Dive Industry
AR Perspective



Artificial Reef Uses

- Mitigation
- Shore Protection
- Scientific Studies
- Habitat Creation
- Conservation
- Economic Stimulus
- Diver Attractions

Barbados Study

- The Relationship between Diver Experience Levels and Perceptions of Attractiveness of Artificial Reefs - Examination of a Potential Management Tool
- Published July 23, 2013
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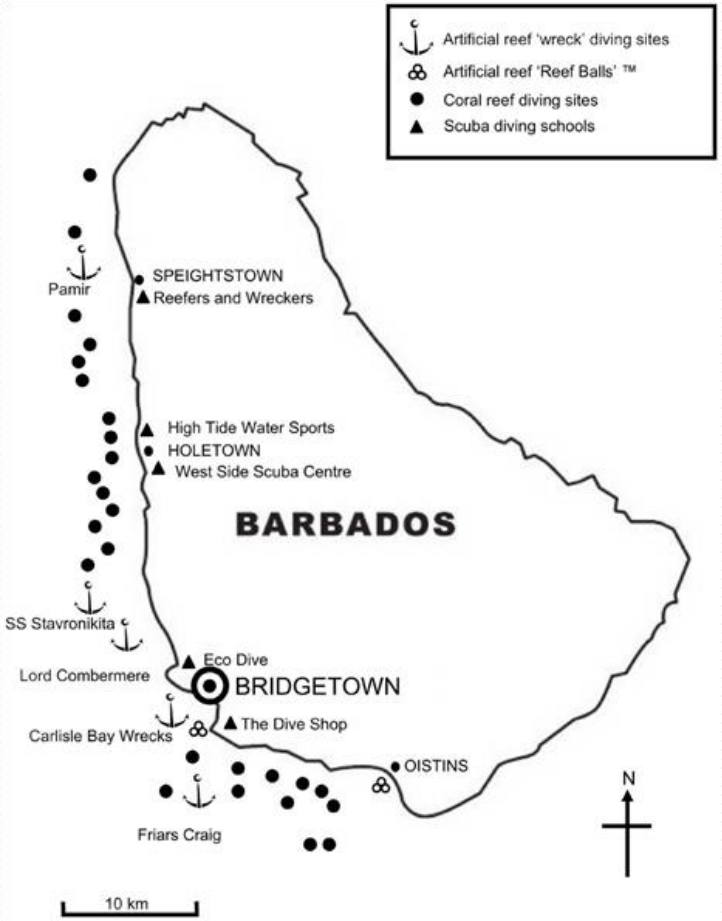
Perceptions

- The aim of this study was to explore the perceptions of diving on artificial reefs from a user perspective.
- Information was sought to characterize both resident and visitor scuba divers, to acquire an understanding of why individuals dive on artificial reefs, and the factors that inform their choice of dive site.
- Opinions, and preferences related to artificial reefs, including the environmental attributes and motivational factors that contribute to diver enjoyment were surveyed.



To complement the natural reefs, several artificial reefs consisting of shipwrecks and of Reef Balls have been gradually deployed along the south-west coast.

Barbados has an extensive collection of wrecks at various stages of maturity, six of which are situated in a dedicated marine park in Carlisle Bay.

Figure 1. Map of Barbados. Locations of artificial reef and natural reef diving sites and diving schools. doi:10.1371/journal.pone.0068899.g001

Diver Experience Levels

The diving experience of respondents was highly variable. A break down of diving qualifications held revealed:

- 66.5% possessed Open Water certification (basic and advanced level)
- 27% Sport or Dive Master qualifications.
- 5.5% Instructors
- 1% Trainee Divers

AR Awareness & Use

- 96% of Divers had heard of the term ‘artificial reef’.
- 95% of respondents reported having previously dived on what they considered artificial habitat.
- All 200 respondents had dived on artificial reefs in Barbados at some point.
- 20% of respondents stated they were influenced by established artificial reefs to visit Barbados.
- 76% participants had dived on wrecks while in Barbados.

