsway, Cronulla NSW 2210
15. Dive Smart – 1/10 Victoria Ave, Castle Hill NSW 2154
16. Sub Aquatics – 9 Newill St, Condell Park, 2200
17. Wilderness Sea and Ski – 137 George St, Liverpool NSW 2170
18. United Divers – 22 Princes Hwy, Fairy Meadow NSW 2519
19. Windang Dive and Spearfishing – 324/328 Windang Rd, Windang NSW 2528
20. Shellharbour Scuba Centre – 41 Addison St, Shellharbour NSW 2529

Recreational dive centres within 120 minutes' drive of proposed Coogee site

1. Leisure Coast Dive – 2/17 Addison St, Shellharbour NSW 2529
2. Dive Jervis Bay – 64 Owen St, Huskisson NSW 2540
3. Dive Imports Australia – 5/188 The Entrance Rd, Erina NSW 2250
4. Pro Dive Central Coast – 163 Wyong Rd, Killarney Vale NSW 2261

Recreational dive centres within 180 minutes' drive of proposed Coogee site:

1. Charlestown Diving Academy – 53a Ridley St, Charlestown NSW 2290
2. Feet First Dive – 17/34 Stockton St, Nelson Bay NSW 2315
3. Let's Go Adventures Dive Nelson Bay – 8 Teramby Rd, Nelson Bay NSW 2315

Other recreational dive centres in NSW:

1. Dive Adventures Ulladulla – Kings Point Industrial Estate, 6 Aroo Rd, Ulladulla NSW 2539
2. South Coast Underwater Diving Academy – 150 Princes Hwy, Ulladulla NSW 2539
3. Batemans Bay Dive Adventures – 6 Sharon Rd, Batemans Bay NSW 2536
4. Narooma Fishing and Dive Centre – 66 Princes Hwy, Narooma NSW 2546
5. Underwater Safaris – Centenary Dr, Narooma NSW 2546
6. Merimbula Divers Lodge – 1/15 Park St, Merimbula NSW 2548
7. Forster Dive Centre – 11-13 Little St, Forster NSW 2428
8. Dive Forster at Fisherman's Wharf – Cnr Memorial Drive & Little St, Forster 2428
9. Ricks Dive School – 19 Granite St, Port Macquarie NSW 2444
10. SCUBA Haven – 20 Merrigal Rd, Port Macquarie NSW 2444
11. Fish Rock Dive Centre – 134 Gregory St, South West Rocks NSW 2431

12. South West Rocks Dive Centre – 5/98 Gregory St, South West Rocks NSW 2431
13. Jetty Dive Centre – 398 Harbour Dr, Coffs Harbour NSW 2450
14. Riffe Oceania – Woolgoolga NSW 2456
15. Dive Quest – 30 Mullaway Dr, Mullaway NSW 2456
16. Byron Bay Dive Centre – 9 Marvell St, Byron Bay NSW 2481
17. Sundive Byron Bay – 11/8 Middleton St, Byron Bay NSW 2481
18. Blue Bay Divers – Brunswick Heads Boat Harbour, Old Pacific Highway, Brunswick Heads NSW 2483
19. Tweed Sea Sports – 33 Machinery Dr, Tweed Heads South NSW 2486
20. Kirra Dive on the Tweed – 1/133 Wharf St, Tweed Heads NSW 2485

Appendix 5: Coogee wreck dive site characteristics

The proposed site at Coogee is considered a suitable location as it meets all of the following desirable characteristics for a dive wreck site:

- A bare sandy bottom without extreme conditions, such as strong rips or currents.
- Appropriate depth to the seabed and underlying rock to ensure the scuttled vessel can penetrate into the sand and remain stable and upright
- Geological characteristics suitable for the ship to settle with no impact on local reefs and other geological features
- An appropriate depth of water for diving (water depths in the area of the Coogee site are between 30m and 34m)
- Safe for scuba diving, with good visibility
- Reasonable proximity to on-shore infrastructure for dive operators
- The ability to attract marine life to colonise the artificial reef
- Capacity to attract fish, and increase local biodiversity
- No sensitive marine habitats
- No natural reef or seagrass beds
- Meets navigational safety requirements
- Minimal impact on commercial fisheries
- Minimal impact on the local coastline
- No impact on shipping lanes or navigational areas
- No impact on other legitimate uses that may operate in the area



Appendix 6: Sport participation table Australia (Source: Roy Morgan Research)

ACTIVITY	TOTAL PLAYERS 000	% WOMEN	% MEN
Swimming	6,853	56	44
Hiking / bushwalking	5,041	52	48
Jogging	4,576	49	51
Gym /weight training	4,223	49	57
Cycling	3,656	43	57
Ten pin bowling	2,007	50	50
Yoga	2,002	78	22
Golf	1,891	19	81
Tennis	1,682	41	59
Soccer	1,400	27	73
Aerobics	1,208	80	20
Cricket	1,205	11	89
Basketball	1,055	24	76
Diving/snorkeling	982	47	53
Marathon running	719	51	49
Netball	678	85	15
AFL	583	19	81
Shooting	518	17	83
Horse riding	514	66	34
Boxing	513	54	46
Volleyball	461	44	56
Rock climbing	400	47	53
Rowing	342	46	54
Rugby league	320	22	78

Appendix 7: Ex-HMAS *Adelaide* scuttling

Appendix 7(a) Ex-HMAS *Adelaide* background and scuttling process

Locations	Glebe Island Wharf No. 2, Sydney Harbour NSW
Client	NSW Land and Property Management Authority
Contract	Scuttling of ex-HMAS <i>Adelaide</i> vessel for use as an artificial reef
Cost	\$6.5 million
Duration	18 months, 2011

The Australian Navy ship ex-HMAS *Adelaide* participated in the 1990/91 Gulf War, peacekeeping operations in East Timor in 1999, and was also deployed to the Arabian Gulf as part of the International Coalition against Terrorism in 2001 and 2004. She was Australia's first guided-missile frigate and was home-ported in Western Australia.

McMahon Services were contracted by the NSW Land and Property Management Authority to prepare the vessel for scuttling off the NSW mid-coast. This was an enormous task—stripping a fully operational war ship to make it a virtual skeleton. All environmental hazards required total removal.

The contractor was required to develop methods to make the vessel do what it was never design to do...sink. The vessel was littered with specially cut holes to let water in and air out when it was scuttled. The main task was to penetrate bulkheads and clearing pathways through the vessel so that divers had enough room to manoeuvre through safe thoroughfares.

Key milestones

Milestone 1: Establishment and vessel delivery

Milestone 2: Initial preparation and towage

Milestone 3: Design and ship preparation

Milestone 4: Scuttling

Milestone 5: Post-scuttling activities

Milestone 6: Handover, including ballasting details and Dangerous Goods and Materials Register

Unique processes

- Removal of zinc chromate and lead-based paint prior to hot work or friction cutting
- Removal of 80 tonnes of lead ballast ‘pigs’ sealed inside the ballast tanks and in the auxiliary motor room bilges, attached to the keel between the ribs and stringers.
- The client and end user groups, including the dive community and environmental groups, were very pleased with the dive design and the considerable items of interest that were retained in the vessel, from the bridge to the engine rooms.
- Environmental groups were impressed with the standard of clean lines, particularly the removal of the hydrocarbons, insulation and dangerous materials.
- The project took approximately 18 months and 30,000+ hours to complete, with a steady crew of 20 personnel.