Preferences

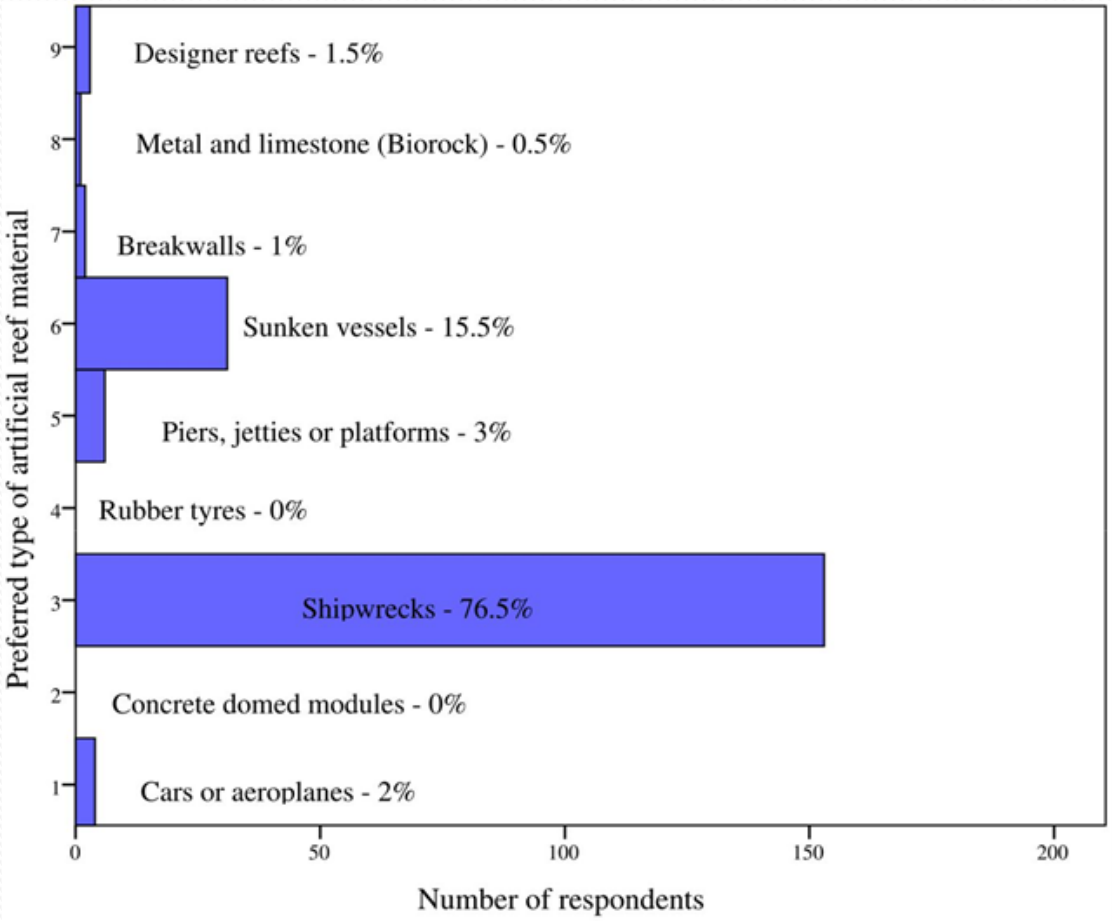


Figure 2. Respondents' preferences for type of artificial reef material. Sample size: n = 200. doi:10.1371/journal.pone.0068899.g002

AR Attributes Importance

Table 2. Ranked mean scores relating to the importance of artificial reef attributes for novice divers and experienced divers.

Overall rank	Novice divers (n = 104)		Experienced divers (n = 96)	
	Attribute	Mean score 61SD	Attribute	Mean score 61SD
1	Fish abundance	4.4960.64	Fish abundance	4.5160.68
2	Sea visibility	4.4460.75	Sea visibility	4.4060.77
3	Safety	4.2861.09	Coral cover	4.3860.74
4	Coral cover	4.1160.84	Safety	4.3260.97
5	Reef colors	4.0160.92	Mooring buoys	4.1260.98
6	Location/access	3.9860.81	Reef colors	4.0860.88
7	Mooring buoys	3.8861.06	Location/access	3.9660.86
8	Currents	3.7460.85	Currents	3.7260.86
9	Travel time	3.6160.93	Reef complexity	3.6260.85
10	Historic value	3.5461.06	Travel time	3.5961.03
11	Water depth	3.5161.05	Water depth	3.4661.09
12	Reef complexity	3.5060.96	Historic value	3.4461.09
13	Size of reef	3.3460.86	Size of reef	3.3460.92

Novice divers' ,100 logged dives, experienced divers' $100 logged dives.

Values measured on a 1–5 point Likert scale: 1 = not important at all, 2 = not important, 3 = average, 4 = important, 5 = very important. doi:10.1371/journal.pone.0068899.t002

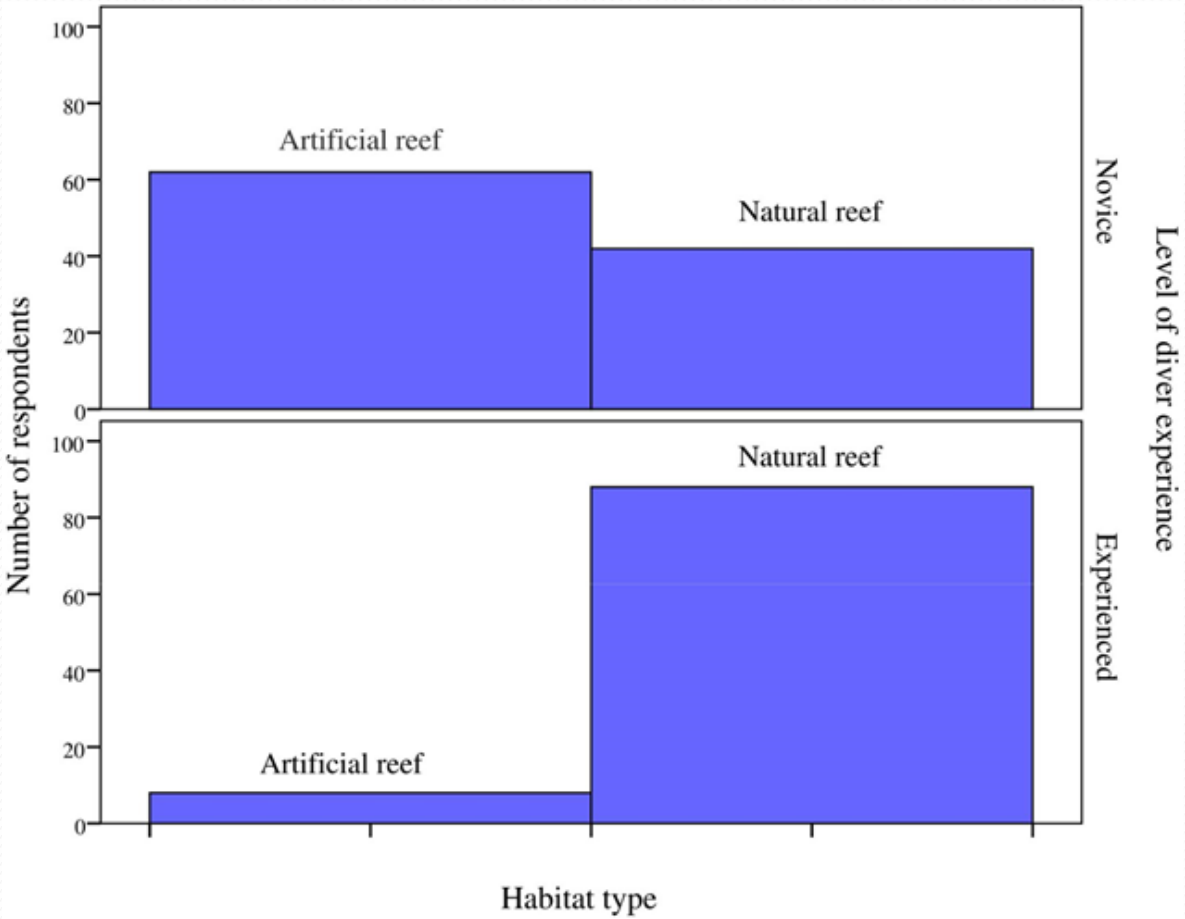
Table 3. Divers' ranked percentage agreement/disagreement to attitude statements concerning artificial reefs, with positively worded statements positioned at the top of the table, and values for the negatively worded statements below.