Materials removed

- 80 tonnes of lead ballast
- Hydrocarbons – 145,000 litres of hydraulic oil lube oil, JP5 aviation fuel, diesel/oily bilge water, mercury switches in fire system (143 in total – sent to licenced recycler)
- Capacitors from 1,000+ fluorescent lights, potentially containing PCBs (2000)

- 2,000 fluorescent tubes containing mercury gases – removed and sent to licenced recycler
- 50 transformers containing potential PCBs
- 4,800 light globes from instrument panels, battle lamps, landing lights, etc.
- 5,100 fuses from electrical boards, communication boards, radars, instrument panels
- 450 various capacitors in electrical boxes and communication appliances
- Approximately 600 9V batteries from battle lamps
- Asbestos – including ducting, pipe flanges, and switchboards. Safely removed and disposed of via a icensed contractor



Scuttling the ex-HMAS Adelaide

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Links to video of ex-HMAS Adelaide

<http://www.mcmservices.com.au/media/videos/the-force-hmas-adelaide/the-force-hmas-adelaide>

<http://www.mcmservices.com.au/media/videos/hmas-adelaide-decommissioning-and-scuttling/hmas-adelaide-decommissioning-and-scuttling>

<http://www.mcmservices.com.au/news/the-final-journey-of-the-ex-hmas-adelaide>

<http://www.mcmservices.com.au/news/ex-hmas-adelaide-sent-to-a-watery-grave>

Appendix 8: Dive wrecks worldwide

For a full list of 1,906 vessels sunk between 1942–2016 worldwide as artificial reefs, see (Ilieva et al. 2019). **Sinking ships for wreck diving sites:**

YEAR	VESSEL	LOCATION	COUNTRY / TERRITORY
2018	HMAS <i>Tobruk</i>	Bundaberg QLD	Australia
2017	<i>Gal 'Oz</i> fishing trawler	Hertzliya, Israel	Israel
2017	USCGC <i>Tamaroa</i> (WMEC-166)	Cape May, New Jersey	United States
2016	Vis	Kamenjak, Istra	Croatia
2016	Airbus	Kusdaci	Turkey
2016	Ship	Karaburun	Turkey
2016	Ship	Dikili	Turkey
2016	Ship	Karaburum	Turkey
2015	Ship	Merselin Silifske	Turkey
2015	ARM <i>Uribe</i> (P121)	Rosarito Beach	Mexico
2015	USS <i>Comstock</i>	Checheng Township Pingtung	Taiwan
2015	HMCS <i>Annapolis</i>	British Columbia	Canada
2014	Ship	Erdine Sarus Bay	Turkey
2014	MV <i>Ærø Sund</i>	South Fionan Sea	Denmark
2014	HTMS <i>Kledkaeo</i> (AKS-861)	Phi Phi Islands	Thailand
2013	Tug No. 2	Sliema	Malta
2013	Airplane C47	Kemer Ucadalar	Turkey
2013	T11 coastal patrol ship	Ko Chang	Thailand
2013	NRP <i>Almeida Carvalho</i> (A527)	Algarve	Portugal
2013	NRP <i>Hermenegildo Capelo</i> (F481)	Algarve	Portugal
2012	Ship	Samsun Kurupelit	Turkey
2012	USS <i>Lincoln County</i>	Ko Chang	Thailand
2012	NRP <i>Zambeze</i> (P1147)	Algarve	Portugal
2012	NRP <i>Oliveira e Carmo</i> (F489)	Algarve	Portugal

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YEAR	VESSEL	LOCATION	COUNTRY / TERRITORY
2012	HTMS <i>Phetra</i> (LCT-764)	Ko Man Nok	Thailand
2012	HTMS <i>Mataphon</i> (LCT-761)	Ko Larn	Thailand
2012	USCGC <i>Mohawk</i>	Lee County, Florida	United States
2011	USS <i>Arthur W. Radford</i>	Cape May, New Jersey	United States
2011	HTMS <i>Sattakut</i> (LCI-742)	Koh Tao	Thailand
2011	HTMS <i>Prab</i> (LCI-741)	Chumphon	Thailand
2011	HMAS <i>Adelaide</i>	Avoca Beach, NSW	Australia
2011	USS <i>Kittiwake</i> (ASR-13)	Grand Cayman	Cayman Islands
2011	Ship	Didim	Turkey
2011	Ship	Kas, Cukurbag Peninsula	Turkey
2011	Ship	Airplane	Turkey
2010	Ship	Seferihisar Sigacik	Turkey
2009	P31	Comino	Malta
2009	Airplane	Kaz Incebogaz	Turkey
2009	Ship	Duzce	Turkey
2009	HMAS <i>Canberra</i>	Barwon Heads VIC	Australia
2009	USNS <i>Vandenberg</i>	Key West, Florida	United States
2008	Airplane C47	Bodrum, Pacoz Bright	Turkey
2007	USS <i>Cruise</i>	Delaware Bay	United States
2007	Ship	Kemer Ucadalar	Turkey
2007	Ship	Bodrum Karaada	Turkey
2007	HMNZS <i>Canterbury</i>	Bay of Islands	New Zealand
2007	USTS <i>Texas Clipper</i>	South Padre Island, Texas	United States
2007	P29	Ċirkewwa	Malta
2006	Ship	Alanya Damlatas Beach	Turkey
2006	MV <i>Cominoland</i>	Gozo	Malta
2006	MV <i>Karwela</i>	Gozo	Malta
2006	HTMS <i>Kut</i> (L-731)	Pattaya	Thailand
2006	USS <i>Oriskany</i> (CV-34)	Florida	United States
2006	Xihwu Boeing 737	British Columbia	Canada
2005	HMNZS <i>Wellington</i>	Wellington	New Zealand

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YEAR	VESSEL	LOCATION	COUNTRY / TERRITORY
2005	<i>HMAS Brisbane</i>	Mooloolaba, QLD	Australia
2004	<i>Hebat Allah</i>	Hurghada, Red Sea	Egypt
2004	<i>USCGC Spar</i>	Morehead City, NC	United States
2004	<i>HMS Scylla</i>	Whitsand Bay, Cornwall	United Kingdom
2003	<i>MV Camia 2</i>	Boracay Island	Aklan
2003	<i>CS Charles L Brown</i>	Sint Eustatius	Leeward Islands
2003	<i>HMCS Nipigon</i>	Quebec	Canada
2003	<i>USS Leonard F. Mason</i>	Chaikou, Green Island	Taiwan
2003	<i>HTMS Khram (L-732)</i>	Ko Phai	Thailand
2002	<i>MV Dania</i>	Mombasa	Kenya
2002	<i>USS Spiegel Grove</i>	Florida	United States
2002	<i>HMAS Hobart</i>	Yankalilla Bay, SAa	Australia
2001	<i>HMAS Perth</i>	Albany, WA	Australia
2001	<i>HMCS Cape Breton</i>	British Columbia	Canada
2001	<i>USS Jubilent</i>	Veracruz	Mexico
2000	<i>HMNZS Waikato</i>	Tutukaka	New Zealand
2000	<i>USS Knave</i>	Puerto Morales	Mexico
2000	<i>USS Fort Marion</i>	HaiTzuKuo, Xiaoliuqi	Taiwan
2000	<i>HMCS Yukon</i>	San Diego, California	United States
2000	<i>Stanegarh</i>	Stoney Cove	United Kingdom
1999	<i>MV Imperial Eagle</i>	Qawra	Malta
1999	<i>USS Scuffle</i>	Cozumel	Mexico
1999	<i>HMNZS Tui</i>	Tutukaka Heads	New Zealand
1999	<i>MV Xlendi</i>	Gozo	Malta
1998	<i>MV Adolphus Busch</i>	Looe Key, Florida	United States
1998	<i>Um El Faroud</i>	Qrendi	Malta
1998	<i>St. Michael</i>	Marsaskala	Malta
1998	<i>Tug No. 10</i>	Marsaskala	Malta
1997	<i>HMCS Saskatchewan</i>	British Columbia	Canada
1997	<i>HMAS Swan</i>	Dunsborough, WA	Australia
1996	<i>HMCS Columbia</i>	British Columbia	Canada
1996	<i>MV Captain Keith Tibbetts</i>	Cayman Brac	Cayman Islands