	*1	2	3	4	5	
Artificial reefs (AR)	(%)	(%)	(%)	(%)	(%)	Mean 1SD
Provide new habitat for organisms	0.0	0.5	6.5	37.0	56.0	4.496.64
Take diver pressure off natural reefs	1.5	2.5	15.0	44.5	36.5	4.126.86
Attract marine life divers wish to see	0.5	2.0	24.0	48.5	25.0	3.966.79
Suitable substitute for diving	1.5	8.0	15.5	53.0	22.0	3.866.90
Established AR are more interesting to dive	2.5	2.5	30.5	34.0	30.5	3.786.96
Form of marine visual pollution	41.5	44.0	9.0	4.0	1.5	1.806.87
Disruption to the local marine ecosystem	41.0	39.0	17.0	3.0	0.0	1.826.82
Too many AR in Barbados	27.0	42.0	26.5	4.0	0.5	2.096.86

*Values measured on a 1–5 point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree. Sample size: n = 200 for each attitude statement.

doi:10.1371/journal.pone.0068899.t003

Artificial Versus Natural Reef

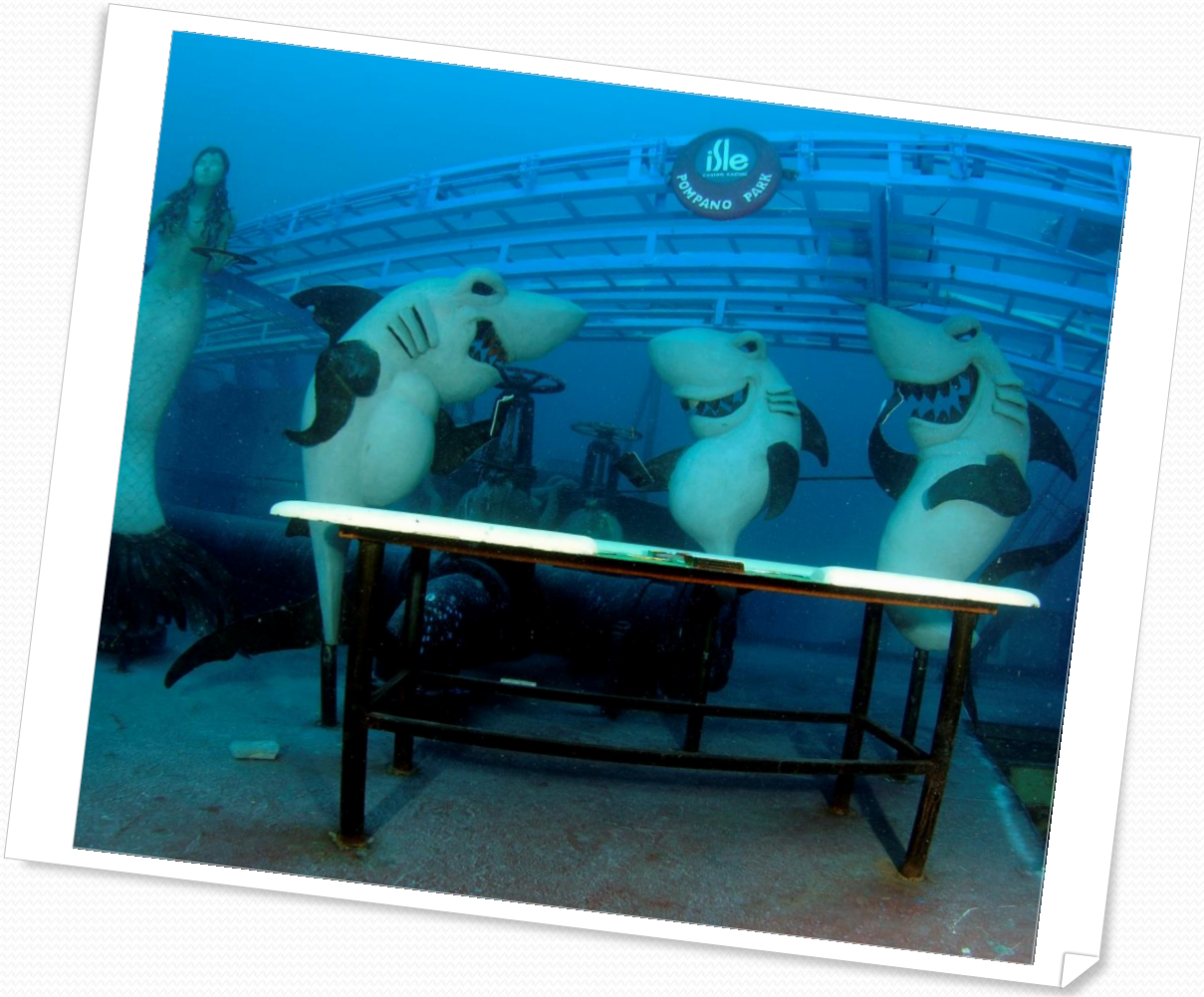


Conclusions

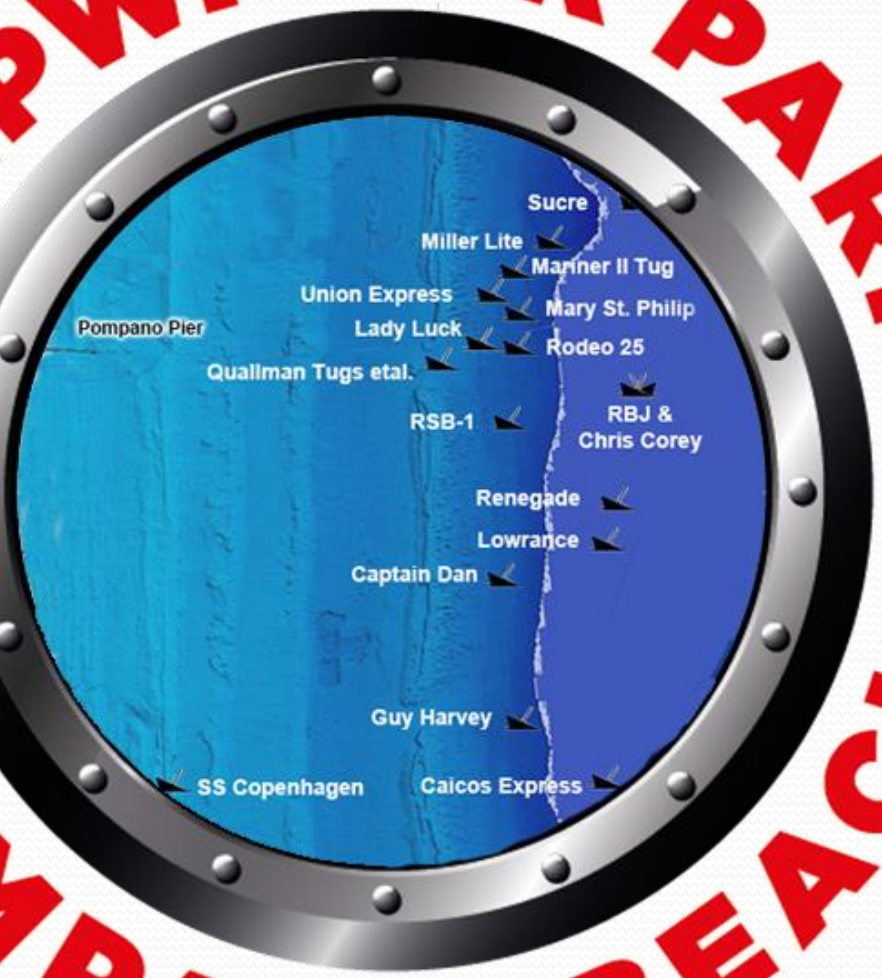
Motives for diving on artificial reefs were dominated by the reliability of the diving experience and associated biodiversity viewing and wildlife photographic opportunities.

Divers expressed a clear preference for themed diving experiences associated with large shipwrecks or sunken vessels.

The right kind of artificial reef reduces pressure on surrounding natural reefs.



SHIPWRECK PARK



POMPANO BEACH

The Shipwreck Park Pompano Inc.

The Shipwreck Park, Inc., a public charity and a registered 501(c) (3) formed to advocate for the preservation of the reef ecosystem and through the development of an underwater cultural arts park as a significant dive attraction. The project will include ongoing contributions to the artificial reef system with the expansion of sunken ships and rotating underwater art installations.

Lady Luck / Newtown Creek

- 324' Sludge Tanker from NY City
- Built in 1967
- Public & Private Partnership
- Center Piece for Shipwreck Park
- Artist Dennis McDonald
- Project completed in 82 days from leaving NYC to resting on the bottom July 23rd 2016!

Leaving New York

Arriving in Pompano Beach

First Inspection

Memorabilia

Art Work

Mermaid Waitress

Once a Polluter Now Giving Back