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YEAR	VESSEL	LOCATION	COUNTRY / TERRITORY
	(formerly Russian-built frigate 356)		
1996	Inganess Bay		British Virgin Islands
1995	HMCS <i>Mackenzie</i>	British Columbia	Canada
1995	MV <i>Jean Escutia</i>	Puerto Morelos	Mexico
1994	INS <i>Sufa</i>	Eilat, Israel	Israel
1994	HMAS <i>Derwent</i>	Rottneest Island	Australia
1994	HMS <i>Pelorus</i>	Miller's Point,	South Africa
1994	HMCS <i>Saguenay</i>	Nova Scotia	Canada
1992	HMCS <i>Chaudière</i>	British Columbia	Canada
1992	USS <i>Indra</i>	North Carolina	United States
1992	MV <i>Rozi</i>	Ċirkewwa	Malta
1991	USS <i>Algol</i>	New Jersey	United States
1991–2001	Wreck Alley – <i>Marie L, Pat and Beata</i>		British Virgin Islands
1991	MV <i>G.B. Church</i>	British Columbia	Canada
1990	<i>Fontao</i>	Durban	South Africa
1990	USCG <i>Hollyhock</i>	Florida	United States
1990	T-Barge	Durban	South Africa
1990	USS <i>Chippewa</i>	Destin, Florida	United States
1990	USS <i>Yancey</i>	Morehead City, North Carolina	United States
19891	Trolley Bus	Izmir inner Bay	Turkey1
1989	YO-257	Oahu, Hawaii	United States
1989	USS <i>Blenny</i>	Ocean City, Maryland	United States
1989	USS <i>Muliphen</i>	Port St. Lucie, Florida	United States
1988	USS <i>Aeolus</i>	North Carolina	United States
1988	USS <i>Rankin</i>	Stuart, Florida	United States
1988	USCGC <i>Unimak</i>	Virginia	United States
1988	USS <i>Vermilion</i>	Myrtle Beach, South Carolina	United States
1987–2000	Wreck Alley	San Diego, California	United States
1987	USCGC <i>Bibb</i>	Florida	United States

— SYDNEY DIVE WRECK BUSINESS CASE | GORDONS BAY SCUBA DIVING CLUB —

YEAR	VESSEL	LOCATION	COUNTRY / TERRITORY
1987	USCGC <i>Duane</i>	Florida	United States
1987	<i>Rainbow Warrior</i>	Matauri Bay	New Zealand
1987	USS <i>Strength</i>	Panama City, Florida	United States
1987	USS <i>Accokeek</i>	Gulf of Mexico	United States
1985	<i>Eagle</i>	Florida	United States
1983	USS <i>Curb</i>	Key West, Florida	United States
1982	MS <i>Logna</i>	Grand Bahama Island	Bahamas
1982	USS <i>Scrimmage</i>	Waianae, Hawaii	United States
1980	USS <i>Mindanao</i>	Daytona Beach, Florida	United States
1980	USS <i>Harlequin</i>	Isla Mujeres	Mexico
1980	<i>Oro Verde</i>		Cayman Islands
1978	USS <i>Dionysus</i>	North Carolina	United States
1975	USS <i>Mona Island</i>	Wachapreague, Virginia	United States
1974	SS <i>Theodore Parker</i>	North Carolina	United States
1972	USS <i>Fred T. Berry</i>	Key West, Florida	United States
1970	<i>Mohawk</i>	Wrightsville Beach, North Carolina	United States
1970	<i>Glen Strathallen</i>	Plymouth Sound	United Kingdom
1968	USS <i>Mizpah</i>	Palm Beach, Florida	United States
1942/1984	ITS <i>Scirè</i>	Haifa, Israel	Israel

Appendix 9: Sydney Dive Wreck alignment with the Marine Estate Management Act (MEMA) No 72, 2014

MEMA OBJECTIVES	SDW REFERENCE	MET
(a) to provide for the management of the marine estate of New South Wales consistent with the principles of ecologically sustainable development in a manner that:	Overall	Yes
Promotes a biologically diverse, healthy and productive marine estate	Section 2.2.1 Environmental rationale	Yes
Facilitates economic opportunities for the people of New South Wales, including opportunities for regional communities	Section 2.2.2 Economic rationale	Yes
Facilitates the cultural, social and recreational use of the marine estate	Section 2.2.4 Community rationale	Yes
Facilitates the maintenance of ecosystem integrity	Section 2.2.1 Environmental values	Yes
Facilitates the use of the marine estate for scientific research and education	Section 2.2.3 Research values	Yes
Promotes the co-ordination of the exercise , by public authorities, of functions in relation to the marine estate	Section 4.2. Governance	Yes
Provides for the declaration and management of a comprehensive system of marine parks and aquatic reserves	Executive summary	Yes

APPENDIX 10 NSW Electoral divisions

Appendix 10 (a) NSW Electoral divisions – petition analysis (highest to lowest signatures)

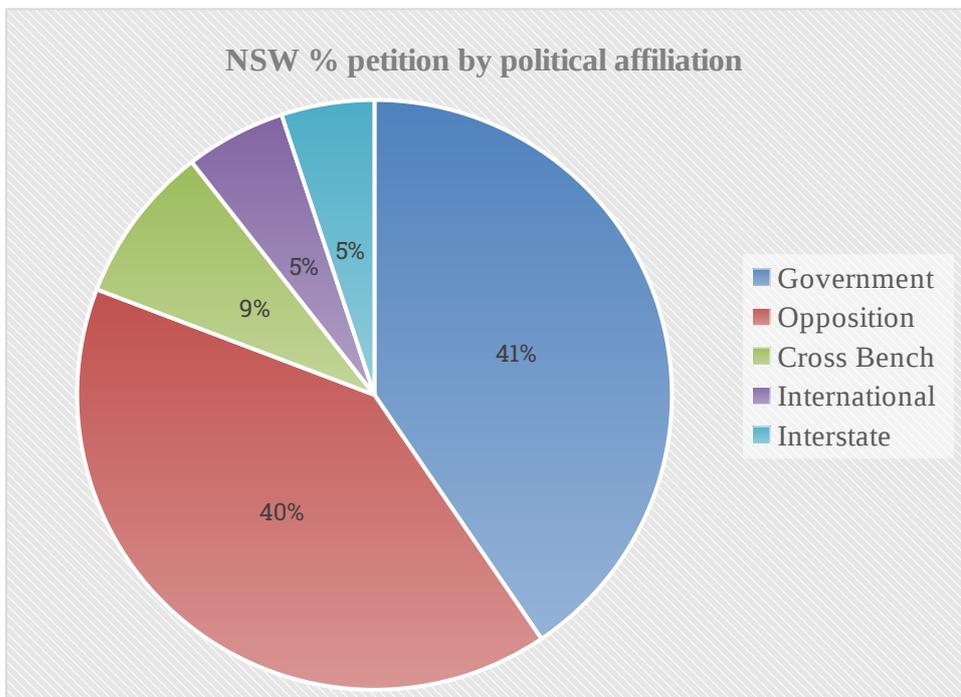
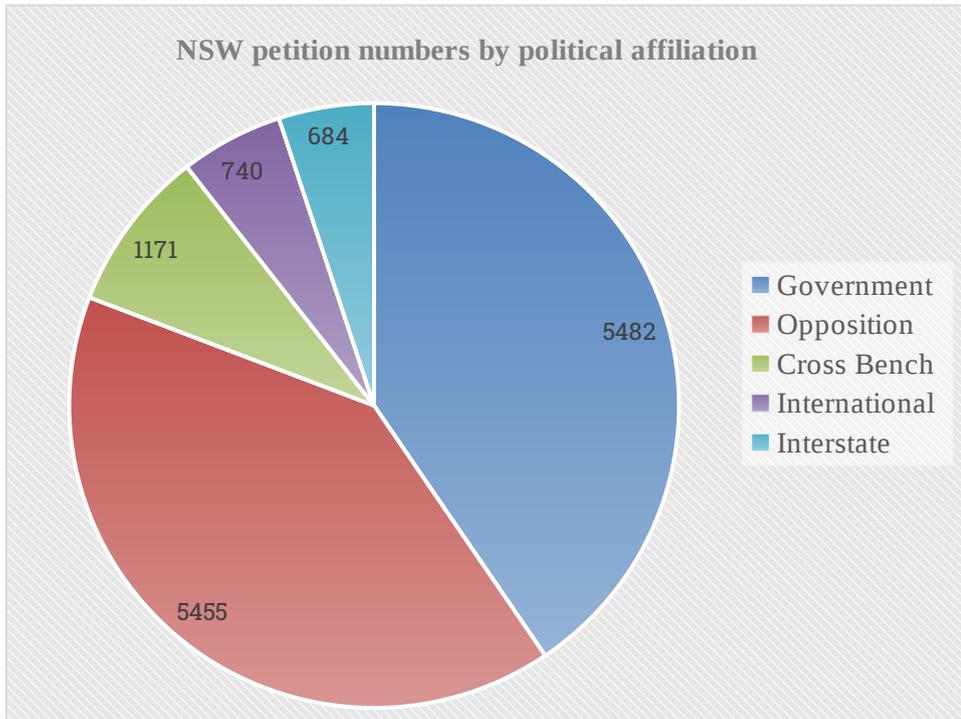
The following table shows the petition support for a dive wreck in Sydney waters as at November 2019. More than 10% of signatories are interstate and international.

<100 PEITIONERS		100 PETITIONERS		100 PETITIONERS		100 PETITIONERS	
Coogee	2,586	Baulkham Hills	92	Blue Mountains	39	Clarence	18
Maroubra	1,248	Oatley	87	Mulgoa	39	Liverpool	18
Manly	904	Kuringai	84	Wollongong	39	Prospect	18
International	740	Goulburn	78	Cessnock	36	Monaro	17
Willoughby	727	Castle Hill	74	Miranda	36	Nth Tablelands	14
Sydney	712	Parramatta	71	Bathurst	34	Orange	14
Interstate	684	Canterbury	71	Shell Harbour	34	Wollondilly	14
Wakehurst	578	Hawkesbury	70	Cabramatta	33	Swansea	11
Vaucluse	436	Lake Macquarie	66	Riverstone	33	Ballina	10
Pittwater	411	Camden	65	Newcastle	31	Maitland	10
Heffron	336	Davidson	65	Terrigal	31	South Coast	10
Lane Cove	232	Strathfield	65	Fairfield	27	Tamworth	9
Balmain	190	East Hills	64	Port Stephens	27	Myall Lakes	8

SYDNEY DIVE WRECK BUSINESS CASE | GORDONS BAY SCUBA DIVING CLUB

Cronulla	188	Charlestown	62	Bankstown	25	Wallsend	8
Kiama	165	Gosford	60	Keira	25	Barwon	7
Newtown	164	Lakemba	59	Kogarah	25	Dubbo	7
Epping	144	Auburn	58	Mt Druitt	24	Upper Hunter	7
Summer Hill	131	Holsworthy	50	Albury	23	Cootamundra	9
North Shore	122	Campbelltown	47	Macquarie Field	23	Oxley	6
Hornsby	119	Blacktown	46	Port Macquarie	22	Murray	5
Drummoyne	115	Granville	45	The Entrance	37	Coffs Harbor	3
Heathcote	114	Penrith	43	Ryde	21	Lismore	1
Rockdale	113	Londonderry	41	Bega	19	Tweed	3
						Seven Hills	0
						Wagga Wagga	0
Subtotals	11,159		1,463		683		227
TOTAL SIGNATURES: 13,532							

Appendix 10 (b) NSW Electoral divisions petition analysis (by political affiliation)



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